

**The Oxfordshire County Council (A40 Access to Witney)
Compulsory Purchase Order 2023**

**The Oxfordshire County Council (Highways Infrastructure – A40
Access to Witney) Side Roads Order 2023**

PLANNING INSPECTORATE REFERENCE:

DPI/U3100/23/25

**Proof of evidence of
Philippe Mohan Nirmalendran
(Highways and Traffic)**

INTRODUCTION AND QUALIFICATIONS

1.1 I am Philippe Mohan Nirmalendran, serving as the Technical Director for the Streets and Roads Department at AECOM UK & Ireland, and I have accumulated nearly three years of experience in this specific role at AECOM. I hold a Bachelor of Engineering (Honors) degree in Civil Engineering with Architecture, and I possess several professional certifications, including being a Chartered Member of the Institute of Civil Engineers, a Chartered Member of the Institute of Highway and Transportation, a Fellow Member of the Institute of Highway Engineers, and a Chartered Manager accreditation by the Chartered Management Institute.

1.2 With more than 20 years of experience in the highway engineering field, I specialise in the design and project management of complex highway and traffic engineering road infrastructure projects taking designs from preliminary to detailed design, both in the UK and internationally. I lead a team of specialists, including engineers, traffic modellers and environmentalists, who provide essential design support and expertise whilst overseeing and coordinating project delivery.

Scope of Evidence

1.3 This proof of evidence has been prepared regarding highway effects and highways traffic modelling matters relating to:

1.3.1 The Oxfordshire County Council (A40 Access to Witney) Compulsory Purchase Order 2023 (the **CPO**) [CDs A.1 and A.2]; and

1.3.2 The Oxfordshire County Council (Highways Infrastructure – A40 Access to Witney) Side Roads Order 2023) (the **SRO**) [CDs A.3 and A.4],

together the **Orders**.

1.4 The Orders were made to enable the delivery of improvements to the existing A40 Principal Road, the B4022 and the C16886 South Leigh Road at its junction with the B4022, at Shores Green, Witney at the location of the junction of the A40 with the B4022. The scheme is known as the A40 Access to Witney Scheme (the **Scheme**).

1.5 The Scheme will construct two new west-facing slip roads at the Shores Green junction of the A40; a new eastbound exit slip road from the A40 to a new junction with the B4022; and a new westbound entry slip road onto the A40 from a new junction with the B4022. The Scheme will provide new walking and cycling facilities on the B4022 within the A40 improvement works, which will improve provision for active travel.

1.6 The SRO will enable Oxfordshire County Council (the **Council**) to stop up highways and improve side road highways, in relation to the A40 Classified Road works comprising the improvement, by widening and other works, including the provision of two new west-facing slip roads, of the A40 Principal Road.

1.7 The Orders were made by the Council on 27 June 2023 and submitted electronically to the Secretary of State for Transport on 21 July 2023 and in hard copy on 1 August 2023. The Orders are now due to be considered by an Inspector at a Public Inquiry scheduled to open on 12 March 2024. This proof of evidence has been prepared in connection with that Inquiry.

1.8 The purpose of my evidence is to explain the approach and methodology taken to the design of the Scheme. I also explain the local junction traffic modelling work undertaken by the AECOM team that has taken place to support the design development of the Scheme.

1.9 My proof of evidence should be read in conjunction with other separate but interrelated proofs of evidence submitted on behalf of the Council, including:

1.9.1 Strategic Case and Need, prepared by Nicholas Blades of Oxfordshire County Council [CDs G.1, G.2 and G.3];

1.9.2 Environmental effects, prepared by Alison Morrissy of AECOM [CDs G.19, G.20 and G.21];

1.9.3 Planning policy, prepared by Baljinder Tiwana of Stantec [CDs G.10, G.11 and G.12];

- 1.9.4 Traffic Modelling, prepared by Theodore Genis of Stantec [CDs G.13, G.14 and G.15];
 - 1.9.5 Delivery and Funding, prepared by Gareth Slocombe of Oxfordshire County Council [CDs G.4, G.5 and G.6]; and
 - 1.9.6 Negotiations and Acquisition, prepared by Jessica Bere of Gately Hamer [CDs G.7, G.8 and G.9].
- 1.10 I confirm that the evidence that I have prepared in respect of this Inquiry is given in accordance with the guidance of my professional institution and I can confirm that the opinions expressed are my true and professional opinions.

2 SCHEME DESIGN

Summary of Option Assessment and Feasibility Study

- 2.1 During the Option Assessment and Feasibility Stage the approach to the Access to Witney study was based on and aligned with the Department for Transport's (DfT) Transport Appraisal Guidance (TAG) to evaluate each of the options. Ultimately, a TAG Options Appraisal Report was developed that considered a long list of potential options that was filtered to a short list before a comprehensive scoring evaluation was undertaken using a set of criteria that evaluates the potential effects of the Scheme, both positive and negative. The details of this are documented within the TAG report titled - **Access to Witney - TAG Options Appraisal Report Version 9** (Appendix 18 of the Statement of Reasons) [CD A.5] dated July 2021 and also detailed within Mr Nicholas Blades' Strategic Case and Need Proof of Evidence [CD G.2].
- 2.2 As part of the Feasibility Stage, 33 distinct options were initially evaluated qualitatively. This process aimed to narrow down the options to a shortlist that could then undergo quantitative assessment. These options were refined through a TAG compliant Options Appraisal Stage 1 and Stage 2 scoring and sifting process.
- 2.3 This section of my proof outlines the steps involved in the Option Assessment and Feasibility Stage, including the evaluation and assessment of a short list of options leading to the selection of the preferred Scheme. It also details the additional design work undertaken to enhance and refine the Scheme design.
- 2.4 The option assessment method conducted consisted of three stages.
- 2.4.1 Stage 1 is an initial assessment of the 33 long list of options identified, using high level criteria to sift out unviable/unsuitable options.
- 2.4.2 Stage 2 is a more detailed assessment of the shortlisted options from Stage 1, including an assessment based on the five-case business case approach (in line with DfT's Early Assessment Sifting Tool (EAST) approach).
- 2.4.3 Stage 3 is the final stage of assessment and focuses on refining the option or options identified in Stage 2 for further consideration, including exploring variations of the option, to lead to a preferred option.
- 2.5 The aim of the option assessment was to identify the better performing and feasible options which could then be taken forward for more detailed assessment / detailed design and modelling on those selected options. This was then taken forward for further work and consultation / stakeholder engagement, to help determine the preferred option, and to inform the development of an overall business case of the preferred option.

Long List Options Assessment

- 2.6 At the Feasibility Stage of the Scheme, AECOM carried out in **Stage 1: Initial Option Sifting** a comprehensive evaluation considering 33 options which are documented within the **Access to Witney - TAG Options Appraisal Report Version 9** (Appendix 18 of the Statement of Reasons) [CD A.5] - **Section 3, 4 and Section 5** with all 33 long list options tabled in a sifting exercise documented within in **Appendix C of that report**. The goal was to identify the most effective solution in meeting the objectives outlined by the Council. These 33 long list options encompassed modifications to highways (such as grade-separated and at-grade roundabouts, as well as adjustments to nearby roads in Witney), public transportation improvements (covering railways, trams, and Bus Rapid Transit), and interventions promoting active travel modes.
- 2.7 The available options were formulated through an examination of recognised challenges, considering existing or previously suggested solutions and analyses. Additionally, new solutions emerged through workshops and iterative processes within the study team, comprising both Council Officers and AECOM.
- 2.8 The benefits and potential issues for each of the 33 long list options were assessed and are documented on **pages 80 to 134 of 273** within **Access to Witney - TAG Options Appraisal Report Version 9** (Appendix 18 of the Statement of Reasons) [CD A.5].

- 2.9 Spatially, the options mainly fall into two broad categories with one set looking to make use of existing link capacity on the B4022 and another set looking to provide new or improved crossings over the River Windrush to supplement the existing Bridge Street crossing.
- 2.10 The 33 long list options were derived based on the assessment of current and forecast travel patterns, development and growth, and challenges; previous and current proposals from the relevant local authorities and stakeholders; workshops with Council officers; and professional judgement based on experience elsewhere and within Oxfordshire to provide a comprehensive list of options.
- 2.11 As part of the **Stage 1: Initial Option Sifting** the 33 options in the long list were assessed against the following initial sift criteria and a Scoring Summary of the Long list of Options is documented within **Table 5-1 page 139 to 149 of 273** of the **Access to Witney - TAG Options Appraisal Report Version 9** (Appendix 18 of the Statement of Reasons) [CD A.5].
- 2.11.1 **Objectives:** comparing the long list against the nine Access to Witney objectives.
- 2.11.2 **Affordability:** concentrates on the likely financial affordability of an option (its funding arrangements).
- 2.11.3 **Deliverability:** concentrates on the dependency of the option and interface risk in relation to other projects, timescale of delivery (construction and overall), and Compulsory Purchase Order (CPO) risks. Each of these were assessed to provide a rounded score.
- 2.11.4 **Acceptability:** considers stakeholder acceptability of an option including public acceptability, local authorities, delivery partners, statutory bodies, landowners and utility companies.
- 2.11.5 **Feasibility:** considers practical feasibility of an option in terms of engineering and complexity.
- 2.11.6 **Equalities:** considers potential impacts of each option on Protected Characteristic Groups (PCGs).
- 2.12 As documented within Appendix C of the **Access to Witney - TAG Options Appraisal Report Version 9** of the 33 long list of options, 28 options were discounted following the Stage 1: Initial Option Sifting assessment with five options taken forward for further design assessment. Those five options are listed below, and further details provided within the **Access to Witney - TAG Options Appraisal Report Version 9 section 5.3 page 150 to 152 of 273** (Appendix 18 of the Statement of Reasons) [CD A.5].
- 2.13 The **Stage 1: Initial Option Sifting** assessment showed the five better performing highway options as sub-options for Option 2 and Option 17.
- 2.13.1 Option 2A: West facing slip roads to provide access to/from the A40 at Shores Green - Conventional Arrangement
- 2.13.2 Option 2B: West facing slip roads to provide access to/from the A40 at Shores Green - Alternative Arrangement 1 (D-Link/Roundabout for On-Slip)
- 2.13.3 Option 2C: West facing slip roads to provide access to/from A40 at Shores Green – Alternative Arrangement 2 (D-Links On and Off-Slip)
- 2.13.4 Option 17: At-grade roundabout at Shores Green – option A.1
- 2.13.5 Option 17a: At-grade roundabout at Shores Green – option A.2

Short List Options Assessment

- 2.14 Following the initial high-level sifting of the options in Stage 1, this section summarises the **Stage 2 Appraisal Method and Results**, assessing and sifting the shortlisted options, the results of this process, and the recommendations that were taken forward. This relates to Step

- 7 in DfT's Transport Appraisal Process, namely, to develop and assess the potential options that were selected after the initial sift.
- 2.15 The five shortlisted options (Options 2A, 2B, 2C, 17 and 17a) were further assessed on the five case Business Case approach and a framework based on DfT's Early Assessment Sifting Tool (**EAST**) as part of the **Stage 2 Appraisal Method and Results**. The assessment was a qualitative appraisal of the five shortlisted options to identify the better performing and feasible option(s). These five shortlisted options and their assessments are documented within the summary **Table 6-1 on page 157 to 159** and also detailed in **Appendix D** of the **Access to Witney - TAG Options Appraisal Report Version 9** (Appendix 18 of the Statement of Reasons) [CD A.5].
 - 2.16 The framework used for the sift is summarised in **Section 6.2** of the **Access to Witney - TAG Options Appraisal Report Version 9**, and follows the criteria expected in an EAST assessment. A robust option selection process following DfT guidance was undertaken to ensure the shortlisted options represented the best way to meet the project objectives. The Stage 2 sift used a qualitative multi-criteria assessment based on the five point Business Case approach and used DfT's EAST (as stated on **page 153 to 156** of the **Access to Witney - TAG Options Appraisal Report Version 9**) (Appendix 18 of the Statement of Reasons) [CD A.5], to determine if there were any notable differences between the five shortlisted options or any showstoppers, so that only the better performing option(s) would be taken forward for more detailed assessment, design and modelling; or to help identify any common themes and issues within the options that might help refine them for further assessment and avoid having to test an extensive array of sub-options.
 - 2.17 This **Stage 2 Appraisal Method and Results** involved a more detailed assessment of the options than Stage 1, broadening the scope to consider key aspects of the strategic, economic, management, financial and commercial cases of each option. This was based on EAST, but adapted to suit the local context, key success criteria and key locally specific issues at Shores Green. As the five shortlisted options are all similar to each other, it was recognised that they would have similar scores, but specific local issues, if showstoppers, could help identify if an option could be sifted out; or if not, then these issues would help identify common themes to help limit the number of sub-options or variations that needed to be modelled for each of the three main options.
 - 2.18 The Do Minimum, for the current situation, which accounts for limited planned improvements into the future, but assumes that already committed developments (housing, employment, infrastructure), as documented within **Appendix G** of the **Access to Witney - TAG Options Appraisal Report Version 9** (Appendix 18 of the Statement of Reasons) [CD A.5] go ahead (in Business Case terms these would be categorised as 'Near Certain' or 'More than Likely') was also scored to provide a benchmark for assessing the options and a counterfactual against which to assess their effectiveness and help identify any biases in the scoring.
 - 2.19 The **Stage 2 Appraisal Method and Results** assessment indicated that the implementation of Option 2A, a grade separated west facing slip roads option, would provide the preferred way forward as this was the highest scoring. With Options 2B and 2C 2nd and 3rd. Details of this assessment are within **Appendix D** of the **Access to Witney - TAG Options Appraisal Report Version 9** (Appendix 18 of the Statement of Reasons) [CD A.5].
 - 2.20 It was noted that this would also provide consistency with the existing arrangement (grade separated east facing slip roads).
 - 2.21 Of these grade separated options, Option 2A performed best; however further detail is provided below comparing Option 2A to Options 2B and 2C related to land take and departures from standard to help reinforce these findings as documented within **Section 6.4** of the **Access to Witney - TAG Options Appraisal Report Version 9** (Appendix 18 of the Statement of Reasons) [CD A.5].
 - 2.22 Regarding Options 17 and 17A, these would require the removal of the current grade separated east facing slips and introduction of an at grade roundabout. However, the traffic modelling (as stated in technical note - **60611611 - Access to Witney - TNA02-D page 6 and page 7 of 27 within Appendix A.3** which is in the Transport Assessment within Appendix 7 of the Statement of Reasons) [CD A.5] indicates that the junction would perform worse than the slip roads and modelling predicts there would be significant queue formation and delays on the A40. It would

also introduce more conflict points between vehicles (with safety implications), there would still be a departure from standard and, in the case of Option 17a, land take would be required.

- 2.23 Post the further assessment of the five options in **Stage 2 Appraisal Method and Results** the following four options, 2B, 2C, 17 and 17a, were recommended to be sifted out.
- 2.24 Option 2A scored the highest and, based on discussion with the Council, was recommended for more detailed assessment and potential refinement. Overall, Option 2A was identified as the preferred way forward, based on the earlier analysis.

Preferred Option Identification

- 2.25 Following Stage 2 and the identification of Option 2A as the best performing option, the next stage of work commenced with the **Stage 3: Preferred Option** analysis which focused on additional development and refinement of Option 2A, including further modelling, design, road safety audit, preliminary ecological assessment and public consultation.
- 2.26 The Stage 3 sift involved the best performing option from Stage 2 (Option 2A) and underwent further design refinement and traffic modelling to develop sub-options and optimise the option as far as possible.
- 2.27 Nine sub-options for Option 2A (from Option 2A-A to Option 2A-I) were developed as part of Stage 3, with Design Manual for Roads and Bridges (DMRB) design standards used to develop the highway alignment designs for these nine sub-options. The nine sub-options for Option 2A were assessed to limit the options for modelling as documented within **Section 7.2.1 page 162 and 163** of the **Access to Witney - TAG Options Appraisal Report Version 9** (Appendix 18 of the Statement of Reasons) [CD A.5].
- 2.28 After engaging in conversations with adjacent landowners, the Council proposed the evaluation of roundabout alternatives through modelling. Although initially excluded from the longlist of potential options, Options 17, 17A, 18, 19, and 20A were later examined through modelling to assess their functional suitability.
- 2.29 All options listed in Table 1 below were taken forward for local junction traffic modelling as documented with the technical note - **60611611 - Access to Witney - TNA02-D** (Within appendix A.3 of appendix 7 of the Statement of Reasons) [CD A.5] along with Options previously discounted during Stage 1 as mentioned in section 2.28 above. The options were assessed in traffic modelling software LinSig (for Option 2A-G) and Junctions v9 (for Option 17, 17A, 18, 19, 20A, 2A-E, 2A-F, 2A-H, 2A-I) with 2031 forecast traffic flows taken from the A40 Corridor Strategic Highway Model.
- 2.30 From the traffic modelling it was observed that a few junctions were predicted to be overcapacity. The summary results of the options for the worst-case scenarios have been shown below.

Table 1. Summary and Conclusions of the traffic modelling results for those options are tabled below.

Table: Modelling Results Summary			
Option	Junction LOS	Residual Capacity (%)	Within Capacity?
Option 17	F	-	No
Option 17A	F	-	No
Option 18	F	-	No
Option 19	F	-	No
Option 20A	F	-	No
Option 2A-E	B	2%	Yes
Option 2A-F	A	10%	Yes
Option 2A-G	-	13.8%	Yes
Option 2A-H	F	-44%	No
Option 2A-I	F	-44%	No

- 2.31 The results in the table above summarise the modelling performance of the different options tested. It can be seen that the modelling predicts that majority of the junctions will be overcapacity against the predicted flows in 2031 as depicted by a Level of Service (LOS) of “F”. LOS of “F” indicates a forced or breakdown flow representing more demand in the junction than the physical capacity.
- 2.32 The West facing slip roads with signalised junction option (2A-G) performs the best in terms of spare capacity at 13.8% amongst all the options followed closely by Option 2A-F at 10% spare capacity. Option 2A-E is also just within capacity with 2% spare capacity left in the junction. All the remaining tested options are predicted to be overcapacity in 2031.
- 2.33 It was, therefore, recommended that Options 2A-E, 2A-F and 2A-G were considered further as they are predicted to be within capacity.
- 2.34 Three sub-options of Option 2A – ‘2A-E’, ‘2A-F’ and ‘2A-G’ – were further assessed to identify potential benefits and potential issues as detailed in **Table 7-1 to 7-3 on pages 172 to 176 of 273 of the Access to Witney - TAG Options Appraisal Report Version 9** (Appendix 18 of the Statement of Reasons) [CD A.5], whilst the other 2A sub-options ‘2A-A’, ‘2A-B’, ‘2A-C’, and ‘2A-D’ along with ‘2A-H’ and ‘2A-I’ were sifted out as documented within **Section 7.2.1 page 162 and 163 of the Access to Witney - TAG Options Appraisal Report Version 9** (Appendix 18 of the Statement of Reasons) [CD A.5].
- 2.35 As documented with **Appendix D of the Access to Witney - TAG Options Appraisal Report Version 9** (Appendix 18 of the Statement of Reasons) [CD A.5] the three sub-option scores are as per below, with Sub-Option 2A-G scoring the highest
- 2.35.1 Sub-option 2A-E scored ‘1’
- 2.35.2 Sub-option 2A-F scored ‘-8’
- 2.35.3 Sub-option 2A-G scored ‘3’
- 2.36 The options were further assessed in terms of Road Safety, ecology impacts and were presented at a Public Consultation to further reinforce the preferred Option as detailed below.

Road Safety in Stage 3

- 2.37 As part of the **Stage 3 Preferred Option** assessment, a Road Safety Audit (RSA) was undertaken for four options (Options 2A-E, 2B-B, 2C-B, 2A-F) early during the optioneering process. The audit comprised a review of the Scheme drawings, and a site visit in early September 2020 was conducted. This is detailed within **Section 7.3 Page 176 to 177 of the Access to Witney - TAG Options Appraisal Report Version 9** and further details of the RSA within **Appendix F of the Access to Witney - TAG Options Appraisal Report Version 9** (Appendix 18 of the Statement of Reasons) [CD A.5].
- 2.38 Overall, the RSA found some issues with the proposed option feasibility designs, such as roundabout sizes, which could lead to safety concerns. The RSA also recommended that street lighting be provided on all options. During the preliminary design phase in December 2021 a RSA was also carried out on Option 2A-G.

Preliminary Ecological Assessment in Stage 3

- 2.39 In addition, a Preliminary Ecological Assessment (PEA) was undertaken as part of the **Stage 3 Preferred Option** assessment 3. The PEA conducted an overall assessment of the Scheme without specifically evaluating individual options, and there is no indication in the PEA regarding a preference for any particular option.
- 2.40 The comprehensive findings from the PEA highlight the necessity of considering various impacts in subsequent preliminary design work and conducting more detailed impact assessments, as detailed in **Section 7.4.2 on page 178 of 273 of the Access to Witney - TAG Options Appraisal Report Version 9** (Appendix 18 of the Statement of Reasons) [CD A.5]. However, at this stage, none of these issues would be critical or uncommon for a project of this magnitude and scope in this particular location.

- 2.41 Once the preferred Scheme (Option 2A-G) was selected it was then taken forward into further design consideration and detailed assessment.

Summary of Public Consultation in Stage 3

- 2.42 Public consultation of the preferred sub-option 2A-G (based on its highest score) and the other two shortlisted sub-options (2A-E and 2A-F) was undertaken. In addition, the consultation listed the long list for comparison. The consultation was held in May and June 2021. As part of the consultation, virtual exhibitions and a webinar were held. Respondents were asked to complete a questionnaire concerning their views on the sub-options. Over 34 responses were received from organisations, councillors and individuals. Full details of the consultation are documented within the Councils **Access to Witney Engagement Report Appendix ref PN 3.1**.
- 2.43 The summary of results is documented within **Section 7.5 on page 179** of the **Access to Witney - TAG Options Appraisal Report Version 9** (Appendix 18 of the Statement of Reasons) [CD A.5].
- 2.44 Sub-option 2A-G received slightly higher support from respondents than 2A-E and 2A-F:
- 2.44.1 54% supported sub-option 2A-G, whilst 33% had concerns about the Scheme.
- 2.44.2 49% supported sub-option 2A-E/F, whilst 31% had concerns about the Scheme.

Summary to get to the preferred option

- 2.45 As detailed above the TAG Options Appraisal evaluation through Stages 1 to 3, coupled with additional traffic modelling, road safety assessment, Preliminary Ecological Assessment and public consultation, led to the selection of sub-option 2A-G to be advanced into a more detailed assessment and the preliminary design phase.
- 2.46 Sub-Option 2A-G was identified as the preferred option for further preliminary design and assessment primarily because of its anticipated lower land requirements and cost compared to alternative sub-options providing the Council with the most financially efficient solution. Junction modelling was conducted, revealing that it operates the best and within its capacity.
- 2.47 Once the preferred Scheme (Option 2A-G) was selected it was then taken forward into further design consideration and detailed assessment during the subsequent Preliminary Design Stage. The design standards and guidance used in the Preliminary Design Stage are detailed below.
- 2.48 During the Preliminary Design, clash detection has been carried out to limit constructability issues using 2D CAD models. To date only the highway alignment, geotechnical slopes and drainage attenuation ponds and ditches have been designed in 3D, so clash detection has been carried out by overlaying the DMRB series models of other disciplines (including, drainage, street lighting, utilities, landscaping, retaining walls, road restraint, fencing, and traffic signals) and identifying if any of the design models requires adjustments.

Surveys undertaken

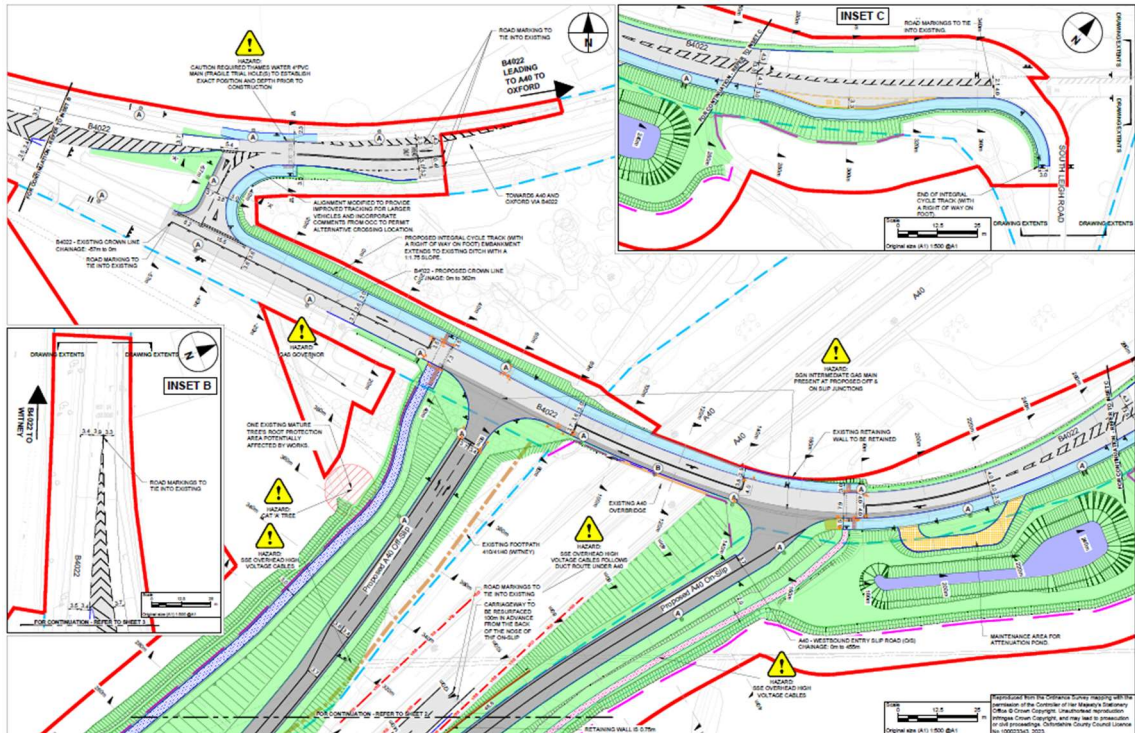
- 2.49 To inform the Preliminary Design stage the below survey information has been gathered.
- 2.49.1 3D topographical survey that was carried out in November 2020 and used as the base for the Preliminary Design with missing areas resurveyed in September 2021, and further updated topographical survey will be necessary for the Detailed Design stage.
- 2.49.2 A review of the collision data supplied by the Council dated between 1st January 2014 to 30th September 2019 indicates that no collisions on the A40 are related to these existing at the Shores Green and Ducklington lay-bys. Section 2.167 to 2.179 within this Proof of Evidence describes the further collision analysis that has been carried out for the Scheme.

- 2.49.3 GPR surveys carried on in September 2021 have been undertaken to locate existing statutory undertakers' apparatus along with further trial holes on the south western verge to accurately locate utilities
- 2.49.4 Ground Investigation has been undertaken, although it is still to be completed in certain specific locations. The data provided in respect of the areas that have been surveyed will be further reviewed in the Detailed Design stage.
- 2.49.5 Pavement surveys have been carried out between 1st and 3rd November 2021 as described in Section 2.163 within this Proof of Evidence.
- 2.49.6 Traffic Signs survey has been carried out through a site visit by AECOM Highways Engineers which was carried out on 26th November 2021 to review and measure all the signage located within the area impacted by the Scheme proposals.
- 2.49.7 Initial fieldwork for tree survey was undertaken on 16th March 2021 which identified a total of 72 tree features. An updated site visit was performed on 22nd December 2021 in relation to extended redline boundary areas, which identified a total of 15 additional tree features (numbered 73-87) as documented within the **Arboricultural Impact Assessment Report revision 00 dated 28th January 2022. Appendix ref PN 3.2**. In both instances dimensional data and observational information were collected and a diameter tape measure was used to measure stem diameters where feasible. The fieldwork informing this report has comprised a preliminary, non-intrusive, visual survey undertaken from ground level with the specific intention of evaluating the quality and benefits of trees on the Site. The survey was otherwise conducted in accordance with the requirements of BS5837.
- 2.49.8 As of now, ongoing archaeological trial trenching and geotechnical surveys are being conducted. These activities will gather further information for the Detailed Design phase.
- 2.49.9 Ecological surveys have been undertaken in August 2020 and completed in 2021 to understand the types of habitats and species present within the Scheme and the surrounding area. This this is further documented within Alison Morrissy's Environmental Matters Proof of Evidence [CDG.20]. Further ecology surveys are being undertaken to gather additional data.

Scheme Components

- 2.50 The slip roads form a signal-controlled T-junction connection with B4022. Both the junctions at the proposed A40 On-Slip and A40 Off-Slip have Toucan Crossings to provide Non-Motorised Users with a safe crossing facility.
- 2.51 The Scheme design is unable to provide a segregated cycle and pedestrian route along the B4022 due to insufficient available widths but does provide a LTN 1/20 compliant shared, cyclist and pedestrian use path, commencing from the junction of B4022 with the C16886 South Leigh Road and connecting to the existing shared path on the northern kerblines of (and within) the B4022. The section under the A40 overbridge is not LTN 1/20 compliant due to unavailability of adequate widths at the constraint section. The design layout has also resulted in the realignment of several existing PROWs located within the spread of the proposed embankments on both sides of the existing A40.
- 2.52 The Scheme design layout requires the removal of both the existing A40 eastbound and westbound lay-bys (shown in figure 1 below). The lay-bys have not been proposed to be reinstated elsewhere as part of the Scheme.

Figure 1. Scheme layout as shown on drawing reference 60611611-ACM-XX-XX-DR-HW-000109 to 111 Rev14 overleaf (Appendix 2 of the Statement of Reasons) [CD A.5].



Proposed Merge and Diverge Layouts

- 2.53 The proposed merge and diverge layouts have been reviewed taking guidance from **DMRB CD 122 Figure 3.12a and Figure 3.26a Appendix ref PN 3.3**, and plotting against the forecast 2031 traffic flows for the scenario which take into account the effect of all the A40 highway improvements.
- 2.54 Traffic flow data was obtained in Passenger Car Unit (**PCU**) for 2031 AM and PM peaks from the Strategic model as discussed in further detail in Theodore Genis's Proof of Evidence [CD G.14] and taken into the local junction traffic modelling. DMRB CD122 recommends the use of Vehicle per Hour (**VPH**). However, PCU data has been used to determine the layout of slip roads as the PCU counts are greater than VPH so will take into consideration a worst-case scenario.
- 2.55 Analysis of the predicted traffic flows against CD122 determined that "Layout A Option 01" layouts are used for both the proposed A40 Merge and Diverge layouts. **DMRB CD 122 Figure 3.30a Layout A Option 01 Appendix ref PN 3.4** is a single lane taper merge (on slip) and diverge (off slip) onto the existing A40 carriageway.

Proposed Merge and Diverge Alignment

- 2.56 The proposed A40 Diverge has been designed using a design speed of 120kph with a 150m long entry taper and a nose ratio of 1:15 making the total nosing length of 70m. The connector road has been designed as a slip road since it has a shorter length than 0.75km. As prescribed by DMRB CD 122, connector roads shall include a near straight at the back of the nose, at least equal in length to the nose which has been provided.
- 2.57 Following the back of the nose, the connector nose has been designed as a minor road with the design speed of 70kph up to the junction of the proposed Diverge with B4022. A 1020m curve radius has been designed on the proposed A40 Diverge which transitions into a 720m curve radius at the junction over a length of 17m.
- 2.58 A similar methodology has been adopted in the design of the proposed A40 Merge with the only difference being the nose ratio of 1:30 and a total nosing length of 85m. A 360m curve radius

has been designed on the proposed A40 Merge which transitions into a 1020m radius at the nosing over a transition length of 34m.

- 2.59 Both layouts comply with DMRB design standards with no departures.

Proposed B4022 Alignment

- 2.60 A superelevation of 5% has been designed on the B4022 to achieve the necessary horizontal alignment of a radius of 127m and to avoid additional land take. It has also been observed that the existing bend to the east of the existing A40 overbridge has a radius of 113m. This places it within the 90-150m criteria identified within DMRB CD109 and this requires the carriageway widths to be widened by 0.3m for both lanes. The required widening has been achieved at the existing bend with 4m wide lanes.

Departures from Standards

- 2.61 Whilst assessing the preferred Scheme option (2A-G) alignment three existing departures on the B4022 were identified, whilst the proposed Scheme alignment also introduces four new departures which were not able to be designed out. Those are listed below;
- 2.61.1 Visibility to the east of the controlled pedestrian crossing at the proposed A40 Diverge is being obscured by the A40 overbridge alignment. A maximum visibility of 103m can be achieved as opposed to the required 120m for a 40mph road. PROPOSED
- 2.61.2 Required stopping sight distance (**SSD**) cannot be achieved in the eastbound direction under the A40 overbridge. Maximum SSD of 80m can be achieved as opposed to the required 120m for a 40mph road. It should be noted that this departure exists currently on site. EXISTING
- 2.61.3 Visibility to the west of the controlled pedestrian crossing at the proposed A40 Merge is being obscured by the A40 overbridge alignment. A maximum visibility of 39m can be achieved as opposed to the required 120m for a 40mph road. PROPOSED
- 2.61.4 Required SSD cannot be achieved in the westbound direction under the A40 overbridge. Maximum SSD of 110m can be achieved as opposed to the required 120m for a 40mph road. It should be noted that this departure exists currently on site. EXISTING
- 2.61.5 The footway on the southern kerblines of B4022 under the A40 overbridge will have a substandard width of 1.1m. PROPOSED
- 2.61.6 Required SSD in the south-west direction cannot be achieved at the priority give-way link between B4022 and existing A40 Merge. Maximum SSD achieved of 35m as opposed to the required 120m for a 40mph road. It should be noted that this departure exists currently on site. EXISTING
- 2.61.7 Visibility to the east of the uncontrolled pedestrian crossing of 120m cannot be achieved on B4022. A maximum SSD of 85m can be achieved. PROPOSED
- 2.62 Departures from Standards **Appendix ref PN 3.5** are not considered to be significant for a project of this nature and were approved by the Council's Highways and Transportation Director on 1st July 2022. These are appended to this Proof of Evidence.

Shared Use Facilities Design

- 2.63 The Scheme design also proposes a compliant LTN1/20 shared use facility commencing from the junction of B4022 with the C16886 South Leigh Road and connecting to the existing facilities on the B4022 / existing A40 Merge.

- 2.64 The shared use facility is proposed to be 3m wide (based on projected cycle flows) with adequate provisions provided at the sections with vertical features to maintain the required effective width as mentioned in **DMRB CD 195 section E/3.2N Appendix ref PN 3.6**.
- 2.65 A variety of different options were considered for the shared use path under the A40 overbridge on the B4022 due to the narrow section and presence of the bridge structure.
- 2.66 The chosen option proposes compliant traffic lanes, a 1.13m wide south-western maintenance strip and 3.5m wide shared use facility on the northern eastern kerb. The south-western maintenance strip is proposed to be only used as a maintenance section and the proposed NMU route will not be provided a connection to it to prevent it from being used. The northern shared path proposes a 0.5m segregation strip from the carriageway due to the 40-mph speed limit according for DMRB CD 143 and a 0.5m clearance distance from the edge of the bridge abutment which results in an effective width of 2.5m under the A40 overbridge which is below the LTN1/20 Section 6.5.7 recommended width of 3.0m but is not a departure as per **DMRB CD 143 section E/3.5 Appendix ref PN 3.7** which identifies 2.0m as the minimum required where there are less than 200 users per hour.
- 2.67 In order to confirm the design option for the shared use path, a Walking Cycling and Horse-riding (**WCHAR Appendix ref PN 3.8**) survey was carried out on 17th August 2021 which recorded a total of 34 users travelling under the bridge towards Witney whereas 47 users were recorded travelling in the direction of South Leigh between 05:00-21:00. As the number of users were recorded to be extremely low, a 2.5m effective width facility has been deemed sufficient and meets the DMRB requirements.
- 2.68 A particular pinch point at the bridge abutment on the B4022 under the A40 overbridge is present. The pinch point results in overall width reduced to 2.5m with the effective width reduced to 2m due to the presence of a vertical feature over 600mm high (bridge abutment). Since the narrowing of the shared path is localised at a section and still results in a compliant 2m path as per DMRB CD 143 recommendations, it is not proposed to widen it further.
- 2.69 A cycle forecasting study was carried out using Department for Transport (**DfT**) Propensity to Cycle Tool (**PCT**) as detailed within the **Cycle Forecasting Report Appendix ref PN 3.9**. The study aimed to estimate the total number of cyclists using the underpass at the B4022 / A40. The worst-case scenario of high growth predicted a total demand of 91 cyclists in the AM and 138 cyclists in the PM peak.
- 2.70 This alongside an anticipated low number of pedestrians is expected to be lower than the 200 users per hour recommended by DMRB CD 143 to allow for a minimum of 2m shared use facility.

Traffic Modelling of the Preferred Scheme option (2A-G)

- 2.71 Traffic modelling was undertaken to inform the preliminary design of the preferred Scheme option 2A-G, and in particular to ensure adequate operational capacity was being provided at the proposed new A40 slip road junctions with the B4022. It was also undertaken to assess the impacts of the Scheme on a number of other junctions in the immediate local area around the Scheme.
- 2.72 The traffic modelling findings for the proposed new A40 / B4022 junction arrangement and these other local junctions is summarised briefly in this section and described in detail in **Section 7 and 8 of the Scheme Transport Assessment** (Appendix 7 of the Statement of Reasons [CD A.5]). The local junction modelling was undertaken using a VISSIM microsimulation model (and in some cases also with LinSig junction models). The models were developed using 2031 forecast traffic flows derived from the A40 Corridor Strategic Highway Model.
- 2.73 These local junction modelling tools were used alongside the A40 Corridor Strategic Highway Model which has provided forecasts of the impacts of the Scheme on traffic routing, flows, journey times and other network performance metrics across Witney and the wider A40 corridor road network (as described in the evidence presented by Mr Nicholas Blades of the Council) [CD G.2].
- 2.74 The Transport Assessment provided a number of conclusions based on this local junction traffic modelling which are summarised below:

- 2.74.1 Vissim modelling indicates that in 2031 the proposed new A40 / B4022 junction will operate with minimal queues and delay with the implementation of the Scheme - in both the AM and PM peak hours.
- 2.74.2 Stand-alone LinSig capacity assessments of the signal-controlled junctions at the junctions between the new A40 sliproads and the B4022 also indicate that they will operate within capacity in both peak hours.
- 2.74.3 Implementation of the Scheme will result in additional traffic using the B4022 / Jubilee Way / Cogges Hill Road junction. The Vissim model shows this results in a minor reduction in overall junction performance in 2031, but overall no significant increase in queues or delays at the junction. The Vissim modelling predicts that this junction would still operate within capacity in both peaks.
- 2.74.4 Implementation of the Scheme also results in a significant re-distribution of traffic flows through the A4095/B4022 double mini roundabout junction. The Vissim modelling shows this is forecast in 2031 to result in increases in queues and delays on some arms and reductions in others. Overall, the Vissim model predicts that the proposed Scheme will result in a reduction in congestion at the junction.
- 2.74.5 The capacity assessment of the Jubilee Way / A4095 priority junction indicates that there will be a limited detrimental impact in junction performance in 2031 with the implementation of the Scheme, with the junction predicted to operate marginally over capacity in the PM peak in 2031. The Council recognises it will need to monitor the performance of this junction (and the network more widely) once the Scheme is operational to consider if some mitigation is required.

Traffic Regulation Orders (TROs) and Temporary Traffic Regulation Orders (TTROs)

- 2.75 In this section I will address the TROs and TTROs requirements of the Scheme.
- 2.76 The Scheme will require the implementation of TROs to introduce new and amended speed limits, to prohibit or restrict parking and waiting of vehicles and to prohibit or restrict the loading and unloading of vehicles.
- 2.77 For the delivery of the Scheme, there will be a requirement for the implementation of TTROs to introduce temporary restrictions to speed limits, to prohibit or restrict parking and waiting of vehicles and to prohibit or restrict the loading and unloading of vehicles. The TTROs will be developed in conjunction with the Traffic Management Strategy that will be in place to ensure the safety of the delivery operatives, the road users, and members of the public.
- 2.78 In addition, TTROs will be required to temporarily prohibit use of the public Footpaths adjoining the A40 on its northwest and southeast side, during certain times of the Scheme construction period and until the permanent integral footways of the A40 improvement have been provided and are available to replace the Footpaths which are to be stopped up under the SRO.
- 2.79 In making its TTROs, the Council will have regard to the existence of alternative routes suitable for pedestrian traffic for the duration of the Scheme works, to ensure that a suitable, convenient and safe alternative route will be available during temporary closure periods and until the permanent Scheme works are complete.
- 2.80 The Traffic Management Strategy will include all required items of the TTRO, along with the prospective diversionary routes for all road users, including non-motorised users wishing to use the closed footways or Footpaths. The Traffic Management Strategy will be assessed by the Councils Highway Network Management Team and Accessibility Team, to ensure that it provides all the required mitigation to reduce impacts to all users. Alternative routes for Footpaths subject of temporary closure, will be advertised at the time the relevant TTRO is made, and appropriate signage placed on routes to direct pedestrians to alternatives during periods of closure.
- 2.81 The specifics of the TROs requirements will be developed through the detailed design phase once the exact commencement and termination point locations of the required restrictions or amendments are determined. Once details are finalised and the TROs are proposed to be

made, the proposed TROs will be advertised and during which period the public will have the opportunity to comment upon the TRO proposals before the Council determines if the TROs are to be made.

- 2.82 In summary, the need for the Council to implement TROs and TTROs for the construction and operation of its Scheme is recognised and the Council has a clearly defined process to ensure that the TROs and TTROs are in place and compliant prior to the introduction of any new, amended and temporary restrictions. Advertisement of the Orders for TRO's and TTRO's will be made at the right time and for the public to comment and make any representations to the proposed TROs.
- 2.83 The Council will ensure consideration is made for alternative routes to be available when proposing the temporary closure. The alternative route(s) will be published at the time of the advertising of the TTRO. If the TTRO is required to extend beyond 6 months due to construction phasing, the Council will plan and consider the absolute necessity of closure of the Footpaths for further periods and plans will be made in advance of the expiry period of the original TTRO for it to be extended.

Maintenance Lay-by on the B4022

- 2.84 The design proposes a maintenance lay-by on the B4022 located immediately to the east of the proposed A40 On-Slip. The lay-by will be collectively used to carry out maintenance activities on the proposed drainage attenuation pond and the traffic signal controller.
- 2.85 The maintenance lay-by has been proposed with left turn entry and left turn exit manoeuvres. The lay-by has been tracked with design vehicles of "FTA Design HG Rigid Vehicle" for drainage and a Van for traffic signal maintenance.

Maintenance Lay-by on the A40 eastbound

- 2.86 A further maintenance lay-by that is accessed from the A40 eastbound direction as shown on the General Arrangement plan Sheet 1 of 3 reference **60611611-ACM-XX-XX-DR-HW-000109 Rev14** (Appendix 2 of the Statement of Reasons) [CD A.5]. has been proposed that utilises the existing A40 eastbound layby which is located around 300m west from the proposed off slip road. This is proposed to be converted into a lay-by to be used to carry out maintenance activities on the drainage attenuation pond proposed within the extent of the A40 improvement and is not to be used for general parking and is therefore designed to only accommodate maintenance vehicles serving the attenuation pond.

Overview of A40 Laybys

- 2.87 As part of the Scheme a lay-by analysis was undertaken as documented within **Lay-By Review Report** within (Appendix 9 of the Statement of Reasons) [CD A.5], to understand the impact of the design on the existing lay-bys on A40 at Shores Green.
- 2.88 The proposed A40 On-slip road layout directly impacts the existing A40 Shores Green westbound lay-by, as the merge location conflicts with the existing lay-by location. The design therefore proposes to remove this lay-by as part of the proposed project with no replacement provided as part of the Scheme.
- 2.89 The existing A40 eastbound lay-by is located immediately to the west of the proposed A40 Off-slip road and conflicts with the need to provide Advance Directional Signs (ADS) for the proposed Off-Slip road. CD 169 specifically states that ADS signs should not be provided where a lay-by is present between the ADS and the Off-Slip road. This lay-by has been proposed to be removed as part of the proposed project to provide a compliant layout with no replacement provided.
- 2.90 A lay-by occupancy survey was carried out by Intelligent Data Collection Limited on behalf of the Council over two days. These were 17/09/2020 and 22/09/2020 for the Shores Green westbound lay-by and on 08/09/2020 and 09/09/2020 on the Shores Green eastbound lay-by for 24 hours.

- 2.91 Review of the data suggested that the westbound lay-by had the highest recorded parking instance of Cars (28) followed by Other Goods Vehicle 2 - OGV2 (22). OGV1 and OGV2 has the longest average parking durations recorded. The eastbound lay-by had the highest recorded parking instance of Cars (12) followed by OGV2 (6). Similarly, to the westbound lay-by, OGV1 has the long average parking duration followed by LGVs.
- 2.92 A review of the proposed strategy for the lay-by reinstatement was also carried out for Element 1 of the Scheme which commences at Hill Farm, which is situated approximately 1.4km to the east of Shores Green. The strategy suggested that two new Type A lay-bys are going to be reinstated to mitigate the removal of the lay-bys removed as a result of the Scheme.
- 2.93 The removal of the Shores Green lay-bys will result in the distance between the existing Ducklington lay-bys and the proposed lay-bys installed as part of A40 Smart Corridor exceeding the recommended distance of 2.5km (**ref CD 169 Table 2.2.4**) (Appendix PN 3.10) in both directions. The resulting distance would be approximately 3.5km between the Ducklington westbound lay-by and the proposed lay-by. The eastbound lay-by would be situated at approximately 5km to the east of Ducklington lay-by.
- 2.94 However, it should be noted that the requirement of the distance between the lay-bys is not a statutory or legislative requirement but is presented as an advice. Non-compliance with Table 2.24 of CD 169 would not represent a departure from standards.

Statutory Undertakers

- 2.95 In this section I will address how the Scheme is engaging with Statutory Undertakers. I will show the Scheme has consulted with the relevant Statutory Undertakers from an early stage and is following a process to either remove any impacts or implement diversions of Statutory Undertakers assets.
- 2.96 Review of the C2 information alongside the proposed Scheme design demonstrated that the following utilities would potentially be impacted, and so should be consulted further during Detailed Design stage:
- 2.96.1 Southern Gas Network (**SGN**) – Intermediate Pressure and Medium Pressure.
 - 2.96.2 British Telecom (**BT**).
 - 2.96.3 Thames Water (**TW**) – Main Distribution.
 - 2.96.4 Scottish and Southern Electric (**SSE**) – Overhead High Voltage Cables and Overhead Low Voltage Cables.
 - 2.96.5 Virgin Media (**VM**).
- 2.97 Following discussions with potentially affected utilities all but SSE and SGN have stated they are not affected by the proposed Scheme as the required safe distances have been established from their apparatus. Once in Detailed Design this will be further confirmed with unaffected utilities once again to ensure this remains the case prior to construction commencing.
- 2.98 The existing Gas Governor on the B4022 is a material design constraint. The Gas Governor is located approximately 100m to the west of the A40 overbridge over the B4022. It has been a specific Council request that the proposed design layout avoids impacting the Gas Governor and this has been maintained and will also do so through the Detailed Design.
- 2.99 AECOM have engaged with SGN through the New Roads and Streets Works Act 1991 (**NRSWA**) process to identify the location of their apparatus. By undertaking trial hole excavations, the locations in terms of line and level have been identified and assessed with the proposed design to determine if there are impacts. From these assessments and trial hole information it is evident that the depths are of sufficient cover that diversions are not required. The Council is continuing discussions with SGN through the Detailed Design stage to determine if protection of their asset is required and to what requirements and specifications. This will be completed prior to construction of the Scheme. An Asset Protection Agreement (APA) is in place with Southern Gas Network to assure the asset owner that the method statement for delivery

meets the requirements for protection of their asset. The terms of the APA were agreed between the Council and SGN on 12 February 2024 with SGN committing to removing their objection upon signature.

- 2.100 AECOM has also actively engaged with SSE to establish their apparatus that needs to be diverted as part of the main construction works through the **NRSA** process. Further discussions are required to detail the exact requirements and specifications with plans to divert the existing overhead Extra High Voltage 33Kv powerline that runs over the A40 and a High Voltage 11Kv that runs underneath the A40 into a ducted underground route via the proposed slip roads and B4022. Following the receipt of the C4 quote we will work with SSE to detail their requirements for diversions and designs will be completed prior to the start construction of the Scheme.

Overview of Drainage design – Attenuation ponds / Flooding

- 2.101 As detailed within **Lead Local Flood Authority (LLFA)** guidance document reference **Local Standards and Guidance for Surface Water Drainage on Major Development in Oxfordshire version 1.2 dated 14th December 2021**, the destination for offsite surface water runoff that is not collected for use should be prioritised in the following order:
- 2.101.1 Firstly, to infiltration/soakaway;
 - 2.101.2 Secondly, to a watercourse or highway ditch (with permission);
 - 2.101.3 Thirdly, to a surface water sewer or highway drain (with permission); and
 - 2.101.4 Lastly, to a combined sewer (with permission).
- 2.102 Based on the ground conditions infiltration is not a feasible option due to the presence of Oxford Clay, which is not free draining. Therefore, in accordance with the above hierarchy it is the aim for all runoff to be discharged to existing ordinary watercourses or main rivers.
- 2.103 The drainage strategy opted for the Scheme and agreed with the LLFA constitutes the use of filter drains to convey runoff from both proposed slip roads to an attenuation basin located to the east of the diverge with an intermediary carrier drain provided within the B4022 carriageway to convey runoff from the merge as well as the impacted section of the existing B4022 carriageway.
- 2.104 Consideration was given to the provision of separate attenuation basins for storm runoff onto the existing B4022 from each of the two proposed slip roads with the existing Limb Brook to the east as the final Scheme outfall. However, due to the presence of existing gas mains and gas governor to the west of the proposed diverge at its low point, this was discounted with required attenuation proposed to be consolidated to the east of the merge.
- 2.105 An additional attenuation (basin) has also been proposed to the southwest, adjacent to the A40 northbound carriageway and within the A40 improvement confines to cater for storm runoff from the proposed diverge which will drain onto the existing A40 northbound due to a highpoint midway of the proposed slip road. The highpoint at this location is dictated by the existing topography at the location. The location of the additional attenuation basin has been dictated by the existing topography and services. This basin has been designed to also attenuate existing flows from the A40 northbound carriageway helping alleviate observed flooding of the existing A40 to the south of the Scheme.
- 2.106 In addition to the above, it is proposed to provide ditches re-linking and connecting existing natural water courses which were cut off when the existing A40 was constructed decades ago to reroute the link road to the south of Witney away from its urban core. All existing highway ditches impacted by the Scheme are to be re-provided via diversions with redundant ditches retained where possible to minimise impact on the existing ecology.
- 2.107 The Scheme has a drainage strategy (documented within report reference 60611611-ACM-XX-XX-RP-CD-0001 **Drainage Strategy Report Rev2 dated 23rd March 2022**) (Appendix PN 3.11) and design that has been assessed, reviewed and agreed with the **LLFA**. The strategy does not propose any highway surface water runoff onto the surrounding land. A Flood Risk Assessment (**FRA**) (documented within report reference **60611611-ACM-XX-XX-RP-CD-0002**

Flood Risk Assessment Rev2 dated 23rd March 2022) (Appendix PN 3.12) has been completed (validated by hydraulic modelling) which demonstrates that the Scheme with the proposed drainage strategy will not increase the risk of flooding elsewhere, including on the land to the south of the proposed on-slip.

- 2.108 The proposed drainage strategy constitutes discharge of the Scheme related surface water runoff to local watercourses at restricted rates. Infiltration has been discounted as the existing ground is underlain by Oxford Clay, a poor infiltration medium. The primary point of discharge for the Scheme is the Limb Brook, an ordinary watercourse to the southeast of the Scheme. For the small sections of the proposed slips draining on to the existing A40, these will as with the existing A40, discharge to the Hardwick Brook located at the A40's low point approximately 0.5km south of the Scheme's southwestern extents.
- 2.109 The proposed drainage design makes use of filter drains to convey runoff from both proposed slip roads to an attenuation basin (Basin A) located on and within the improved B4022 to the east of the on-slip with an intermediary carrier drain provided within the B4022 carriageway to convey runoff from the on-slip as well as the impacted section of the existing B4022 carriageway. Consideration was given to the provision of separate attenuation basins for storm runoff onto the existing B4022 from each of the two proposed slip roads with the existing Limb Brook to the east as the final Scheme outfall. However, due to the presence of existing gas mains and gas governor to the west of the proposed off-slip at its low point, this was discounted with required attenuation proposed to be consolidated to the east of the on-slip.
- 2.110 Additional attenuation (Basin B) has also been proposed to the southwest, within the extent of the A40 improvement, adjacent to the A40 northeast bound carriageway. This is to cater for storm runoff from the proposed off-slip which will drain onto the existing A40 northeast bound carriageway due to a highpoint midway of the proposed slip road. The highpoint at this location is dictated by the existing topography at the location. The location of the additional attenuation basin has been dictated by the existing topography and services. This basin has been designed to also attenuate existing flows from the A40 northeast bound carriageway helping alleviate observed flooding of the existing A40 to the southwest of the Scheme.
- 2.111 For existing brownfield catchment areas on the A40 and B4022, the proposed drainage systems will discharge at the equivalent existing discharge rates with a minimum 40% reduction, while all new impermeable catchment areas will discharge at greenfield rates. Flows from the attenuation basins are to be restricted by flow control devices.
- 2.112 The greenfield rate (Qbar) per hectare calculated for the site is 4.32 l/s. Existing brownfield rates have been calculated using the modified rational method. Table 2.1 summarises the discharge rates for the proposed Scheme outfalls.

Table 2.1. Allowable Runoff Rates

Attenuation Reference	Total Impermeable Area (ha)	Greenfield Discharge Rate (l/s)	Existing Brownfield Discharge Rate (l/s)	Proposed Brownfield Discharge Rate - min 40% reduction (l/s)	Maximum Allowable Discharge Rate (l/s)
Basin A	1.060	2.69	146.16	58.46*	61.15
Basin B**	0.790	-	179.87	107.92	107.92
Filter Drain (A40 Southbound) **	0.195	-	54.34	32.61	32.61

**60% reduction on existing brownfield discharge rate proposed*

***Greenfield rate contribution not added to provide further betterment in comparison to existing conditions – flooding reported at the A40's low point to the south of the Scheme.*

- 2.113 The existing B4022 and sections of the A40 drainage system have no SuDS features, as surface water runoff currently discharges at unattenuated and unrestricted rates into the watercourses. The proposed drainage system will provide new SuDS features bringing some environmental benefit over the existing system including treatment of flows due to increased time for runoff to run across the proposed filter drains and attenuation basins. The planted nature of the attenuation basins will also provide increased biodiversity. The filter drains and basins will all provide improved water quality as they will help filter out and treat pollutants before being discharged to watercourses.
- 2.114 Attenuation volumes as well as the proposed drainage network have been modelled and tested using MicroDrainage and designed to accommodate the 1% annual exceedance probability (**AEP**) plus a 40% climate change event. Table 2.2 summarises the designed attenuation volumes and water levels.

Table 2.2 Attenuation Storage

Attenuation Reference	Calculated Storage Volume (m ³)	Design Volume (incl. 300mm Freeboard) m ³	Storage min (m)	Design Depth	Storage Provision Depth (m)
Basin A	525.068	980.612	0.794		1.303
Basin B	280.563	471.612	0.895		1.367
Filter Drain (A40 Southbound)	52.100	64.700	1.717		2.020

- 2.115 The attenuation basins have been designed to provide a minimum freeboard of 300mm. Due to proposed locations of the basins, any exceedance flows will discharge into adjacent watercourses without adverse impact on adjacent land and any nearby properties.

Overview of Street Lighting design

- 2.116 There is not currently any existing highway lighting equipment located in the area of the proposed extent of the Scheme, however it has been agreed with the Council's Lighting officers that minimal lighting should be provided, and the area lit to a conflict standard as outlined in BS:5489 to class C4.
- 2.117 All design areas for consideration such as the pedestrian/cycling crossing points and the cyclist and pedestrian shared use Cycle Track and footways fall within the conflict area extents so are all subject to the same lighting class. A total number of 19 lamp columns have been proposed within the Scheme extents.
- 2.118 The proposed lighting design generally consists of columns located in the verge at the back of the path where possible, with new LED luminaires. Columns have been positioned in a single sided arrangement on the south side of the carriageway to avoiding conflicts with the shared use Cycle Track and footway.
- 2.119 The proposed LED luminaires are proposed to be side entry mounted with 0.3m outreach brackets on 8m lighting columns for the junction extents along the B4022. Where the road passes under the A40 a single mounted luminaire will use a standard wall bracket which will be fitted at a height of 5m, the projection of the bracket will be up to a maximum length of 300mm.
- 2.120 All luminaires are to utilise a correlated colour temperature (**CCT**) of 3000K and fitted with 7 Pin NEMA with Westfire 7200 series photocell with a switching setting of 35/18 as agreed with the Council. Luminaires shall be dimmed to 75% output between the hours of 00:00 and 06:00.

- 2.121 It is intended that all proposed luminaires have a direct Distribution Network Operator (**DNO**) connection into the column. A DNO connected mini feeder pillar will be required to be located to the east of the underpass structure to provide a supply to the remote wall mounted unit, via a trunking system with 1.5mm 2 Arctic grade flex.

Overview of Traffic Signal design

- 2.122 The traffic signal control system is designed to facilitate both pedestrian and cycling movements. The design includes near-side signals and tactile indicators and audibles for visually impaired pedestrians.
- 2.123 It should be noted that the traffic signal design has been produced using UK and local Council standards and requirements from relevant design guidance taken from Traffic Signs Manual Chapter 6 and The Traffic Signs Regulations and General Directions 2016 (**TSRGD**).
- 2.124 The footway under the A40 overbridge is being improved / widened on the northern side, to allow for it to be provided instead as a shared pedestrian and cyclist use integral Cycle Track of the B4022. In order to maximise available space, all poles along this section have been designed as swan-neck type poles and will be installed closer to kerb.
- 2.125 Where swan-neck poles have been specified, adjacent signals have been placed on 4.25m poles to ensure all signals (red aspects specifically) on any one approach are at the same height.
- 2.126 Two traffic signal junctions have been proposed at the connection point of the proposed west facing slip roads with the B4022. They are in the form of signalised T-junctions approximately 150m apart. Toucan crossings have been proposed on the B4022 (east), in the On-slip junction and the B4022 (west), in the Off-slip junction.
- 2.127 The traffic signal junctions will be operated under a single controller with the On-slip and Off-Slip junctions operating as separate streams. The staging and phasing have been calculated and modelled as part of the preferred Scheme option.
- 2.128 To ensure the crossings operate efficiently, Microprocessor Optimised Vehicle Actuation (MOVA) detection method has been proposed at the site alongside the use of Kerbside and On-crossing detection. Safety audibles have been proposed to improve Non-Motorised User's safety.

Overview of Landscaping

- 2.129 The landscape design reflects the local landscape character with the creation of areas of native woodlands, native hedgerows and wildflower grassland.
- 2.130 These landscape elements provide valuable habitats for a range of flora and fauna as well as attractive visuals for both road and public footpath users.
- 2.131 The landscape design aims to re-establish any habitats lost during the construction stages, mitigate any damage, and provide new habitats along the A40 and proposed attenuation basins.
- 2.132 Evidence regarding assessment of visual impacts of the Scheme and benefits of proposed landscaping in mitigating adverse impacts is provided by Alison Morrissy of AECOM [CD G.20].

Speed Limit Review

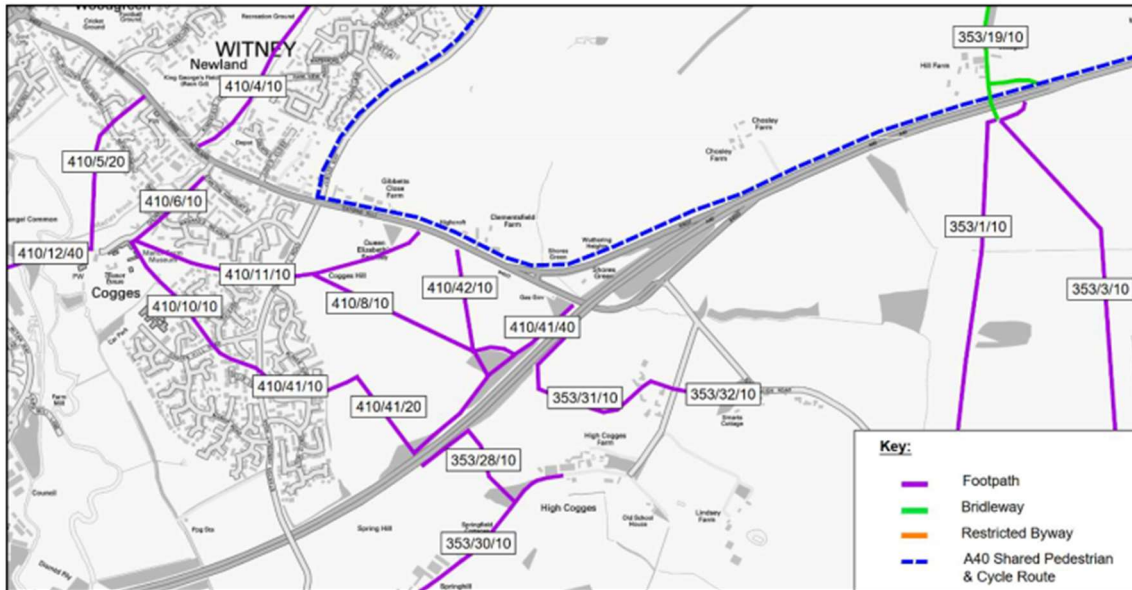
- 2.133 The existing layout comprises of a national speed limit of 60mph from the exit of the A40 dual carriageway (70mph) up to the Cogges Hill/Jubilee Way/B4022 junction, where the speed limit changes to 30mph.
- 2.134 Review of the existing layout suggested that there already exists a departure from standards, with the Stopping Sight Distances (**SSD**) being non-compliant with the prescribed requirement of 215m for the 120kph speed as per CD 109 'Table 2.10'. There exists substandard SSD at forward visibility under the A40 overbridge and at the priority give-way link between the B4022 and existing A40 On-Slip.

- 2.135 Therefore, the speed limit is proposed to be lowered to 40mph (70kph design speed) to help lower the SSD requirements from 215m to 120m and increase safety. The lower speed limit also results in a lower segregation strip requirement for the shared use path from the carriageway to 0.5m from a 2.0m for a national speed limit. This reduces the Scheme footprint particularly at the A40 overbridge constraint point.
- 2.136 The 40mph speed limit is proposed to commence from the junction of the B4022 with the C16886 South Leigh Road and existing A40 Off-Slip on to the B4022/Cogges Hill Road/Jubilee Way junction. The 40mph speed marker is to be located on the proposed A40 Off-Slip road at a section which would provide adequate stopping sight distance from A40 mainline and towards the signal junctions.
- 2.137 The 40mph zone extends up to approximately 230m to the east of the existing A40 On-Slip after which the speed reverts back to National Speed Limit.

Public Right of Way Modifications

- 2.138 A number of Public Rights of Way (**PRoW**), all Public Footpaths, have been identified in the vicinity of the Scheme as shown in Figure 2 below.
- 2.139 The west facing slip roads result in conflicts with Footpaths 410/41/20 (Witney), 410/42/20 (Witney), 410/8/20 (Witney), 410/41/30 (Witney), 410/41/40 (Witney), and 353/31/10 (South Leigh). The Footpaths concerned, where they are encroached upon and impacted by the extent of the improved/widened A40, would need to be stopped up.
- 2.140 Footpaths 410/41/20 (Witney), 410/41/30 (Witney) and 410/41/40 (Witney) will be replaced by an integral footway of and within the A40 improvement, located adjacent to the top of the proposed A40 Off-Slip cutting slope and running roughly in the same south west to north east direction as the existing Footpaths, but slightly north west of their current alignment. This integral footway will reconnect with the remaining length of Footpath 410/41/40 (Witney) in the south west and with the B4022 in the north east and remain connected with Footpaths 410/42/20 and 410/8/20 (Witney) which lie on the north west side of the A40. The integral footway of the A40 will be 3.0m wide and will be paved asphalt construction, to cater for pedestrian use only in the first instance, but be capable of converting to an integral shared use pedestrian and cyclist use Cycle Track, should any Cycle Track connection on its north western side be brought forward with future development proposals.
- 2.141 Footpath 353/31/10 (South Leigh) is similarly proposed to be stopped up where it falls within the extent of the improved/widened A40 and its proposed On Slip road. It will be replaced with an integral 2.0m wide footway which will run parallel and on the south east side of the top of the cutting slope of the proposed On Slip. The footway will be of sub-base type 1 material won from site excavations so that the footway blends in with neighbouring land.

Figure 2. Location of existing PRoWs



Geotechnical Review of the Scheme

- 2.142 Geotechnical reporting was undertaken in line with the DMRB CD 622 Managing Geotechnical Risk.
- 2.143 At project inception, a Statement of Intent (**SOI**) was produced which covered the Scheme extent and established an initial set of geotechnical risks following an initial review of readily available data.
- 2.144 A detailed desk study was subsequently carried out which enhanced the findings of the SOI and expanded on the geotechnical and geo-environmental risks for the Scheme. These risks are:
 - 2.144.1 Potential of unsuitability of site-won materials for re-use as earthwork fill
 - 2.144.2 Groundwater flooding has been identified as a low risk
 - 2.144.3 Potential constraints including mature trees and utilities
 - 2.144.4 Lateral variation in subgrade suitability across the Scheme
 - 2.144.5 Chemical attack on construction materials
 - 2.144.6 Slope instability
 - 2.144.7 Solid with significant volume change potential
 - 2.144.8 High compressibility and/or low bearing capacity solid at sub-grade or formation levels
- 2.145 Based on the proposed design and identified risks, a scope of ground investigation (**GI**) was identified, and a GI specification was produced.
- 2.146 As the ground investigation is yet to be fully completed, the current design was progressed based on available information with 1 in 3 embankment slopes.

Vehicle Restraint System

- 2.147 A Vehicle Restraint System (**VRS**) will be provided at the following locations for the following hazards as recommended by the Road Restraints Risk Assessment Process (**RRRAP**) and Local Area Risk Assessment (**LARA**) as documented within the **Road Restraint System Design Report** (Appendix PN 3.13).

- 2.147.1 A40 northbound mainline nearside verge: An approximate 60m extension of the existing barrier in advance of the parapet is required to protect the existing falling earthworks towards the slip. This section of earthworks is not impacted by the slip road, and the slip road in this location did not require protection (due to the distance from the mainline). This section of barrier will bring the existing mainline barrier into compliance with CD377 and RRRAP guidance.
 - 2.147.2 A40 northbound mainline nearside verge (South of diverge): The existing layby is being removed here and a RRRAP was completed. A section of N2 barrier is to be provided for the existing metal steps and for the final ADS for the diverge.
 - 2.147.3 A40 southbound mainline nearside verge: The existing barrier is to be extended by approximately 60m, this is to protect the slip road where the point of no return is in the direction of the slip road.
 - 2.147.4 A40 central reserve: Within the Scheme boundaries on the A40, there are presently two crossover points with openings in the central reserve. The crossover point that facilitates a connection between the public Footpaths (353/28/10 and 410/41/20) will be maintained adjacent to the proposed attenuation pond. However, the crossover point connecting the public Footpath (353/31/10 and 410/41/40) will be severed due to the alignment of the proposed On and Off slip roads. This measure is proposed to discourage users from crossing over embankments, both proposed On and Off slip roads, and the A40 mainline to gain access. The existing barrier is intended to be replaced with a suitable compliant system similar to the existing one. The connecting Footpaths at this point are to be stopped up and pedestrians will be provided with replacement footways within the extent of the A40 improvement which will take them to and from the B4022, to use its grade separately facilities to cross the A40 and continue their journey on remaining Footpaths on either the north west or south east side of the A40.
- 2.148 There were other hazards identified which would require VRS, however passively safe posts will be provided to remove the requirement for VRS. These are as follows:
- 2.148.1 The three countdown markers (TSRDG Dia. 823, 824 & 825) mounted on a single post on the approach to the northbound diverge.
 - 2.148.2 The first advance direction sign mounted on multiple posts on approach to the northbound diverge.
- 2.149 All hazards assessed on the B4022 did not require protection from VRS using the Local Area Risk Assessment (**LARA**) method.
- 2.150 The majority of hazards assessed on the northbound diverge where the speed limit is 40mph did not require protection from VRS using the LARA method C. However, these hazards did have the highest risk scoring, and there is the potential for drivers approaching these hazards to be travelling at higher speeds while travelling on the slip road. Because of this, it is proposed that spot hazards such as traffic signals, lighting columns and traffic signs be specified to have low energy poles, passively safe columns, and passively safe posts respectively. The lighting columns specifically in the nearside verge came out as a medium priority site for the protection of VRS. This means the provision of a RRS may be justified however, a non RRS approach to reducing the risk may prove sufficient to negate the need for an RRS. Therefore, it is proposed that the lighting columns are specified to have a passively safe columns or similar suitable systems approved by the Council, such as an octagonal column which in the event of a collision collapse in a manner that reduces the risk to road users.
- 2.151 It is proposed that all lit road furniture such as signal posts, lit signs and lighting columns that are not protected by RRS are to be fitted with an electrical disconnection system compliant with EN12767:2007.
- 2.152 The LARA indicated no requirement for VRS to cover the proposed attenuation pond within the B4022. In instances such as this the hazard is assessed in greater detail. It is considered that the fact that the pond's maximum depth is between 0.8m and 1m, the distance from the carriageway is significant and that the proposed speed limit is low, such that VRS is not required.

- 2.153 The provision of pedestrian guardrails has been considered for the Scheme. Due to the restrictive nature of pedestrian guardrails to pedestrian desire lines and the rural nature of the road it is deemed that guardrails are not required on any footway away from a crossing.

Traffic Signs

- 2.154 A number of traffic signs will be impacted by the proposed Scheme layout. New signage will be required to inform road users of the new destinations accessible due to the presence of the A40 new slip roads connecting to and from the B4022 and local highway network beyond. The planned reduction in the speed limit from National Speed Limit (60mph) to 40mph will also impact the sign sizes and locations.
- 2.155 A **Signing Strategy Report** (Appendix PN 3.14) was produced and submitted to the Council on 7th December 2021. The signing strategy outlines all the signs in the site and proposes if any additional signs are required.
- 2.156 Further to the signing strategy, a site visit was carried out on 26th November 2021 to review and measure all the signage located within the area impacted by the Scheme proposals. Some signs were measured to be over standard for the proposed speed limit to be enforced as part of the Scheme but were observed to be in good condition.
- 2.157 Following the Council's response to the Request For Information, the signs will be reviewed in Detailed Design stage on the Scheme to incorporate the Council's comments to reuse traffic signs that are in good condition.

Structures

- 2.158 On the proposed A40 Merge Layout, the design incorporates a short section of retaining wall between the slip road and A40 main carriageway. The Council have indicated that they are content to keep the retaining wall as it reduces the overall length of the slip road by a significant extent and has beneficial land acquisition impacts.
- 2.159 There are no other planned impacts to neighbouring existing retaining wall or bridge structures, including the A40 overbridge. The only interaction with the A40 overbridge will be mounting a street lighting head, bracket and cabling to lighting the B4022 under the bridge and re-marking the road markings on the A40.

Pavements

- 2.160 During the Preliminary Design stage, AECOM produced the pavement design in accordance with the Council's pavement design guidance, Reference - '**Carriageway Pavement Design and Surfacing Materials Guidance Note rev 2, April 2021 document**' (Appendix PN 3.15), and in conjunction with discussions held with the Council's Asset Management team on the design.
- 2.161 It should be noted that existing pavement data was requested and that this was received on 11th October 2021 for the B4022 only which informed elements of the design but did not provide sufficient information to determine the life of the existing pavement.
- 2.162 The AECOM pavement design was therefore produced on assumptions, envisaged Annual Average Daily Traffic (**AADT**) flows for the proposals and visual condition surveys of the existing carriageways and was submitted to the Council on 1st December 2021.
- 2.163 Subsequently pavement surveys were commissioned and completed on the 21st December 2021, where laboratory data, Compressive Strength, Waste Acceptance Criteria (**WAC**), Polynuclear Aromatic Hydrocarbons (**PAH**), Repeated Load Axial Test (**RLAT**) was then analysed, and information documented within the Pavement Design Evaluation Report ref "**A40 Access to Witney – Pavement Evaluation**" (Appendix PN 3.16), that was submitted to the Council on 10th January 2022.
- 2.164 The Pavement Design Evaluation Report suggested that assumptions made in the current pavement design requires small amendments to the pavement layers. These changes are

limited to the A40 where originally it stated to plane/replace 100mm, but following the receipt of the surveys, a 115mm plane/replace is required; for the B4022 where originally it stated plane/replace 100mm, it is now proposed to remove asphalt full depth to HBM (approx. 125mm) and lay a geotextile and replace with asphalt (i.e., approx. 125mm) to maintain existing levels. On this basis all new build designs remain consistent. These pavement design updates are to be incorporated into the detailed design stage.

Category A trees

- 2.165 There are several Category 'A' trees in the Scheme vicinity. The impact of the Scheme layout on the Category 'A' trees have been assessed. During detailed design the further evaluation and impact of Category 'A' trees will be carried out to propose alternative construction methods which will minimise the impact to Category 'A' trees where possible.
- 2.166 The Category 'A' tree in the vicinity of the Gas Governor will require alternative construction techniques to be followed to avoid impacting its Root Protection Area (**RPA**).

Collision analysis

- 2.167 The collision analysis has been undertaken based on the data provided to AECOM from the Council to aid the Preliminary Design.
- 2.168 Comparison has been carried out for the Shores Green collision data against the National Average data for England for the years 2014 to 2019 to ensure consistency is maintained.
- 2.169 The national average data has been filtered by light conditions, weather conditions, road surface, special conditions at site, fatal or serious, road user type, road user by casualty class and casualty age.
- 2.170 The collisions occurring at Shores Green and A40 between 01/01/2014 and 31/05/2021 have been analysed to determine the likely causes of the incidents. Comparisons have been made with the national average where necessary to understand the trends.
- 2.171 The study found out that there was a total of fifteen collisions occurring in the timeframe with three serious injury collisions and the remaining slight injury with no fatalities reported.
- 2.172 The majority of the collisions involved a car (68%) followed by those involving pedal cycles (14%) and those involving powered two wheelers (11%). No recorded collisions involved a pedestrian or horse rider within the study area.
- 2.173 The collisions were spread fairly evenly though the days of the week with Friday accounting for the highest number of four collisions. Six (40%) out of the total fifteen collisions occurred during the morning and evening peak hour followed by an even spread of the remaining incidents throughout the day. Collisions were recorded to be predominantly occurring during the first half of the year, with April accounting for the highest of four collisions.
- 2.174 'Failed to look properly' was recorded to be the most common causation factor accounting for 5 collisions. 'Careless/reckless/in a hurry' and 'poor turn or manoeuvre' were the next highest contributory factors with four collisions each.
- 2.175 The age profile of the casualties was recorded to be similar to the national average with adults aged between 18-59 years accounting for 80% of all casualties.
- 2.176 The majority (53%) of the collisions occurred with a 'dry' road surface whereas the remaining (47%) of the collisions occurred with a 'wet/damp' road surface condition which might indicate that the existing drainage facilities and/or the existing road texture would need to be investigated.
- 2.177 A high number of collisions was recorded to be occurring during daylight conditions which shows that lighting conditions at the site are not a major concern.

- 2.178 A cluster site was identified which accounted for five out of the total fifteen collisions. The site is located at the junction of B4022 with the existing A40 On-slip. Further analysis of the cluster site demonstrated that the majority of the collisions involved behavioural factors with 'failed to look properly' being the most common cause.
- 2.179 It is anticipated that the planned reduction of the speed limit will reduce the severity of the collisions occurring at the cluster site, whilst the signalised crossings and shared use path alongside the B4022 which will provide safer facilities for vulnerable road users.

Road Safety Audit

- 2.180 A Stage 1 road safety audit was carried out on the final preliminary design by an independent AECOM Audit team on Thursday 11th November 2021 shown in the **Roads Safety Audit document** (Appendix PN 3.17). The following items were raised by the Audit team following the review of the proposed Scheme design and the site visit:
- 2.180.1 Problem 1: The provision of the diverge for the eastbound off slip and the merge for the westbound on slip requires the removal of existing eastbound and westbound lay-bys on the A40.
- 2.180.2 Problem 2: The attenuation pond on the northern side of the A40 behind the maintenance lay-by is exposed with the risk of an errant vehicle that leaves the carriageway at this point entering the pond.
- 2.180.3 Problem 3: The width of the two-way link road between the A40 eastbound on slip and the T-junction with the B4022 could leave opposing vehicles on the link more susceptible to coming into conflict with one another.
- 2.180.4 Problem 4: The proposals for the A40 eastbound on slip junction with B4022 appear to create a reverse curve in the eastbound traffic lane, which could increase the risk of loss of control type collisions occurring.
- 2.180.5 Problem 5: There is no indication of where the proposed 40mph speed limit for the new road layout will commence.
- 2.180.6 Problem 6: The provision of the solid line/broken line road markings past the A40 on slip T- junction leaves a vehicle attempting to overtake vulnerable to conflict with a vehicle turning left towards South Leigh Road.
- 2.180.7 Problem 7: The proposed street lighting does not extend to the B4022 westbound bus stop or the junction with South Leigh Road which could leave those vehicles turning on the junction more vulnerable to conflict with one another during the hours of darkness.
- 2.181 The Designer's response to the road safety audit has been provided, document reference **Access to Witney – Road Safety Audit Stage 1 Designer's Response** (Appendix PN 3.18). Four recommendations have been accepted, two partly accepted, and one rejected. The response has been submitted to the Council for review and approval. The Council provided their approval to the Road Safety Audit Stage 1 Designer's Response on 19th April 2022.

Consultation and Engagement

- 2.182 As outlined in the aforementioned section 2.42 to 2.44, a public consultation has been carried out. In addition to that, to assist in the Preliminary Design stage, there has been engagement with the following stakeholders throughout this stage, and this engagement will persist into the Detailed Design phase:
- 2.182.1 The adjacent A40 Smart Corridor project team,
- 2.182.2 South Leigh and High Cogges Parish Council,
- 2.182.3 Utilities companies, as detailed in section 2.95 to 2.100,

- 2.182.4 The Council's Street Lighting department,
 - 2.182.5 the Council's Asset Management for drainage and pavement,
 - 2.182.6 the Council's Biodiversity Officer,
 - 2.182.7 the Council's Archaeology Officer,
 - 2.182.8 the Council's Archaeological Services,
 - 2.182.9 the Council's Landscape Officer,
 - 2.182.10 the Council's Rights of Way Officer,
 - 2.182.11 Lead Local Flood Authorities,
 - 2.182.12 Natural England,
 - 2.182.13 Adjacent Landowners,
 - 2.182.14 Adjacent Developers (EWSDA),
 - 2.182.15 Bus companies including Stagecoach,
 - 2.182.16 Windrush Bike Project ,
 - 2.182.17 Thames Valley Police,
 - 2.182.18 Road Haulage Association.
- 2.183 Following Consultation and Engagement, a number of changes were proposed as detailed in Paragraph 7.21 of the Statement of Case [CD A.6]. These are summarised as per below;
- 2.183.1 Modifications made to the horizontal design for visibility requirements, lane widths and shared use provision.
 - 2.183.2 Horizontal and vertical alignments of the B4022 for a more compliant layout.
 - 2.183.3 Existing B4022 junction with the existing A40 on-slip road was modified following swept path analysis.
 - 2.183.4 Level difference between the existing A40 and the proposed diverge layout, where the off-slip road rises and increases to around 2m in height.
 - 2.183.5 Small attenuation pond has been designed to control this flow, located alongside the existing eastbound layby around 230m from the start of the nosing of the proposed off-slip road.

Design Assurance

- 2.184 As part of AECOM's procedures, a review, check and approval process is carried out on all deliverables by appropriately qualified and experienced staff prior to issuing to ensure technical quality, correctness and accuracy is maintained.
- 2.185 The design components have gone through a variety of checks to ensure the design is safe, complies with best practice and meets the required standards where possible, including swept path analysis using HGVs to ensure vehicle movements are safe and do not risk traffic; pavement assessments to ensure proposed depths are suitable for the envisaged traffic; visibility splay checks to ensure traffic signs, traffic signal, and crossing points along with maintenance layby and junction manoeuvres are all safe and do not pose risks to users. Additionally, a RRRAP assessment is undertaken to determine locations of VRS for protection.

- 2.186 During the process of designing the preferred Scheme option (2A-G), the Council's Technical Assurance Authority have reviewed and commented on each of the Preliminary Design deliverables, providing comments and subsequently approvals once documents have been updated for each of the deliverables that make up the Preliminary Design stage. This design assurance will continue during the Detailed Design stage.

Design Standards and Guidance used during the Preliminary Design Stage

- 2.187 During the feasibility stage and preliminary design development AECOM have used a number of DMRB standards, as listed below.
- 2.187.1 DMRB CD 127 – Cross-sections and Headrooms.
 - 2.187.2 DMRB CD 109 – Highway Link Design.
 - 2.187.3 DMRB CD 195 – Designing for Cycle Traffic.
 - 2.187.4 DMRB CD 122 – Geometric Design of Grade Separated Junctions.
 - 2.187.5 DMRB CD 123 – Geometric Design of At-grade Priority and Signal-controlled Junctions.
 - 2.187.6 DMRB CD 143 – Designing for Walking, Cycling and Horse-riding.
 - 2.187.7 DMRB CD 169 – The Design of Lay-bys.
 - 2.187.8 DMRB CD 224 – Traffic Assessment
 - 2.187.9 DMRB CD 225 – Design for New Pavement Foundations
 - 2.187.10 DMRB CD 226 – Design for New Pavement Construction
 - 2.187.11 DMRB CD 227 – Design for Pavement Maintenance
 - 2.187.12 DMRB CS 228 – Skidding Resistance
 - 2.187.13 DMRB CD 239 – Footway and Cycleway Pavement Design
 - 2.187.14 DMRB CD 377 – Requirements for road restraint systems
 - 2.187.15 DMRB CG 501 – Design of highway drainage systems
 - 2.187.16 DMRB CD 521 – Hydraulic design of road edge surface water channels and outlets
 - 2.187.17 DMRB CD 522 – Drainage of runoff from natural catchments
 - 2.187.18 DMRB CD 524 – Edge of pavement details
 - 2.187.19 DMRB CD 525 – Design of combined surface and sub-surface drains and management of stone scatter
 - 2.187.20 DMRB CD 526 – Spacing of road gullies
 - 2.187.21 DMRB CD 529 – Design of outfall and culvert details
 - 2.187.22 DMRB CD 532 – Vegetated drainage systems for highway runoff
 - 2.187.23 DMRB CD 533 – Determination of pipe and bedding combinations for drainage works
 - 2.187.24 DMRB CD 534 – Chamber tops and gully tops for road drainage and services
 - 2.187.25 The Traffic Signs and Regulations and General Directions (TSRGD) 2016

- 2.187.26 Traffic Signs Manual Chapters 1,3,4,5,6 and 7
- 2.188 Along with guidance documents as listed below:
- 2.188.1 DfT Inclusive Mobility
 - 2.188.2 LTN 1/20 – Cycle Infrastructure Design
 - 2.188.3 The Council's Walking and Cycling Design Guidance
 - 2.188.4 Local Standards and Guidance for Surface Water Drainage on Major Development in Oxfordshire (November 2018)
 - 2.188.5 CIRIA C753 The SuDs Manual (2015)
 - 2.188.6 Highways Agency (2016) SHW, 'Manual of Contract Documents for Highway Works, Volume1 Specification for Highway Works, Series 600 Earthworks'
 - 2.188.7 British Standards Institution (2004) BS EN 1997-1:2004 Eurocode 7: Geotechnical design. General rules (incorporating corrigendum February 2009). London, BSI.
 - 2.188.8 British Standards Institution (2007a) BS EN 1997-2:2007 Eurocode 7: Geotechnical design. Ground investigation and testing (incorporating corrigendum June 2010). London, BSI.
 - 2.188.9 British Standards Institution (2015) BS 6031:2009 Code of practice for earthworks earth retaining structures. London, BSI.
 - 2.188.10 British Standards Institution (2015) BS 8002:2015 Code of practice for earth retaining structures. London, BSI.
- 2.189 During the Preliminary Design work, clash detection has been carried out to limit constructability issues using 2D CAD models. To date only the highway alignment, geotechnical slopes, drainage attenuation ponds and ditches have been designed in 3D, so clash detection has been carried out by overlaying the DMRB series models of other disciplines (including drainage, street lighting, utilities, landscaping, retaining walls, road restraint, fencing, and traffic signals) and identifying if any of the design models requires adjustments. This technique will assist during Detailed Design whilst also giving confidence in the design that has been presented as part of the Planning Application and Orders.
- 2.190 An ECI Contractor conducted a positive evaluation, and an external review of the existing Preliminary Design was undertaken. This review confirmed the presence of sufficient working space within the required land for constructing the Scheme, and no anticipated buildability issues were identified.
- 2.191 During Detailed Design the Scheme will undergo value engineering to ascertain if further construction savings and costs can be made. The detailed design will be of sufficient level to discharge the planning conditions whilst also providing sufficient information for the selected Contractor to build the Scheme safely and efficiently.

3 NEED FOR AND EXPLANATION OF THE SIDE ROADS ORDER (SRO)

Need for the SRO

- 3.1 The Council has made the SRO under Section 14 of the Highways Act 1980 in relation to the Classified Road works of the A40 Principal Road improvement.

The Classified Road Works

- 3.2 Those Classified Road works comprise the improvement, by widening and other works, of the A40 Principal Road from a point on the south west side of the A40 overbridge crossing of the B4022, at South Leigh, south westwards for a distance of approximately 775 metres, and incorporating the construction of a new eastbound exit slip road, from a point on the existing A40 approximately 520 metres south west of the A40 overbridge crossing of the B4022, north eastwards to its junction with the B4022 and a new westbound entry slip road, from its junction with the B4022, south westwards to its junction with the A40, at a point approximately 280 metres south west of the A40 overbridge crossing of the B4022.
- 3.3 The Classified Road works will also incorporate:
- (a) an integral Footway for pedestrians, running along the top of the north west cutting slope of its eastbound exit slip road, connecting to Footpath 410/41/20 (Witney) at a point at the new A40 boundary just to the north east of the new attenuation pond (on the opposite side of the A40 to Footpath 353/28/10 (South Leigh)). The integral Footway provision will allow for pedestrian connections with the existing Footpaths network on the north west side of the A40 and with the B4022. The new Footway will be 3m in width to allow it to be converted to a shared use Cycle Track in the future in line with Council aspirations set out in the **Witney Local Cycling and Walking Improvement Plan (LCWIP) – adopted in March 2023** (Appendix 6 of the Statement of Reasons) [CD A.5].
 - (b) an integral Footway for pedestrians, running along the top of the south east cutting slope of its westbound entry slip road, connecting to the integral Cycle Track with a right of way on foot on the southern side of the B4022 and Footpath 353/31/10 (South Leigh) to the south west.

The Authority which the SRO would provide, if confirmed

- 3.4 The SRO would, if confirmed by the Secretary of State for Transport, facilitate the delivery of the Scheme by authorising the stopping up of highways (Footpaths) which cross or enter the extent of the A40 Principal Road improvement works, as well as other necessary and associated highway works to highways adjacent to the A40 Principal Road improvement. The extent of the SRO provisions comprise of the following.

(a) **The Stopping Up of Highways-**

On the North-West side of the existing A40

- (i) of the whole of two Footpaths, Footpaths 410/41/30 (Witney) and 410/41/40 (Witney) marked S2 and S3, respectively, on the SRO Site Plan, and of lengths of three other Footpaths, Footpath 410/41/20 (Witney), 410/42/20 (Witney) and 410/8/20 (Witney), marked S1, S4 and S5, respectively, on the SRO Site Plan; and

On the South-East side of the existing A40

- (ii) a length of Footpath 353/31/10 (South Leigh),

all where they are encroached upon and absorbed within the projected improved and widened A40 Principal Road and as are shown by zebra hatching on the SRO Site Plan and referenced S1 – S6, as described above.

(b) **The Improvement of Highways –**

B4022 Oxford Hill
B4022
C16886 South Leigh Road
Footpath 410/8/20 (Witney)
Footpath 410/42/20 (Witney)

where they adjoin the A40 Principal Road works, over the areas which are shown by cross hatching on the SRO Site Plan.

The Nature of Works of the Highways to be Improved under the SRO

Footpaths

- 3.5 Short lengths of Footpaths 410/42/20 and 410/8/20 (Witney) will be improved to provide a tie in, and an appropriate means of crossing of a drainage ditch, to connect with the A40 integral Footway, on its north west side, taking pedestrians to continue their journey on that Footway to connect with the B4022 to the north east, and Footpath 410/41/20 (Witney) to the south west.

The B4022 and C16886 South Leigh Road

- 3.6 The B4022 will be improved to provide a length of integral Cycle Track, for cyclist and pedestrian use, on its southern side, between the C16886 South Leigh Road and the east side of the new westbound entry slip road, where there will be a new crossing point provided onto the north side of the B4022. A new integral Footway of the improved A40 running on the east side of the new westbound entry slip road and leading south westwards off the improved B4022 and its integral Cycle Track, will provide a pedestrian connection between the B4022 and Footpath 353/31/10 (South Leigh) on the east side of the new westbound entry slip road.
- 3.7 A new integral Cycle Track will continue on the northern side of the B4022 from the crossing point westwards and around the eastern side of the B4022 two way spur road and local access merge lane, where a further crossing point will be provided onto the existing integral Cycle Track on its northern side, taking cyclists and pedestrians on their journey on that Cycle Track connection either eastwards towards the segregated Cycle Track of the A40 eastbound or westwards along the B4022 to the Cogges Hill Road/Jubilee Way junction and localities including Cogges, Newland, and Witney.
- 3.8 A further crossing point will be provided on the B4022, just west of where the new A40 eastbound exit slip road will junction with the B4022, providing a connection between the Cycle Track on the northern side of the B4022 and the new integral Footway that will be situated on the north west side of the new A40 eastbound exit slip road and taking users to Footpath connections on the north west side of the A40 Principal Road.
- 3.9 The B4022 two-way spur will be improved on its eastern side, to make for better movement of larger vehicles exiting from the service lane, which runs on the southern side of the B4022 opposite the residential property 'Shores Green' and which accommodates access vehicles from frontage residential properties and agricultural holdings lying along the road and which have use of the lane to travel along the B4022, as well as access to join the A40 eastbound to travel to Oxford.
- 3.10 Resurfacing of the B4022 and new road markings would be undertaken throughout across the new junction and up to its new slip roads and other local highway connection of the C16886 South Leigh Road.

Alternative Routes for Highways to be Stopped Up

- 3.11 It is recognised by the Council that for those highways which are to be stopped up, as described in paragraph 3.4 (a) (i) and (ii) above, that there needs to be another reasonably convenient route available or else provision of such a route before the highway is stopped up.

Alternative Route for the Footpaths which are to be stopped up on the North-West Side of the existing A40

- 3.12 The integral Footway of the improved A40 described in paragraph 3.3 (a) above, will provide the alternative route for the Footpaths and lengths of Footpaths which are to be stopped up on the north-west side of the existing A40, as described in paragraph 3.4 (a) (i) above. The length of the Footway is slightly shorter than the cumulative lengths of Footpaths to be stopped up and runs on a relatively similar south-west to north-east orientation between Footpath 410/41/20 (Witney) and the B4022, but set back at the top of the cutting slope of the proposed A40 eastbound exit slip road and to be contained within the new A40 boundary. The Council considers this integral Footway of the A40 will provide a reasonably convenient alternative route for pedestrian users of these stopped up Footpaths.

Alternative Route for the Footpath which is to be topped up on the South-East Side of the existing A40

- 3.13 The integral Footway of the improved A40 described in paragraph 3.3 (b) above, will provide the alternative route for this stopped up length of Footpath. The length of the Footway is of a similar length of the combined route of the length of Footpath (410/41/40 (Witney)) on the north-west side of the A40 from the B4022 which pedestrians would use to then cross the A40 to join this Footpath at its A40 connection, together with its stopped up length. The Council considers this integral Footway of the A40 will provide a reasonably convenient alternative route for pedestrian users of this stopped up Footpath.

Summary

- 3.14 The SRO is made in relation to the Classified Road, namely the A40 Principal Road which is to be improved under the Scheme.
- 3.15 I am satisfied that the SRO provisions of highways stopping up and highways improvements are necessary as a consequence of the Scheme works.
- 3.16 I note that for those highways, Footpaths, which are to be stopped up reasonably convenient routes will be provided within the improved A40 Classified Road works before the relevant highway is stopped up, allowing the Secretary of State for Transport to satisfy himself on that matter under Section 14(6) of the Highways Act 1980.

4 **RESPONSE TO OBJECTOR CONCERNS ABOUT DRAINAGE MITIGATION (OBJECTIONS 2,3,4)**

4.1 In relation to drainage mitigation, the Objections 2, 3 and 4 [CDs D.2, D.3 and D.4] have raised concerns regarding:

- No mitigation drainage has been agreed with the landowners.

Assessment Scope and Approach

4.2 An FRA in accordance with the National Planning Policy Framework (**NPPF**) and a drainage strategy which adheres to the Council, the LLFA), guidance have been prepared for the proposed Scheme. These form part of the Environmental Impact Assessment (EIA) undertaken for the Scheme submitted for planning and demonstrate that the Scheme is safe from flooding and will not increase the risk of flooding elsewhere, including on the land to the south of the proposed on-slip owned by the Objectors 2, 3 and 4.

4.3 As a result, the Scheme designer does not consider that any additional mitigation drainage is required.

4.4 Hydraulic modelling has been undertaken to validate the drainage proposals. The proposed drainage strategy adheres to the LLFA's surface water discharge hierarchy and utilises SuDS to attenuate and treat surface water runoff from the Scheme and provide betterment with regards to discharge rates and water quality from existing catchments within the Scheme extents. The preliminary drainage design undertaken for the Scheme is documented within sections 2.101 to 2.115 of this Proof of Evidence.

4.5 The drainage strategy will be reviewed and finalised, and a detailed drainage design (in particular the SuDS details), will be submitted to the County Planning Authority (**CPA**) for agreement and sign off by the LLFA prior to the Scheme's construction. This is required by the CPA (pursuant to planning conditions 20, 21 and 22 of the current Planning Permission for the Scheme) [CD F.1] to ensure that there is a suitable sustainable drainage system in place to manage run-off and support improvements in water quality.

5 RESPONSE TO OBJECTOR CONCERNS OF POTENTIAL IMPACTS ON SGN APPARATUS (OBJECTION 1) [CD D.1]

5.1 In relation to Southern Gas Network apparatus, Southern Gas Network Plc has raised concerns regarding:

- The protection of Southern Gas Network gas apparatus.

Assessment Scope and Approach

5.2 On behalf of the Council, AECOM have actively engaged with Southern Gas Network Plc and since their original interaction have been able identify the potential impact on the Southern Gas Network Plc apparatus.

5.3 This has been achieved by conducting trial hole excavations and GPR surveys to determine the location and depths of the apparatus in order to confirm if the minimum requirement of cover between the Southern Gas Network apparatus and the proposed Scheme carriageway is maintained. Following the excavated trial holes, it has been confirmed with Southern Gas Network Plc that their apparatus is of sufficient depth and that the Scheme provides sufficient cover.

5.4 Further discussions will take place during the Detailed Design phase to ratify the proposed levels of the Scheme and the interface with the Southern Gas Network apparatus through the NRSWA process to ensure the level of asset protection will be to Southern Gas Network requirements.

5.5 An Asset Protection Agreement (APA) is in place with Southern Gas Network to assure the asset owner that the method statement for delivery meets the requirements for protection of their asset. The terms of the APA were agreed between the Council and SGN on 12 February 2024 with SGN committing to removing their objection upon signature.

6 CONCLUSION

- 6.1 As set out within the Strategic Case and Need evidence, provided by Nicholas Blades of the Council [CD G.2] the initial analysis carried out has determined the need for the Scheme.
- 6.2 Significant traffic congestion currently exists on Bridge Street, Witney, due to it being a singular crossing point between east and west Witney. The options have been developed based on the challenges faced by Witney and the Scheme objectives. They aim to help improve traffic flow conditions at Bridge Street & Witney town centre, encourage modal shift to sustainable forms of transport by improving public transport, cycling & walking infrastructure, minimise the impact of general traffic resulting from proposed housing developments, improve air quality, and improve local and strategic accessibility for existing and proposed new residential areas, in particular the planned and proposed developments in east Witney.
- 6.3 Traffic congestion is a serious and recognised concern in Witney, and an Air Quality Management Area (**AQMA**) is designated at Bridge Street. This congestion is largely due to there being only one main vehicular crossing point across the River Windrush at Bridge Street, which acts as a bottleneck to traffic travelling east-west across the town. This will deteriorate in the future (with the projected growth) if a Scheme is not delivered to address the issue.
- 6.4 The need for the Scheme is evident in order to meet the Council's objectives and reduce congestion in and around Witney. The planned increase in the number of dwellings would cause an additional substantial increase in traffic in Witney town centre and its surrounding areas.
- 6.5 The Council has issued a Stopping Up Order (**SRO**) under Section 14 of the Highways Act 1980 for the Classified Road works associated with the A40 Principal Road improvement. If approved by the Secretary of State for Transport, the SRO will enable the implementation of the Scheme by permitting the closure of footpaths that cross or enter into the A40 Principal Road improvement area. Additionally, it grants authorisation for essential and related highway modifications adjacent to the A40 Principal Road improvement.
- 6.6 The development of the preferred Scheme design, Option 2A-G, largely adheres to the comprehensive design standards outlined in the DMRB. This commitment to design excellence is further reinforced through robust survey information, an understanding of local constraints such as utilities, visual impact analysis, rigorous road safety audits, local junction modelling assessments, lighting modelling, thorough pavement assessments, hydraulic modelling for drainage, vehicular restraint assessments, and a comprehensive flood risk assessment. By following these established processes, the design ensures an appropriate, best-practice, safe, and efficient solution.
- 6.7 A thorough, detailed and inclusive assessment of potential options based around Department for Transport (DfT), Transport Analysis Guidance has been undertaken to ensure that the preferred Scheme addresses the challenges the area faces, meets a series of appropriate Scheme objectives, meets local and wider policy ambitions and takes no more land than is necessary.
- 6.8 Furthermore, the design approach is holistic, aiming not only to meet technical standards but also to address broader considerations. It actively mitigates environmental impacts (visual, flood risk, ecology) identified in the Environmental Impact Assessment through inclusion of landscape design, drainage design including SUDS, the Scheme minimises land take, mitigates potential buildability issues, and, crucially, incorporates a design that has undergone public scrutiny. This public engagement, involving consultation and feedback, has resulted in the Scheme gaining acceptance among the public. The end result is a design that not only aligns with regulatory standards but also stands as the most efficient solution for Witney and the surrounding areas, meeting the objectives set forth by the Council.
- 6.9 Option 2A-G, the preferred Scheme design, proposes west facing slip roads at the B4022/ A40 junction, including an improved cycle link along the B4022 to the C16886 South Leigh Road. The new slip roads will form automatic traffic signal-controlled T-junctions with the existing B4022 on either side of the A40 bridge. The Scheme will also incorporate a cycleway/footway between the existing off carriageway route on Oxford Hill and the South Leigh Road junction. This option is expected to provide an alternative to local traffic wishing to access west Witney. This option has been modelled in the Council's OSM model and has demonstrated benefits in

reducing traffic at Bridge Street. Public transport provision can be improved with newly defined routes to make use of the slip roads.

- 6.10 After conducting the designs, further assessments and traffic modelling, the chosen option for the Scheme stands out as an effective design solution that will meet the Scheme's objectives.

7 STATEMENT OF TRUTH AND DECLARATION

- 7.1 I confirm that insofar as the facts stated in my proof evidence are within my own knowledge, I have made clear what they are, and I believe them to be true and that the opinion I have expressed represents my true and complete professional opinion.
- 7.2 I confirm that my proof of evidence includes all facts that I regard as being relevant to the opinions that I have expressed and that I have drawn attention to any matter which would affect the validity of those opinions.
- 7.3 I confirm that my duty to the Inquiry as an expert witness overrides any duty to those instructing or paying me, and I have understood this duty and complied with it in giving my evidence impartially and objectively, and I will continue to comply with that duty as required.
- 7.4 I confirm that, in preparing this proof of evidence, I have assumed that same duty that would apply to me when giving my expert opinion in a court of law under oath or affirmation. I confirm that this duty overrides any duty to those instructing or paying me, and I have understood this duty and complied with it in giving my evidence impartially and objectively, and I will continue to comply with that duty as required.
- 7.5 I confirm that I have no conflicts of interest of any kind other than those already disclosed in this proof of evidence.



PHILIPPE MOHAN NIRMALENDRAN

20 FEBRUARY 2024