

A303 Sparkford to Ilchester Dualling Scheme TR010036

6.1 Environmental Statement Chapter 3 Assessment of Alternatives

APFP Regulation 5(2)(a)
Planning Act 2008

Infrastructure Planning (Applications: Prescribed
Forms and Procedure) Regulations 2009
July 2018



Infrastructure Planning

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(Applications: Prescribed Forms
and Procedure) Regulations
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**A303 Sparkford to Ilchester Dualling
Scheme**

Development Consent Order 201[X]

**6.1 Environmental Statement
Chapter 3 Assessment of Alternatives**

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3 Assessment of Alternatives

3.1 Introduction

3.1.1 Regulation 14(2) of the *Infrastructure Planning (Environmental Impact Assessment) Regulations 2017* (the *EIA Regulations*) requires, “a description of the reasonable alternatives (for example in terms of development design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of environmental effects”.

3.2 Scheme history

3.2.1 Dualling of the A303 between Sparkford and Ilchester was first investigated in the early 1990s. The preferred option reached public inquiry in 1996 and orders were prepared, but the scheme was not progressed any further. A review of the previous work was carried out in 2003 and the scheme recommended by the planning inspector in 1996 was taken to public consultation (in 2003). However, just prior to orders being published in 2004, the scheme was not progressed any further due to funding.

3.2.2 The preferred scheme in 2003 was a combination of online and offline dualling between Hazlegrove Roundabout in the east and the westbound deceleration lane to Podimore in the west.

3.3 Road Investment Strategy

3.3.1 Dualling of the A303 between Sparkford and Ilchester was announced in the *Road Investment Strategy* (RIS) for the 2015 / 16 to 2019 / 20 road period¹, as part of a total A303 / A30 / A358 corridor package of commitments worth £2 billion.

3.3.2 The RIS sets out the list of schemes that are to be developed by Highways England over the 2015 / 16 to 2019 / 20 road period.

3.3.3 Following this announcement, a new set of options for dualling of the A303 between Sparkford and Ilchester were subsequently appraised, building on the previous work in 1996 and 2003. Options were developed and assessed in a systematic way, until a preferred option was identified. The process is discussed in sections 3.4 and 3.5 of this chapter.

¹ DfT (2015) *Road Investment Strategy: 2015 to 2020* [online] available at: <https://www.gov.uk/government/collections/road-investment-strategy> (last accessed June 2018).

3.4 Assessment methodology overview

Sifting of options

- 3.4.1 At the initial Options Identification stage in the scheme, a total of 13 potential route options were originally identified to ensure a wide range of possibilities were considered. Further detail of these options is presented in section 3.5 below.
- 3.4.2 These options were subject to an environmental risk assessment which identified the initial environmental (including environmental policy) constraints, risks and opportunities to inform the development / refinement of the identification of options. This process was informed using desk-based information. The results of the preliminary level of assessment was used to inform the EAST sifting, which is discussed in more detail in paragraphs 3.5.1 to 3.5.6 below.
- 3.4.3 The results of the environmental risk assessment were used to inform the criteria used within the Early Assessment Sifting Tool (EAST), which forms part of Step 6 of WebTAG – Initial Sifting².
- 3.4.4 During this options selection stage, 13 options were initially sifted for their best fit against specific strategic, economic, managerial, financial and commercial criteria in accordance with the Transport Analysis Guidance – *The Transport Appraisal Process* of WebTAG. The initial option sifting process applied the EAST.
- 3.4.5 As the outputs of the EAST provide only a qualitative score³, a quantitative scoring system was created for the purposes of ranking all the options based on the results of the initial sift, as EAST does not provide this. This scoring system was created to enable options to be discarded based on poor performance against the strategic, economic, managerial, financial and commercial criteria. Therefore, once the fields in EAST were completed, it was necessary to convert the answers provided into an overall numeric score. This was achieved by adding together all of the individual scores for each option when measured against all the EAST criteria. This allowed options to be directly compared against each other. The results of this process are summarised within paragraphs 3.5.7 and 3.5.8.

² Department for Transport (2011) Early Assessment Sifting Tool (EAST) [online] available at: <https://www.gov.uk/government/publications/transport-business-case> (last accessed July 2018).

³ Department for Transport (2011) Early Assessment Sifting Tool (EAST) Guidance document [online] available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/4475/east-guidance.pdf (last accessed July 2018).

3.4.6 It was decided that the sift would be split into 2 phases. In phase 1, all 13 options were scored against the strategic case within EAST. Any option which scored poorly (below a set threshold) was removed from the process. At the end of phase 1, 2 options were removed. The remaining 11 options were taken forward to phase 2 and measured against the remaining economic, financial, managerial and commercial cases. On completion of Phase 2 of the EAST sifting process, it was felt that a number of the options were very similar and did not provide sufficient variety to obtain a broad range of opinion from stakeholders and the public. Four options were subsequently shortlisted for further assessment, as discussed further in section 3.5.8.

Scoping level assessment

3.4.7 On completion of the EAST sifting, a scoping level of environmental assessment was undertaken for the 4 short-listed options. This process was completed in accordance with the Design Manual for Roads and Bridges (DMRB) Volume 11⁴ to a Scoping Level for all environmental topics contained within Highways England's Interim Advice Note (IAN) 125/15⁵. This process aimed to identify and report the baseline conditions of the existing environmental assets and to determine which (if any) environmental topics were to be further examined in the course of the Environmental Impact Assessment (EIA). It was informed using desk-based information. The results of the scoping level of assessment are discussed in Table 3.1 below.

Design Manual for Roads and Bridges Simple level assessment

3.4.8 Two route options were taken to public consultation during 2017, as discussed in section 3.5.12 to 3.5.14 below. For these options, the scoping level of environmental assessment was expanded to a DMRB Simple level of assessment as defined in IAN 125/15. As well as desk-based information, site surveys were undertaken to further support the assessment, including Phase 1 and Phase 2 ecology surveys, cultural heritage walkover, and a landscape survey to identify character areas and key views. The results of the simple level of assessment are discussed in Table 3.2 below.

Design Manual for Roads and Bridges Detailed level assessment

3.4.9 The preferred option was announced in October 2017 and was taken to public consultation between January and March 2018. The preferred option has

⁴ Highways England (2008) Design Manual for Roads and Bridges Volume 11 Section 2 Part 4 HA 204/08 Scoping of Environmental Impact Assessments [online] available at:

<http://www.standardsforhighways.co.uk/ha/standards/dmrb/vol11/section2/ha20408.pdf> (last accessed July 2018).

⁵ Highways England (2015) Interim Advice Note 125/15 Environmental Assessment Update [online] available at: <http://www.standardsforhighways.co.uk/ha/standards/ians/pdfs/ian125r2.pdf> (last accessed July 2018).

subsequently been subject to a DMRB Detailed level of environmental assessment for all those topics scoped in to the assessment, with the full assessment being reported within this Environmental Statement (ES). A wide range of surveys were undertaken to support the ES, as well as consultation with environmental bodies to further inform the assessments. Full details of these surveys are presented within Chapters 5 to 14 of Volume 6.1.

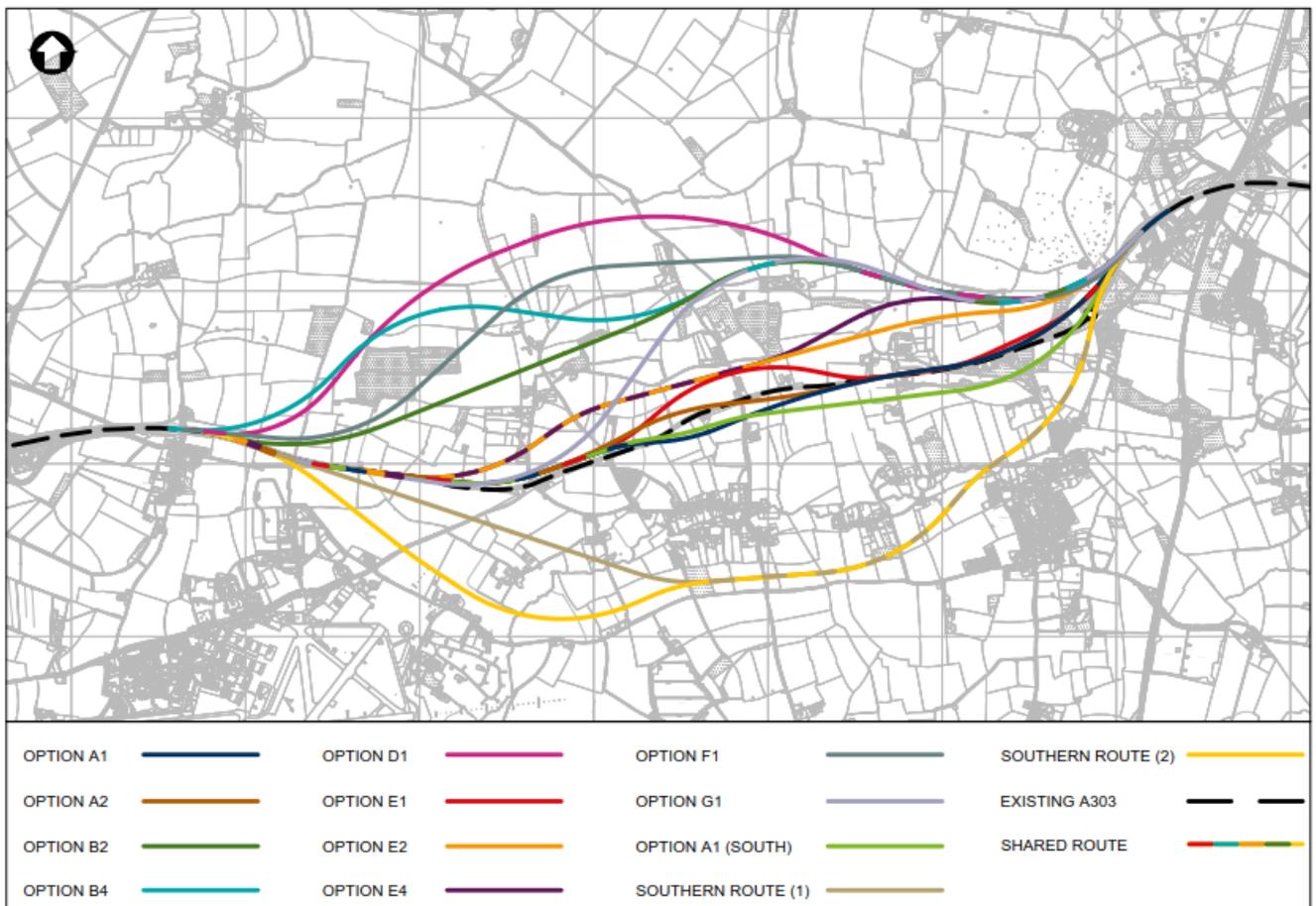
3.5 Reasonable alternatives studied during options selection

Sifting of options

3.5.1 Thirteen potential route options were originally identified to ensure a wide range of possibilities were considered. These are shown on Figure 3.1 below and can be broadly classified as central, northern, and southern routes:

- Central: Option A1, Option A1 (South), and Option A2
- Northern: Option B2, Option B4, Option D1, Option E1, Option E2, Option E4, Option F1, and Option G1
- Southern: Southern Route (i), Southern Route (ii)

Figure 3.1: The 13 route options originally identified



Source: Mott MacDonald Sweco Joint Venture

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- 3.5.2 As part of Phase 1 of the Options Sifting process (see section 3.4 above), the Southern Route 1 and Southern Route 2 were discounted. These options would have passed through the River Cam floodplain and would have introduced new severance between the villages of Queen and West Camel. This was considered to be less favourable to those options that avoided the flood plains and were to the north of the villages.
- 3.5.3 As part of Phase 2 of the Options Sifting process (see section 3.4 above), the EAST sifting tool looked at how each option would affect economic growth, carbon emissions, social-distributional impacts, the local environment, well-being and value for money. All options scored similarly as all options were considered to improve connectivity, reliability, resilience, and the delivery of housing. All options were scored the same regarding carbon emissions, as all would require significant construction work, would not increase vehicle-km as the options proposed were similar in length to the existing A303 and would all increase efficiency by providing dual carriageway alignments with grade separated junctions reducing the interaction between local and strategic traffic. Options scored differently for air quality and noise due to the different proximities to sensitive receptors, such as residential and ecological receptors. Due to the present of heritage constraints such as scheduled monuments within the vicinity, options scored differently based on their proximity to these assets, as well as scoring differently for landscape based on the location of the option within the landscape, and the topography which would affect the visual effects.
- 3.5.4 In terms of ease of construction, all of the options were considered to be relatively easy to construct and deliverable within the timescale established within the RIS. Historic options which had been identified in previous studies were considered to have a higher level of support evidence than options that were first generated during this scheme and have scored higher as a result.
- 3.5.5 The financial section of the sift looked at the potential cost of the scheme and the cost risk for each. Based on the Order of Magnitude Estimate, all options scored the same as they were anticipated to have scheme costs between the £100 to £250 million range used in the EAST spreadsheet.
- 3.5.6 The commercial element of EAST looked at how easy it would be to remove or add features of the design depending on the level of funding available, and the sources of funding and any income generation. The options following the existing corridor of the A303 were found to be less flexible due to adjacent properties and environmental constraints. However, all options scored the same regarding funding sources with no intention to toll any of the options.

Scoping level assessment

3.5.7 On completion of EAST, it was felt that 4 out of the 11 remaining options were either the lowest scoring or were very similar to others and were therefore rejected in this phase. As a result, out of the remaining 7 options, 4 options were shortlisted for further assessment, based on the following rationale:

- Option B4 and D1 were very similar except in the route that they take past Steart Hill Farm and Vale Farm. As such B4 was taken forward as it scored better than D1 within following the EAST process.
- Option A1 and A2 were very similar in their alignment except in the route that they take past the Camel Hill Methodist Church and scored equally. Option A2 was therefore taken forward as the next (third) highest scoring option, on the basis that it was the preferred route from the previous consultation.
- Options E2 and E4 scored identically. However, Option E4 provided elements which were not covered by other options and was therefore taken forward as the fourth highest scoring option.
- Option F1 was taken forward as it was 1 of the 4 highest scoring options.

3.5.8 Therefore, the 4 shortlisted options were:

- **Option A2:** A part offline part online option that followed the existing route closely.
- **Option B4:** An offline route north of the existing A303 that followed relatively low lying land around the northern perimeter of Camel Hill.
- **Option E4:** This option followed a corridor similar to that of the existing A303 whilst keeping new works sufficiently separate from the existing carriageway to enable the retention of the existing A303 for local use.
- **Option F1:** An offline route to the north of the existing A303. Of the 4 shortlisted options this was the route that reached furthest north. At its eastern end, Option F1 took a near similar course to Option B4. However, to the west, this option followed an alternative corridor north of Steart Hill.

3.5.9 Table 3.1 provides a review of the environmental effects associated with all 4 options subject to a scoping level of assessment.

Table 3.1: Scoping level assessment results for the 4 short listed options

Scoping topic (including environmental factor*)	Option A2	Option B4	Option E4	Option F1
Air Quality (including Human Health)	Predicted to result in an overall improvement of local ambient air quality with respect to nitrogen dioxide (NO ₂) and Particulate Matter 10µm (PM ₁₀). No predicted locations where the scheme would cause an exceedance of Air Quality Objectives. Potential increase in regional emissions of mono-nitrogen oxides (NO _x) and PM ₁₀ , resulting in an overall air quality dis-benefit. Overall, air quality impacts during construction are not likely to be significant following the implementation of mitigation measures.	Predicted to result in an overall improvement of local ambient air quality with respect to nitrogen dioxide (NO ₂) and Particulate Matter 10µm (PM ₁₀). No predicted locations where the scheme would cause an exceedance of Air Quality Objectives. Potential increase in regional emissions of mono-nitrogen oxides (NO _x) and PM ₁₀ , resulting in an overall air quality dis-benefit. Overall, air quality impacts during construction are not likely to be significant following the implementation of mitigation measures.	Predicted to result in an overall improvement of local ambient air quality with respect to nitrogen dioxide (NO ₂) and Particulate Matter 10µm (PM ₁₀). No predicted locations where the scheme would cause an exceedance of Air Quality Objectives. Potential increase in regional emissions of mono-nitrogen oxides (NO _x) and PM ₁₀ , resulting in an overall air quality dis-benefit. Overall, air quality impacts during construction are not likely to be significant following the implementation of mitigation measures.	Predicted to result in an overall improvement of local ambient air quality with respect to nitrogen dioxide (NO ₂) and Particulate Matter 10µm (PM ₁₀). No predicted locations where the scheme would cause an exceedance of Air Quality Objectives. Potential increase in regional emissions of mono-nitrogen oxides (NO _x) and PM ₁₀ , resulting in an overall air quality dis-benefit. Overall, air quality impacts during construction are not likely to be significant following the implementation of mitigation measures.
Cultural Heritage	Potential significant adverse effects to unknown buried archaeological remains as the option would cut through an area considered to have a high archaeological potential, situated immediately south of the western extent of the proposed option. Potential significant adverse effects due to potential physical impacts on Hazlegrove House Grade II Listed Registered Park and Garden as well as potential impacts on the setting of designated and non-designated	Potential for direct adverse effects to unknown buried archaeological remains. Potential significant adverse effects due to potential physical impacts on Hazlegrove House Grade II Listed Registered Park and Garden as well as potential impacts on the setting of designated and non-designated heritage assets including Medieval settlement.	Potential for direct adverse effects to unknown buried archaeological remains. Potential significant adverse effects due to potential physical impacts on Hazlegrove House Grade II Listed Registered Park and Garden as well as potential impacts on the setting of designated and non-designated heritage assets.	Potential for direct adverse effects to unknown buried archaeological remains. Potential significant adverse effects due to potential physical impacts on Hazlegrove House Grade II Listed Registered Park and Garden as well as potential impacts on the setting of designated and non-designated heritage assets including Medieval settlement.

Scoping topic (including environmental factor*)	Option A2	Option B4	Option E4	Option F1
	heritage assets including Roman British settlement.			
Landscape and Visual Impact	Given that the proposed route would have sections of being either online or very close to the existing A303 route corridor, the impacts upon landscape character and nearby visual receptors would be minimised by keeping the impacts of major road corridors limited to an isolated area already characterised by a major road. However, potentially significant adverse effects anticipated due to removal of vegetation and the presence of construction plant and lighting. Potential for effects to Hazlegrove House Registered Park and Garden as the route would traverse the southern extents of the garden, with views likely from elevated positions towards the scheme in the south. Potentially significant adverse effects during operation due to the removal of vegetation and the opening up of views to sensitive receptors.	Potentially significant adverse effects during construction given the undeveloped nature of the area to the north of the existing A303, the placement of this option in an otherwise rural and tranquil environment would lead to a more notable change. Potential for effects to Hazlegrove House Registered Park and Garden as the route would traverse the southern extents of the garden, with views likely from elevated positions towards the scheme in the south. Potentially significant adverse effects when operational as the new road could be visible from the surrounding receptors, as well as receptors from the elevated topography in the surrounding area.	Potentially significant adverse effects during construction given the undeveloped nature of the area to the north of the existing A303, the placement of this option in an otherwise rural and tranquil environment would lead to a more notable change. Potential for effects to Hazlegrove House Registered Park and Garden as the route would traverse the southern extents of the garden, with views likely from elevated positions towards the scheme in the south. Potentially significant adverse effects when operational as the new road could be visible from the surrounding receptors, as well as receptors from the elevated topography in the surrounding area.	Potentially significant adverse effects during construction given the undeveloped nature of the area to the north of the existing A303, the placement of this option in an otherwise rural and tranquil environment would lead to a more notable change. Potential for effects to Hazlegrove House Registered Park and Garden as the route would traverse the southern extents of the garden, with views likely from elevated positions towards the scheme in the south. Potentially significant adverse effects when operational as the new road could be visible from the surrounding receptors, as well as receptors from the elevated topography in the surrounding area.
Geology and soils (including Human Health)	Potentially significant adverse direct effects due to direct encroachment on 'Land Adjacent to Hazlegrove Park' historic landfill, and the close proximity of 'Camel Hill Quarry' historic landfill.	Potentially significant adverse direct effects due to direct encroachment on 'Land Adjacent to Hazlegrove Park' historic landfill, and the close proximity of 'Camel Hill Quarry' historic landfill.	Potentially significant adverse direct effects due to direct encroachment on 'Land Adjacent to Hazlegrove Park' historic landfill, and the close proximity of 'Camel Hill Quarry' historic landfill.	Potentially significant adverse direct effects due to direct encroachment on 'Land Adjacent to Hazlegrove Park' historic landfill, and the close proximity of 'Camel Hill Quarry' historic landfill.

Scoping topic (including environmental factor*)	Option A2	Option B4	Option E4	Option F1
	The completed and operational Scheme is not expected to result in any significant direct adverse impacts upon Geology and Soils.	The completed and operational scheme is not expected to result in any significant direct adverse impacts upon Geology and Soils.	The completed and operational Scheme is not expected to result in any significant direct adverse impacts upon Geology and Soils.	The completed and operational scheme is not expected to result in any significant direct adverse impacts upon Geology and Soils.
Biodiversity	During construction, potentially significant direct and indirect impacts are anticipated to protected species from the introduction of sources of noise and light disturbance, designated sites, through the potential to disturb and remove habitats within the Hazlegrove Park Local Wildlife Site (LWS) and Camel Hill Transmitter Site LWS and sensitive habitats, mainly through fragmentation of terrestrial habitat and changes to drainage facilities. Once operational the proposed works for all of the proposed options would result in the permanent loss and potential severance of habitats of biodiversity value. It is anticipated that there is the potential for significant adverse effects upon nature conservation features once operational requiring the development of mitigation measures.	During construction, potentially significant direct and indirect impacts are anticipated to protected species from the introduction of sources of noise and light disturbance, designated sites, through the potential to disturb and remove habitats within the Hazlegrove Park LWS and sensitive habitats, mainly through fragmentation of terrestrial habitat and changes to drainage facilities. Once operational the proposed works for all of the proposed options would result in the permanent loss and potential severance of habitats of biodiversity value. It is anticipated that there is the potential for significant adverse effects upon nature conservation features once operational requiring the development of mitigation measures.	During construction, potentially significant direct and indirect impacts are anticipated to protected species from the introduction of sources of noise and light disturbance, designated sites, through the potential to disturb and remove habitats within the Hazlegrove Park LWS and sensitive habitats, mainly through fragmentation of terrestrial habitat and changes to drainage facilities. Once operational the proposed works for all of the proposed options would result in the permanent loss and potential severance of habitats of biodiversity value. It is anticipated that there is the potential for significant adverse effects upon nature conservation features once operational requiring the development of mitigation measures.	During construction, potentially significant direct and indirect impacts are anticipated to protected species from the introduction of sources of noise and light disturbance, designated sites, through the potential to disturb and remove habitats within the Hazlegrove Park LWS and Annis Hill LWS and sensitive habitats, mainly through fragmentation of terrestrial habitat and changes to drainage facilities. Once operational the proposed works for all of the proposed options would result in the permanent loss and potential severance of habitats of biodiversity value. It is anticipated that there is the potential for significant adverse effects upon nature conservation features once operational requiring the development of mitigation measures.
Noise and vibration (including Human Health)	During construction, there is the potential to directly alter the noise and vibration baseline for	During construction, there is the potential to directly alter the noise and vibration baseline for	During construction, there is the potential to directly alter the noise and vibration	During construction, there is the potential to directly alter the noise and vibration

Scoping topic (including environmental factor*)	Option A2	Option B4	Option E4	Option F1
	<p>sensitive receptors for a temporary period, mainly in the vicinity of the Scheme option envelope, However, no significant effects are anticipated with appropriate mitigation measures in place.</p> <p>The route would broadly follow the existing road corridor, therefore during operation there is the potential for changes to traffic flows and road alignment to result in noise changes at noise sensitive receptors, particularly from increased traffic. Although mitigation will be in place it is considered that there is the potential for significant residual adverse effects to noise sensitive receptors.</p>	<p>sensitive receptors for a temporary period, mainly in the vicinity of the scheme option envelope, However, no significant effects are anticipated with appropriate mitigation measures in place.</p> <p>There is potential for changes to traffic flows and the road alignment to result in adverse impacts at noise sensitive receptors by introducing noise sources into a tranquil environment. Although this option has the potential to reduce road traffic noise levels at existing Noise Important Areas (NIAs) there is the potential for significant residual adverse effects to noise sensitive receptors during operation.</p>	<p>baseline for sensitive receptors for a temporary period, mainly in the vicinity of the Scheme option envelope, However, no significant effects are anticipated with appropriate mitigation measures in place.</p> <p>There is potential for changes to traffic flows and the road alignment to result in adverse impacts at noise sensitive receptors by introducing noise sources into a tranquil environment. Although this option has the potential to reduce road traffic noise levels at existing NIAs there is the potential for significant residual adverse effects to noise sensitive receptors during operation.</p>	<p>baseline for sensitive receptors for a temporary period, mainly in the vicinity of the Scheme option envelope, However, no significant effects are anticipated with appropriate mitigation measures in place.</p> <p>There is potential for changes to traffic flows and the road alignment to result in adverse impacts at noise sensitive receptors by introducing noise sources into a tranquil environment. Although this option has the potential to reduce road traffic noise levels at existing NIAs there is the potential for significant residual adverse effects to noise sensitive receptors during operation.</p>
Material assets,	<p>Due to the size and scale of the project there is potential for significant adverse direct effects due to the quantity of materials that would be required for construction and adverse direct effects for wastes from the contribution to landfill and the subsequent indirect risk of damage to local hydrological systems and emissions associated with necessary transport.</p>	<p>Due to the size and scale of the project there is potential for significant adverse direct effects due to the quantity of materials that would be required for construction and adverse direct effects for wastes from the contribution to landfill and the subsequent indirect risk of damage to local hydrological systems and emissions associated with necessary transport.</p>	<p>Due to the size and scale of the project there is potential for significant adverse direct effects due to the quantity of materials that would be required for construction and adverse direct effects for wastes from the contribution to landfill and the subsequent indirect risk of damage to local hydrological systems and emissions associated with necessary transport.</p>	<p>Due to the size and scale of the project there is potential for significant adverse direct effects due to the quantity of materials that would be required for construction and adverse direct effects for wastes from the contribution to landfill and the subsequent indirect risk of damage to local hydrological systems and emissions associated with necessary transport.</p>

Scoping topic (including environmental factor*)	Option A2	Option B4	Option E4	Option F1
	No significant direct impacts on materials are anticipated to result from the operation as there would be minimal requirements for materials, besides infrequent maintenance activities.	No significant direct impacts on materials are anticipated to result from the operation as there would be minimal requirements for materials, besides infrequent maintenance activities.	No significant direct impacts on materials are anticipated to result from the operation as there would be minimal requirements for materials, besides infrequent maintenance activities.	No significant direct impacts on materials are anticipated to result from the operation as there would be minimal requirements for materials, besides infrequent maintenance activities.
People and Communities (including Population and Human Health)	A derelict barn to the north of the existing A303 and a residential property at West Camel would have to be demolished to accommodate construction of the proposed route, with the potential for significant adverse effects. Direct effects upon amenity due to construction activities for NMUs and MTs as well as operational adverse effects due to the removal of most of the through-flow traffic from the existing A303. Temporary and permanent agricultural land acquisition would be required, therefore there is the potential for significant effects. Direct effects are anticipated upon non-motorised users, motorised traveller views, driver stress and severance, however these are not considered to be significant.	Direct effects upon amenity due to construction activities for NMUs and MTs as well as operational adverse effects due to the removal of most of the through-flow traffic from the existing A303. Temporary and permanent agricultural land acquisition would be required, therefore there is the potential for significant effects. Direct effects are anticipated upon non-motorised users, motorised traveller views and driver stress, however these are not considered to be significant.	A residential property, a derelict building (The Spinney) and a derelict barn to the north of the existing A303 would have to be demolished to accommodate construction of the proposed route, with the potential for significant adverse effects. Direct effects upon amenity due to construction activities for NMUs and MTs as well as operational adverse effects due to the removal of most of the through-flow traffic from the existing A303. Temporary and permanent agricultural land acquisition would be required, therefore there is the potential for significant effects. Direct effects are anticipated upon non-motorised users, motorised traveller views and driver stress, however these are not considered to be significant.	Direct effects upon amenity due to construction activities for NMUs and MTs as well as operational adverse effects due to the removal of most of the through-flow traffic from the existing A303. Temporary and permanent agricultural land acquisition would be required, therefore there is the potential for significant effects. Direct effects are anticipated upon non-motorised users, motorised traveller views and driver stress, however these are not considered to be significant.

Scoping topic (including environmental factor*)	Option A2	Option B4	Option E4	Option F1
Road Drainage and the Water Environment	There is the potential for mobilisation of sediment and contaminants from road runoff to the watercourses as a consequence of road construction. Construction activities could also increase the risk of a pollution incident at the site of works, associated with contaminated land or spills/leaks of chemicals which could adversely impact on nearby LWSs. However, due to the temporary nature of these impacts, and with appropriate mitigation measures and best practice working measures implemented, the risk is considered to be minimal.	There is the potential for mobilisation of sediment and contaminants from road runoff to the watercourses as a consequence of road construction. Construction activities could also increase the risk of a pollution incident at the site of works, associated with contaminated land or spills/leaks of chemicals which could adversely impact on nearby LWSs. However, due to the temporary nature of these impacts, and with appropriate mitigation measures and best practice working measures implemented, the risk is considered to be minimal.	There is the potential for mobilisation of sediment and contaminants from road runoff to the watercourses as a consequence of road construction. Construction activities could also increase the risk of a pollution incident at the site of works, associated with contaminated land or spills/leaks of chemicals which could adversely impact on nearby LWSs. However, due to the temporary nature of these impacts, and with appropriate mitigation measures and best practice working measures implemented, the risk is considered to be minimal.	There is the potential for mobilisation of sediment and contaminants from road runoff to the watercourses as a consequence of road construction. Construction activities could also increase the risk of a pollution incident at the site of works, associated with contaminated land or spills/leaks of chemicals which could adversely impact on nearby LWSs. However, due to the temporary nature of these impacts, and with appropriate mitigation measures and best practice working measures implemented, the risk is considered to be minimal.

*The assessment was undertaken prior to the implementation of the new Infrastructure Planning (EIA) Regulations.

- 3.5.10 The environmental effects of scheme options helped to inform the decision on which of the central and northern options were taken forward. Regarding the central options (Option A2 and Option E4), Option A2 presented fewer adverse effects to landscape and the historic environment in comparison to Option E4, since Option A2 would be more online in parts and would therefore affect smaller areas of existing landscape and historic environment. Regarding the northern options, both option F1 and B4 would have had similar environmental effects. However, option F1 had a higher benefit-cost-ratio overall, when reliability benefits were added.
- 3.5.11 As a result of the assessment and appraisal work, it was concluded that 1 central and 1 northern route option should be taken forward to the non-statutory public consultation which was held in February and March 2017. These 2 options were Option 1 (renamed from Option A2) and Option 2 (renamed from Option F1).
- 3.5.12 Option 1 and Option 2 were subsequently subject to further environmental (see Table 3.2 below), economic, and technical assessment. The results of these assessments, along with the outcomes of the consultation, helped to inform the identification of the preferred route, which was announced by Highways England as Option 1 in October 2017. The principal reasons for the decision to proceed with Option 1 over Option 2, are as follows:
- Minimises land-take.
 - Shortest of the 2 options, reducing journey time and carbon emissions.
 - The route follows the existing A303 corridor very closely, minimising construction in an unspoilt rural setting, which would be at odds with the landscape character in this area and result in more adverse visual effects.
 - Reduced impact on Hazlegrove House Registered Park and Garden (RPG).
 - Slightly less impact on biodiversity.
 - 64% of responders favoured Option 1, and 29% favoured Option 2.

DMRB Simple level assessment

- 3.5.13 Table 3.2 provides a review of the environmental effects associated with Option 1 and Option 2.

Table 3.2: Environmental effects associated with Option 1 and Option 2

Scoping topic (including environmental factor*)	Option 1	Option 2
Air Quality (including Human Health)	<p>Low risk that Option 1 would lead to significant air quality effects at human receptors in accordance with IAN 174/13 and the change in NO₂ associated with the scheme is not expected to result in non-compliance with the EU Directive. The overall effects to human health and wellbeing are anticipated to be Not Significant Adverse, during both construction and operation. There is a potential risk of a Significant Adverse effect at the Stockton Wood and Down Site of Special Scientific Interest (SSSI) during operation.</p> <p>Option 1 is predicted to cause small changes in regional emissions during operation, although these are considered to be small compared to national emissions. Effects have been assigned as being Not Significant Adverse during both construction and operation.</p>	<p>Low risk that Option 2 would lead to significant air quality effects at human receptors in accordance with IAN 174/13 and the change in NO₂ associated with the scheme is not expected to result in non-compliance with the EU Directive. The overall effects to human health and wellbeing are anticipated to be Not Significant Adverse, during both construction and operation. There is a potential risk of a Significant Adverse effect at the Stockton Wood and Down SSSI during operation.</p> <p>Option 2 is predicted to cause small changes in regional emissions during operation, although these are considered to be small compared to national emissions. Effects have been assigned as being Not Significant Adverse during both construction and operation.</p>
Cultural Heritage	<p>Previous archaeological survey and investigation, as well as the archaeological aerial survey and appraisal undertaken, has demonstrated that there is a high potential for multi-period archaeological remains spanning the prehistoric period to WWII within the Option 1 study area. In addition to sub-surface archaeological features; there is the setting of multiple Listed buildings and the physical effects on a Grade II Registered Park and Garden, and an early 19th century milestone to consider. The potential for encountering or affecting the different heritage assets varies significantly between different locations within the study area.</p> <p>During construction, the overall significance of effects on designated heritage assets would be Moderate/Large Adverse. During operation, this would be Slight Adverse for designated heritage assets. The overall significance of effects on buried archaeology during construction would be Moderate Adverse, reducing to Neutral during operation.</p>	<p>Previous archaeological survey and investigation, as well as the archaeological aerial survey and appraisal undertaken, has demonstrated that there is a high potential for multi-period archaeological remains spanning the prehistoric period to WWII within the Option 2 study area. In addition to sub-surface archaeological features; there is the setting of multiple Listed buildings and the physical effects on a Grade II Registered Park and Garden, and an early 19th century milestone to consider. The potential for encountering or affecting the different heritage assets varies significantly between different locations within the study area.</p> <p>During construction, the overall significance of effects on designated heritage assets would be Moderate/Large Adverse. During operation, this would be Slight Adverse for designated heritage assets. The overall significance of effects on buried archaeology during construction would be Moderate Adverse, reducing to Neutral during operation.</p>
Landscape and Visual Impact	<p>It is considered that Option 1 would result in an overall Significant Adverse effect during construction, for both the landscape character and the effects to visual receptors.</p>	<p>It is considered that Option 2 would result in an overall Significant Adverse effect during construction, for both the landscape character and the effects to visual receptors.</p>

Scoping topic (including environmental factor*)	Option 1	Option 2
	<p>Option 1 is online or close to the existing A303 alignment, and therefore the implications on the wider landscape and surrounding visual receptors is lessened. It is also felt that Option 1 would be more readily mitigated due to its location.</p> <p>It is considered that there would be a non-significant Slight Adverse effect associated with Option 1 by Year 15 for both landscape character and the effects to visual receptors.</p>	<p>Option 2 traverses an unspoilt expansive vale landscape to the north of the A303 which would result in a detrimental impact on landscape character when operational. Individual visual receptors are also likely to be significantly affected, although details of this would be established further during the next stage of assessment.</p> <p>It is considered that there would be a significant Moderate Adverse effect resulting from Option 2 by Year 15 for both landscape character and the effects to visual receptors.</p>
Biodiversity	<p>The overall significance of effects for each ecological receptor is reliant on mitigation measures being implemented such as appropriate habitat enhancement and creation mitigating effects during operation. The overall on-balance significance of effects on Nature Conservation as a result of Option 1 is Slight Adverse for construction and Neutral for operation.</p>	<p>The overall significance of effects for each ecological receptor is reliant on mitigation measures being implemented such as appropriate habitat enhancement and creation mitigating effects during operation. For Option 2, the overall on balance significance of effects on Nature Conservation as a result of Option 2 is Slight Adverse for construction and Slight Adverse reducing to Neutral once mitigation planting has matured.</p>
Geology and soils (including Human Health)	<p>It is considered that Option 1 has the potential to result in adverse effects upon geology, soils and the associated environment during construction, however with the inclusion of appropriate mitigation measures, construction stage effects on identified receptors are not considered to be significant.</p> <p>Therefore, the on-balance effect is anticipated to be Slight Adverse for the construction phase.</p> <p>The completed and operational scheme is not expected to result in any adverse effects on geology or soils, and therefore Neutral effects are anticipated.</p>	<p>It is considered that Option 2 has the potential to result in adverse effects upon geology, soils and the associated environment during construction, however with the inclusion of appropriate mitigation measures, construction stage effects on identified receptors are not considered to be significant. Therefore, the on-balance effect is anticipated to be Slight Adverse for the construction phase.</p> <p>The completed and operational scheme is not expected to result in any adverse effects on geology or soils, and therefore Neutral effects are anticipated.</p>
Material assets	<p>It is anticipated that the quantity of materials required for Option 1 would be significant, specifically the quantities of materials required for pavement construction, as well as steel and concrete. Mitigation measures would ensure that the re-use / recycling of materials is made a priority, however a potential for Significant Adverse effects on material resources is still anticipated.</p> <p>There is anticipated to be a large quantity of green waste generated during site clearance, however all green material and excavated / cut material will be re-used on-site. Therefore, quantities of waste arisings are not expected to result in</p>	<p>It is anticipated that the quantity of materials required for Option 1 would be significant, specifically the quantities of materials required for pavement construction, as well as steel and concrete. Mitigation measures would ensure that the re-use / recycling of materials is made a priority, however a potential for Significant Adverse effects on material resources is still anticipated.</p> <p>There is anticipated to be a large quantity of green waste generated during site clearance, however all green material and excavated / cut material will be re-used on-site. Therefore, quantities of waste arisings are not expected to result in significant</p>

Scoping topic (including environmental factor*)	Option 1	Option 2
	<p>significant effects, and an on-balance Not Significant Adverse effect is anticipated.</p> <p>The carbon assessment identified the total carbon emissions for Option 1 as 19,082 tCO₂e and the total embodied carbon emissions of the materials as 16,153 tCO₂e.</p>	<p>effects, and an on-balance Not Significant Adverse effect is anticipated.</p> <p>The carbon assessment identified the total carbon emissions for Option 2 as 19,193 tCO₂e and the total embodied carbon emissions of the materials as 16,943 tCO₂e. This larger quantity when compared with Option 1 can be attributed to the greater length.</p>
Noise and Vibration (including Human Health)	<p>During construction, with best practice mitigation measures in place, including communication with relevant authorities and the local community, an on-balance Not Significant Adverse effect is anticipated, for Option 1.</p> <p>There is anticipated to be a small increase in numbers of receptors at or above significant observed adverse effect level with Option 1 in the Opening Year (2023). A small increase would then remain by the Design Year (2038). An overall Not Significant Adverse effect is anticipated.</p>	<p>During construction, with best practice mitigation measures in place, including communication with relevant authorities and the local community, an on-balance Not Significant Adverse effect is anticipated, for Option 2.</p> <p>There is anticipated to be a small increase in numbers of receptors at or above significant observed adverse effect level with Option 2 in the Design Year (2038) only. An overall Not Significant Beneficial effect is anticipated.</p>
People and Communities (including Population and Human Health)	<p>Permanent increases and decreases to journey length and time resulting from changes to non-motorised user facilities (NMU) from the baseline would be likely and result in human health and wellbeing benefits and dis-benefits. Changes to amenity, potential severance to routes connecting to community facilities and impacts to private property have potential to affect people's health and wellbeing.</p> <p>During construction, existing barriers between people and traffic would change resulting in a Slight Adverse effect on amenity. Once in operation, amenity would change in several ways, with barriers between people and traffic changed, changes in flows and provision of new facilities. Option 1 would result in a Slight Beneficial effect on amenity.</p> <p>Several NMU routes connecting to community facilities would experience Slight Adverse effects to journey time and quality during both construction and operation.</p> <p>During operation, Option 1 would result in a Slight Adverse effect due to the demolition of a small number of assumed derelict buildings.</p>	<p>Permanent increases and decreases to journey length and time resulting from changes to non-motorised user facilities (NMU) from the baseline would be likely and result in human health and wellbeing benefits and dis-benefits. Changes to amenity, potential severance to routes connecting to community facilities and impacts to private property have potential to affect people's health and wellbeing.</p> <p>During construction, existing barriers between people and traffic would change resulting in a Slight Adverse effect on amenity. Once in operation, amenity would change in several ways, with barriers between people and traffic changed, changes in flows and provision of new facilities. Option 2 would result in a Slight Adverse effect.</p> <p>A small number of NMU routes connecting to community facilities would experience Slight Adverse effects during both construction and operation however the majority of NMU routes connecting to facilities would not be affected during construction or operation, therefore Option 2 would have a Neutral effect on severance. Option 2 would be likely to result in some new views for vehicle travellers. However, the establishment of vegetation alongside the</p>

Scoping topic (including environmental factor*)	Option 1	Option 2
	<p>Option 1 would be likely to result in some new views for vehicle travellers. However, the establishment of vegetation alongside the new road during Year 1 of operation would gradually screen open views to the wider area in part. An overall Slight Beneficial effect is anticipated for Option 1 with a shift from restricted views to with open views in part from the new road.</p> <p>A Slight Adverse effect is predicted for driver stress due to the temporary presence of traffic management which would cause increases in driver frustration and fear of accidents, although the provision of a Traffic Management Plan would minimise effects on vehicle travellers. During operation, a Moderate Beneficial effect is predicted for both options with vehicle travellers able to drive along the road at a more consistent speed, and improved journey time reliability.</p>	<p>new road during Year 1 of operation would gradually screen open views to the wider area in part. An overall Slight Beneficial effect is anticipated for Option 2 with a shift from restricted views to with open views in part from the new road.</p> <p>A Slight Adverse effect is predicted for driver stress due to the temporary presence of traffic management which would cause increases in driver frustration and fear of accidents, although the provision of a Traffic Management Plan would minimise effects on vehicle travellers. During operation, a Moderate Beneficial effect is predicted for both options with vehicle travellers able to drive along the road at a more consistent speed, and improved journey time reliability.</p>
Road Drainage and the Water Environment	<p>Following the use of standard mitigation measures no significant effects are anticipated on the water environment for Option 2. Mitigation measures will be contained within the CEMP for Land Adjacent to Hazlegrove Park, the historic landfill site adjacent to the north-east of Option 1, to avoid mobilisation of contaminated soil or contaminated runoff in the nearby drainage ditches. The overall on balance significance of effects on the water environment as a result of Option 1 would be Neutral during both construction and operation.</p>	<p>Following the use of standard mitigation measures no significant effects are anticipated on the water environment for Option 2. Mitigation measures will be required for and adjacent to Hazlegrove Park, the historic landfill site crossed by Option 2, to avoid mobilisation of contaminated soil or contaminated runoff in the nearby drainage ditches.</p> <p>The main carriageway of Option 2 would be within 10m-185m of the Dyke Brook flood plain and the embankment of the new Steart Bridge would be within the flood plain (Flood Zone 2 along Dyke Brook). Compensatory flood storage would be provided if required, to ensure no increase in flood risk elsewhere. This would therefore be a Neutral effect.</p> <p>The overall on balance significance of effects on the water environment as a result of Option 2 would be Neutral during both construction and operation.</p>
Climate	<p>Overall, effects on climate are anticipated to be Not Significant Adverse during construction, for Option 1.</p> <p>During operation, effects on climate are anticipated to be Neutral.</p>	<p>Overall, effects on climate are anticipated to be Not Significant Adverse during construction, for Option 2.</p> <p>During operation, effects on climate are anticipated to be Neutral.</p>
Combined and Cumulative effects (including the	<p>In terms of combined effects, a Not Significant Adverse effect was reported during both construction and operation for Option 1, with no additional mitigation measures required.</p>	<p>In terms of combined effects, a Not Significant Adverse effect was reported during both construction and operation for Option 2, with no additional mitigation measures required.</p>

Scoping topic (including environmental factor*)	Option 1	Option 2
interaction between environmental factors).	In terms of cumulative effects, a Not Significant Adverse effect was reported during both construction and operation, taking into consideration proposed developments within the study area. Therefore, no additional mitigation measures were required.	In terms of cumulative effects, a Not Significant Adverse effect was reported during both construction and operation, taking into consideration proposed developments within the study area. Therefore, no additional mitigation measures were required.

*Note that the topic of Climate was included within the DMRB Simple level of assessment as it was a new requirement of the Infrastructure Planning (EIA) Regulations 2017

3.6 Design evolution of the preferred option

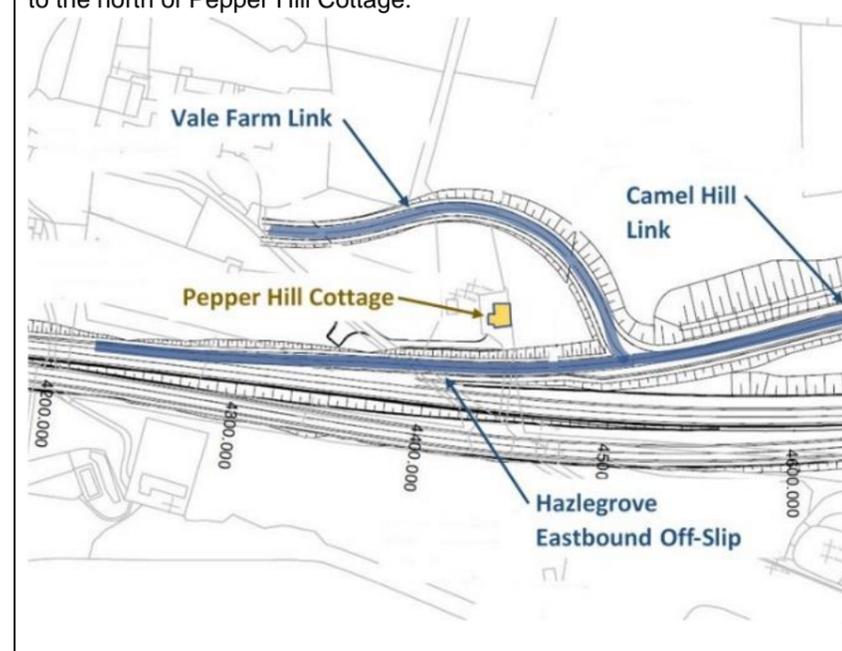
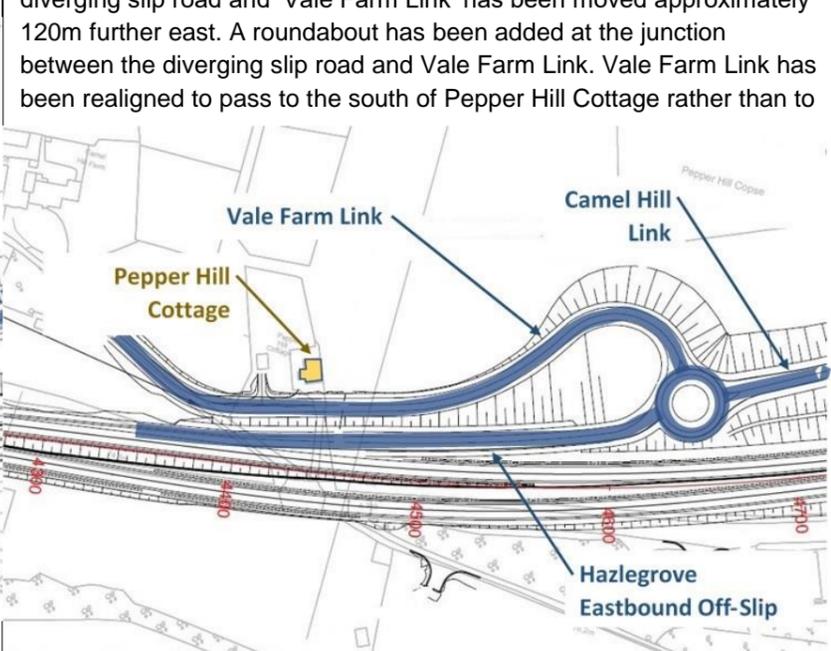
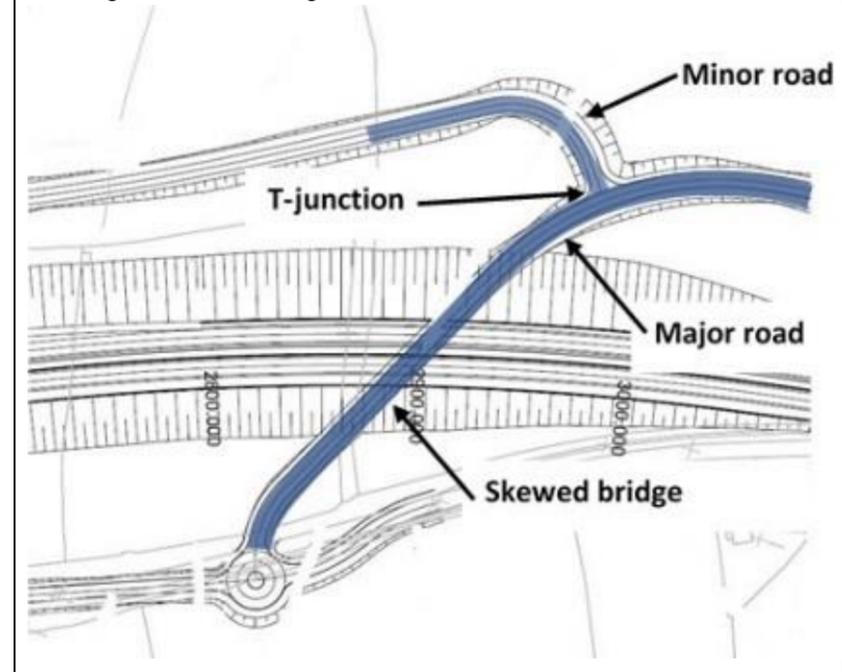
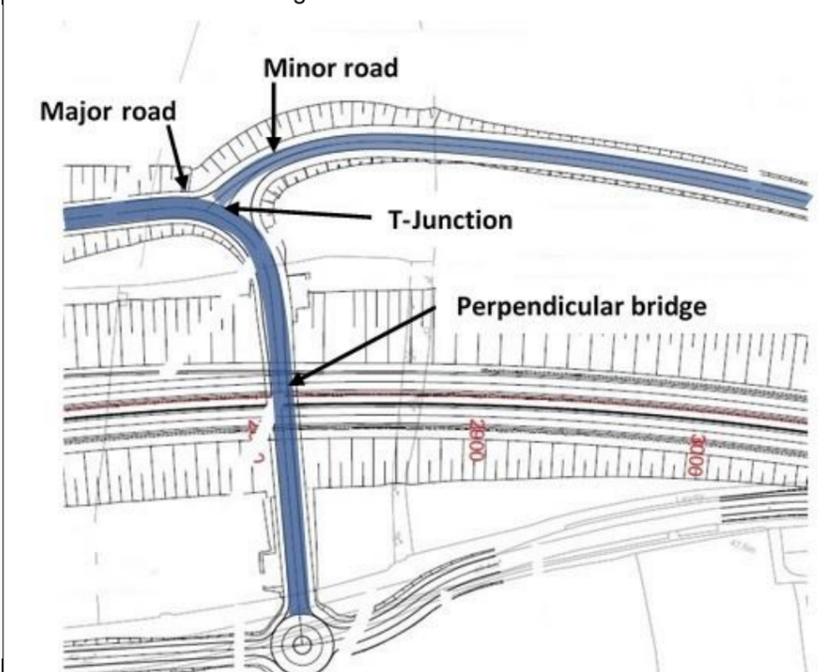
3.6.1 A scheme design for the preferred option was presented at Statutory Consultation which took place in January to March 2018.

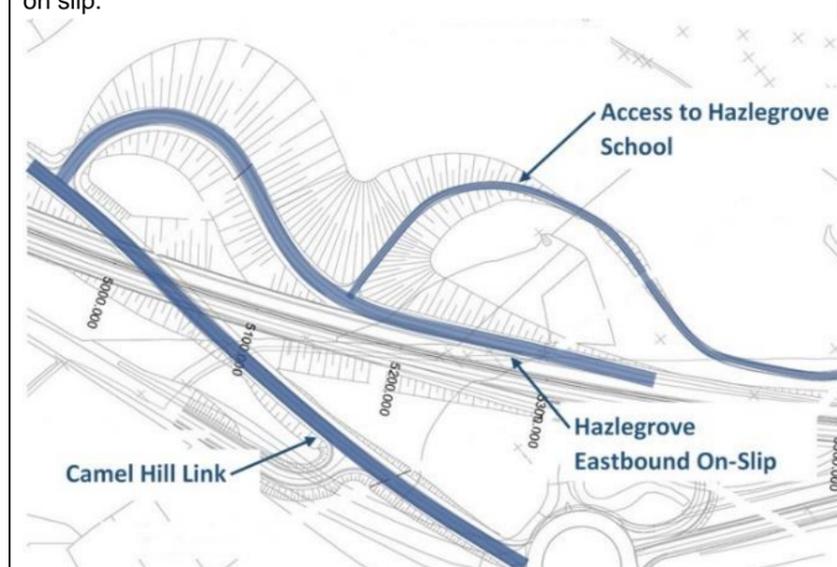
3.6.2 The scheme design presented at Statutory Consultation consisted of the following principal elements:

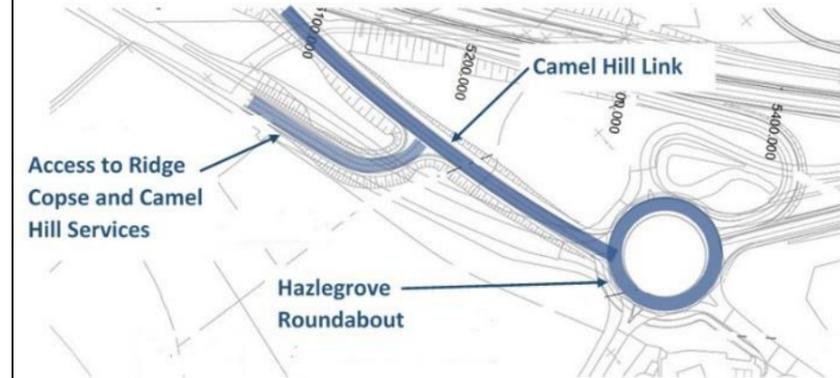
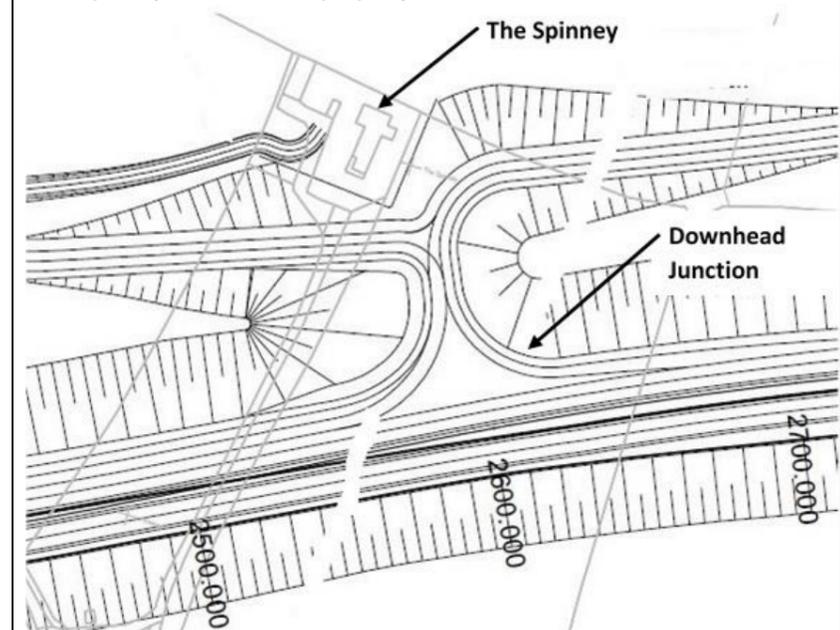
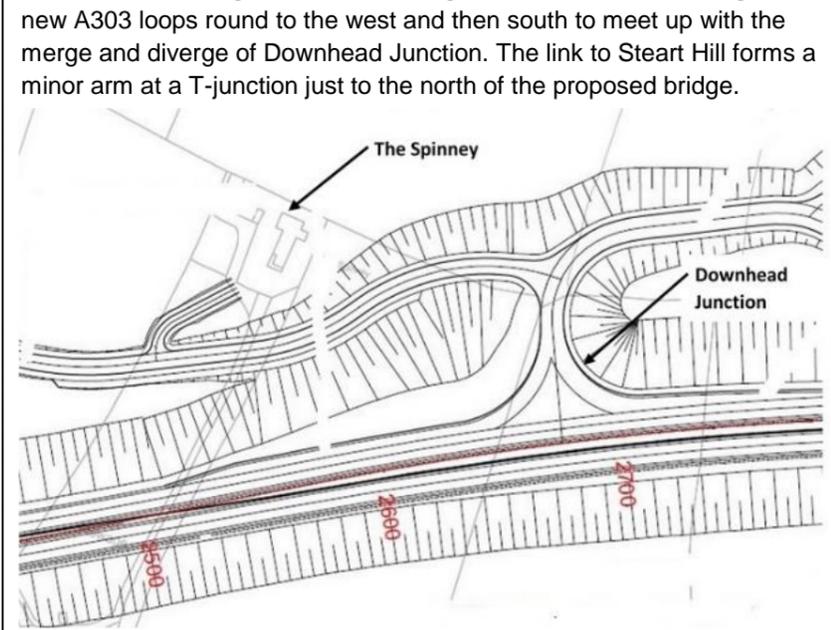
- A new length of dual 2-lane carriageway highway between Sparkford and Podimore, deliberately aligned to the side of the existing carriageway in places, to allow use of the existing route for local access.
- A new all movements grade-separate junction north-west of Hazlegrove Roundabout accommodating free-flowing A303 traffic movements.
- A limited movement junction in the vicinity of Downhead.
- A connection between local roads to the north and south of the route in the vicinity of Canegore Corner via an overbridge.
- Closure of the existing westbound slip road to Podimore village. Access to Podimore village via the A303 / A37 junction (Podimore Roundabout).

3.6.3 The design has evolved following completion of the Statutory Consultation, as well as a result of discussions with environmental bodies during the Environmental Technical Working Group (TWG) (meeting minutes are contained within Appendix 4.9 of Volume 6.3), to take account of feedback received as part of this consultation, including amendments to the size, scale and location of junctions. No reasonable alternatives in technology were available, due to the nature of the scheme which does not require any communications. Table 3.3 details the key features of the design presented at Statutory Consultation, as well as the current design, which is described in detail within Chapter 2 The Scheme of Volume 6.2. Table 3.2 also describes the likely environmental effects associated with those features that are different from the proposed scheme.

Table 3.3: Design variations of the preferred option

Design presented at statutory consultation	Revised design	Summary of environmental effects
Hazlegrove Junction eastbound off slip / Vale Farm Link:		
<p>The junction between the diverging slip road and Vale Farm Link was 120m further west, towards Pepper Hill Cottage. Vale Farm Link passed to the north of Pepper Hill Cottage.</p> 	<p>The commencement of the eastbound diverging slip road has been moved approximately 120m further east. The junction between the diverging slip road and 'Vale Farm Link' has been moved approximately 120m further east. A roundabout has been added at the junction between the diverging slip road and Vale Farm Link. Vale Farm Link has been realigned to pass to the south of Pepper Hill Cottage rather than to</p> <p>the north.</p> 	<p>Cultural Heritage</p> <ul style="list-style-type: none"> Pepper Hill Cottage is identified as a local heritage asset within the cultural heritage assessment. The location of Vale Farm Link would have enclosed Pepper Hill Cottage between highways, which would have divorced the cottage from its agricultural setting. The revised design would ensure that this does not occur. <p>Landscape</p> <ul style="list-style-type: none"> The location of Vale Farm Link would have resulted in the severance of Pepper Hill Cottage from the wider landscape character, resulting in adverse effects to the setting of cottage. The revised design minimises this adverse effect. The alignment of the Vale Farm Link would have required removal of vegetation on 3 aspects of the cottage, causing short term visual effects whilst newly planted vegetation established, and which does not occur with the revised design. <p>Biodiversity</p> <ul style="list-style-type: none"> The Vale Farm Link would have created a barrier to the wider landscape and also required vegetation removal. Species that would have been particularly impacted are bat species, with bat roosts present within the vicinity of the cottage grounds. This vegetation removal is not required for the revised design. <p>People and Communities</p> <ul style="list-style-type: none"> The Vale Farm Link would have required the permanent acquisition of the property's garden and part of the current access route to the property. The revised design reduces the extent of permanent acquisition.
Stear Hill Overbridge:		
<p>The angle of the overbridge was skewed.</p> 	<p>The skew of this overbridge has been reduced.</p> 	<p>Air Quality</p> <ul style="list-style-type: none"> The skewed nature of the Stear Hill Overbridge would have resulted in vehicles being closer in the receptor (Crusty Cottage, to the east) and therefore higher concentrations of NO₂ and PM₁₀ when compared with the proposed scheme. The revised design minimises this adverse effect by moving vehicles away from the receptor. <p>Noise</p> <ul style="list-style-type: none"> The skewed nature of the Stear Hill Overbridge would have resulted in vehicles being closer to receptors along Plowage Lane when compared with the proposed scheme. The revised design minimises this adverse effect by moving vehicles away from the receptor.

Design presented at statutory consultation	Revised design	Summary of environmental effects
Hazlegrove Junction eastbound on slip / Hazlegrove School access:		
<p>Hazlegrove School access was proposed from the end of the eastbound on slip.</p> 	<p>Hazlegrove School access has been removed from the end of the eastbound on slip. It is now located off the 'Camel Hill Link'.</p> 	<p>Cultural Heritage</p> <ul style="list-style-type: none"> • This alignment would have physically impacted Hazlegrove House RPG due to the greater extent of land take and subsequent removal of the park and garden. The footprint of the Hazlegrove Junction has been considerably condensed towards the woodland and arable field in the south-western corner of the park, to reduce the land take and thus reduce the impact on the historic parkland. • The engineered nature of the slopes and extent of the earthworks would have been contrary to the character of the RPG. The revised design and associated earthworks reduces this adverse effect. • The nature of the junction arrangement would have been more prominent in views looking south west from Hazlegrove House when compared with the proposed scheme. The revised design reduces these adverse visual effects. • The complexity of the junction layout would have made it more prominent in the historic landscape when compared with the proposed scheme. The complexity of the junction has been reduced and therefore the associated earthworks, allowing better integration into the existing landscape. • By having the access off the slip-road the school driveway would have been given less prominence than it should have. The current design reduces this adverse effect on historic setting. <p>Landscape</p> <ul style="list-style-type: none"> • This alignment would have physically impacted a substantial amount of the southern part of Hazlegrove House RPG due to the extent of land take and subsequent removal of the park and garden, when compared to the proposed scheme. The footprint of the Hazlegrove Junction has been considerably condensed towards the woodland and arable field in the south-western corner of the park, to reduce the land take and thus reduce the impact on landscape and visual effects. • The extent of earthworks and steep gradients of proposed slopes would have been difficult to integrate into the landscape and provide adequate screening in the form of false cuttings and landscape bunds, and also would have proposed difficulties in terms of planting. The current design has allowed for greater integration and therefore reduced adverse effects. • This junction would have required more permanent land take which could not have been reinstated as parkland due to the steep gradients and footprint of the junction. The revised scale of the junction allows for a larger amount of parkland to be reinstated. <p>Biodiversity</p> <ul style="list-style-type: none"> • The junction arrangement presented greater habitat loss when compared to the proposed scheme. The revised design minimises this adverse effect. <p>People and Communities</p> <ul style="list-style-type: none"> • Non-Motorised Users (NMUs) would have a different journey length when compared to the proposed scheme.

Design presented at statutory consultation	Revised design	Summary of environmental effects
<p>Access to Camel Hill Services</p> <p>Access to the former A303 Camel Hill, ridge copse and the Camel Hill Services was provided by the inclusion of a T-junction on the 'Camel Hill Link' approximately 120m from Hazlegrove Roundabout.</p> 	<p>The way in which the Camel Cross junction connects to the local road network has been altered. Now, the former A303 and the B3151 form a continuous local road, with the merge and diverge of the new Camel Cross junction connecting to this local road as the minor arm of a new T-junction approximately 115m south of the new A303.</p> 	<p>Landscape</p> <ul style="list-style-type: none"> The shallow angle of Camel Hill Link would have resulted in the need for lighting in a currently unlit area, when compared to the preferred scheme. The current design eliminates the need for lighting in this area, reducing adverse effects. <p>Biodiversity</p> <ul style="list-style-type: none"> This alignment would have resulted in more habitat loss as the access to Ridge Copse and Camel Hill Services would require loss of woodland to the south. The revised design minimises this adverse effect by reducing the area of habitat loss.
<p>Downhead Junction:</p> <p>The merge and diverge associated with Downhead Junction adjacent to The Spinney, a residential property.</p> 	<p>The priorities between the local roads at the junction just to the north of Steart Hill Overbridge have been changed. The local road crossing the new A303 loops round to the west and then south to meet up with the merge and diverge of Downhead Junction. The link to Steart Hill forms a minor arm at a T-junction just to the north of the proposed bridge.</p> 	<p>Air Quality</p> <ul style="list-style-type: none"> The merges and diverges associated with Downhead Junction were closer and therefore vehicles would have been located closer to The Spinney, resulting in greater concentrations of NO₂ and PM₁₀. The revised design minimises this adverse effect by moving vehicles away from the receptor. <p>Noise</p> <ul style="list-style-type: none"> The merges and diverges associated with Downhead Junction were closer and provided a greater line of sight from The Spinney to the scheme. The revised design minimises this adverse effect by moving vehicles away from the receptor. <p>Cultural Heritage</p> <ul style="list-style-type: none"> The Spinney has been identified as a local heritage asset within the cultural heritage assessment. The complexity of the proposed Downhead Junction would have resulted in the road being a dominant feature around the property which would have had a greater adverse effect on the setting of The Spinney when compared to the preferred scheme. <p>Landscape</p> <ul style="list-style-type: none"> The junction's proximity to The Spinney and the removal of existing screening vegetation around the property along the southern and eastern boundaries would have resulted in short distance visual effects that would have been more adverse in comparison to the preferred scheme, whilst the vegetation established. <p>Biodiversity</p> <ul style="list-style-type: none"> There is a known bat roost at The Spinney. The proximity of the junction arrangement would have presented adverse effects to these bat species. The new design reduces these adverse effects. <p>People and Communities</p> <ul style="list-style-type: none"> The junction would have required a greater amount of permanent land take from The Spinney, and the potential to affect an additional building to the west of The Spinney. This included a garden to the south of the property and an access / route to the south of the Spinney likely to be frequently used. The revised design reduces these adverse effects.

3.7 Justification for chosen option

- 3.7.1 In summary, a total of 13 potential route options were originally identified to ensure a wide range of possibilities were considered. Using the EAST, these options were initially sifted for their best fit against specific strategic, economic, managerial, financial and commercial criteria. The 13 options were reduced down to 11 options at Phase 1 (strategic fit) of the sift, and then further reduced to 4 options following Phase 2 of the EAST sift. A high level environmental assessment was undertaken to inform the EAST sifting criteria. In order to provide sufficient variety to obtain a broad range of opinion from stakeholders and the public, 4 options were shortlisted; Option A2, Option B4, Option E4 and Option F1. Following this, the environmental effects of scheme options were assessed to a DMRB Scoping Level f, and this information helped to inform the decision on which of the central and northern options were taken forward.
- 3.7.2 As a result of the assessment and appraisal work, it was concluded that 1 central and 1 northern route option should be taken forward to the non-statutory public consultation which was held in February and March 2017. These 2 options were Option 1 (renamed from Option A2) and Option 2 (renamed from Option F1). Option 1 and Option 2 were subsequently subject to further environmental, economic, and technical assessment.
- 3.7.3 The preferred option was announced in October 2018. Option 1 was chosen over option 2 primarily because it was favoured by those who responded to the statutory consultation held in January to March 2018. Option 1 also minimises land take, reduces journey times and subsequent carbon emissions, reduces the impact on Hazlegrove House RPG, reduces the amount of construction in an unspoilt rural setting, has a reduced adverse effect on the landscape character and visual effects, and has a slightly lower impact on biodiversity.
- 3.7.4 Following the presentation of the proposed Option 1 at Statutory Consultation in January to March 2018, the scheme design evolved as a result of the feedback received and through discussions with consultees as part of the TWGs. Amendments were made to the locations, scale and size of scheme aspects, such as junctions, which reduced the number of adverse effects associated with factors such as landscape, cultural heritage, biodiversity, noise and air quality.