



A358 Taunton to Southfields Dualling Scheme

Technical Appraisal Report

Updated February 2018

Technical Appraisal Report – List of Amendments

The following changes have been made since the version issued in January 2018.

Corrections

Version	Page	Paragraph/Table/Figure	Comment
January 2018	165	Table 8.5	The column “Orange option (via J25A) - Difference (min:sec)” has been reformatted to show times in minutes and seconds. The previous version had been formatted to show percentages in error.
January 2018	212	Appendix B2- Shortlisted Options	Junctions had been positioned incorrectly, the map has been updated to reflect correct positions.
February 2018	206	Paragraph 17.1.1	BCR description changed from good to high. Good was stated in error.

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Executive Summary

Introduction

The A358 Taunton to Southfields scheme is part of a programme of improvements planned along the A303 / A358 corridor aimed at improving connectivity between London and the south east and the south west. The programme, as set out in the Government's Road Investment Strategy (www.gov.uk/government/collections/road-investment-strategy), will create a continuous high quality dual carriageway along the route by upgrading all the existing single carriageway sections.

The A358 is located in the county of Somerset in the Taunton Deane and South Somerset Districts. It passes through a predominantly rural area consisting mainly of arable and livestock farmland and through the civil parishes of Ruishton, Thornfalcon, West Hatch, Hatch Beauchamp, Bickenhall, Ashill and Horton. The A358 and A303 route suffers traffic congestion and poor journey time reliability, particularly at peak holiday times in the summer months and at weekends when many are journeying to and from the south west. The upgrades to the A358 corridor will help alleviate these issues.

Purpose and Context of the Technical Appraisal Report

This Technical Appraisal Report (TAR) reports on the existing problems and constraints along the A358 between Taunton and Southfields Roundabout on the A303, near Ilminster. The TAR reports on potential solutions for this A358 scheme, detailing the identification, sifting and appraisal of route options to determine which should be taken forward for Public Consultation.

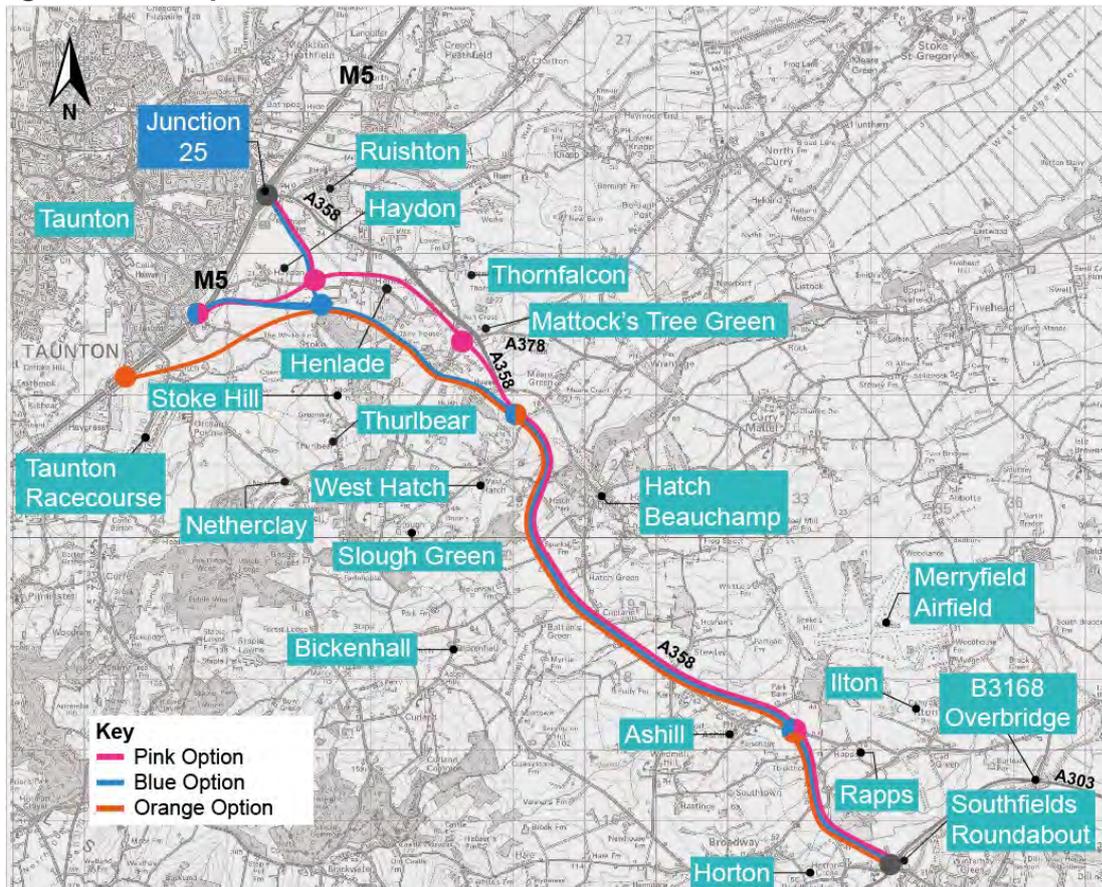
This TAR is an update of the previous version dated March 2017 (published April 2017), published at the time of the initial public consultation held between 28 March and 16 July 2017. Much of the content is the same as the previous version, but some revisions have been made, including a more comprehensive discussion of the long list of 28 potential options for upgrading the A358 (Section 5) and how these were narrowed down to a short list of 4 options (Section 6). These 4 options that were then appraised in greater detail prior to a single route option being taken forward for the 2017 consultation.

A strong feedback theme from the initial consultation was a wish to see more options for connecting with the M5, for providing traffic relief for Henlade, and for connecting more directly with the future 'Nexus 25' development, a major new employment site planned in the south-east quadrant of the existing junction 25. Highways England has carefully considered this feedback and has made the decision that it would be beneficial to reconult and seek views on more options for routing the upgraded A358 past Henlade, with accompanying options for connecting the M5, before making a decision on the choice of preferred route. 3 options are being put forward for further consultation as summarised below.

Options for reconsultation

From the 4 options shortlisted in the 2017 TAR (dated March 2017), one was subsequently discounted because it would have significantly greater environmental impacts on landscape and biodiversity than the other 3 options. Those 3 options are now being put forward for consultation. The 3 options being put forward for consultation are the Pink option, Blue option and the Orange option, as shown below on Figure 0.1.

Figure 0.1 Option routes



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Description of Options

Pink option

Starting from the west, the Pink option commences from a new junction on the M5 approximately 1.2 miles (2 kilometres) south of junction 25. South-facing slip roads from the M5 would combine to become the new dual carriageway, which runs eastwards and north of Stoke Hill. Here a limited-movement junction is proposed with east-facing slip road connections to the new road which would allow traffic to travel between the new A358 and junction 25 via a new 0.9 mile (1.5 kilometre) dual carriageway link past the planned Nexus 25 site.

The route then continues in a south-easterly direction to Mattock's Tree Green where an all-movement, grade-separated junction is proposed which would allow access to Hatch Beauchamp, Henlade and surrounding communities, and A378.

The proposed route would then follow the existing A358 to Southfields Roundabout enabling the existing road to be upgraded from a single to a dual carriageway.

An additional all-movement grade separated junction is proposed near to Ashill to access Ashill, Ilton and surrounding communities.

The total length of the Pink option is 9 miles (14.6 kilometres), plus the 0.9 miles (1.5 kilometres) spur leading to M5 junction 25.

Blue option

Like the Pink option, the Blue option commences at the M5 approximately 1.2 miles (2 kilometres) south of junction 25 and runs eastwards on a more southerly alignment. At Stoke Hill a junction is proposed similar to that with the Pink option which would allow traffic to travel between the road and junction 25 via a new 1.2 miles (2 kilometres) dual carriageway link past the planned Nexus 25 site. The road would then continue in a south easterly direction to West Hatch Lane, where an all-movement, grade-separated junction is proposed which would allow access to Hatch Beauchamp, Henlade and surrounding communities, and A378.

This option is identical to the Pink option from this point onwards to Southfields Roundabout.

The total length of the Blue option is 8.7 miles (14.1 kilometres), plus the 1.2 miles (2 kilometres) spur leading to M5 junction 25.

Orange option

The Orange option commences at the M5 approximately 2.1 miles (3.5 kilometres) south of junction 25 at a proposed new 2-bridge roundabout which would form a new all-movements junction between the new A358 and the motorway. The proposed road initially takes a north-easterly course towards Henlade before arcing around the north of Stoke Hill. In contrast to the Blue option, there is no link to junction 25 from this location, and therefore no junction at Stoke Hill.

This option is identical to the Blue option from this point onwards.

The total length of the Orange option is 9.5 miles (15.3 kilometres).

Design standards

The Government's strategy is for the A303 / A358 corridor to be upgraded to become a high quality dual carriageway. The route options have been designed accordingly. It is also expected that the upgraded road will become an abnormal and indivisible load (AIL) route, with corresponding headroom clearances for overbridges.

The junction strategy is provisional at this stage, to be refined during subsequent stages. The provisional strategy assumes that all junctions will be grade-separated (with the exception of the connection into Southfields Roundabout), but will be subject to review in subsequent stages. The junctions for the Pink and Blue option at the M5 will be grade separated, even though they do not provide a full range of movements.

For this scheme, Southfields Roundabout will be slightly modified to accommodate the new A358 dual carriageway connecting into the roundabout, with no change to any of the other arm arrangements. The upgrading of Southfields Roundabout will be pursued as part of a future A303 South Petherton to Southfields scheme to upgrade the single carriageway Ilminster Bypass to dual carriageway, as part of the overall improvement programme for the A303 / A358 corridor.

Traffic appraisal

Analysis of Annual Average Daily Traffic (AADT) shows flow differences on the new A358 to the east of the M5 between the Blue option (45,900 2-way flow in 2038) and the Orange option (26,000 2-way flow in 2038). The difference in AADT is due to the presence of the link onto junction 25 in the Blue option which attracts Taunton traffic to the new scheme whereas in the Orange option this traffic remains on the existing A358 through Henlade. The Pink option attracts the most traffic to the new A358 (54,600 2-way flow in 2038), with the majority of this traffic (73%) travelling to and from the M5 north and Taunton via the new link to junction 25, and the remainder (27%) using the new free-flow slip roads with the M5 south. The higher AADT in the Pink option, when compared with the Blue option, is due to the Pink option being able to attract additional traffic from the A378 given the location of a proposed new junction adjacent to the A378.

All journeys between the M5 and Southfields show substantial journey time savings for the scheme options when compared with the journey times in 2038 without a scheme improvement, referred to as the Do Minimum scenario.

Economic appraisal

An economic appraisal has been carried out in accordance with the Department for Transport's web-based *Transport Analysis Guidance* (WebTAG), with the results of the appraisal presented in Table 0.1.

Table 0.1: Analysis of Monetised Cost Benefits (£000's)

Item	Pink option	Blue option	Orange option
Accidents (not assessed by TUBA) ¹	10,184	9,666	-314
Roadworks (not assessed by TUBA) ²	-58,676	-54,691	-54,916
Greenhouse Gases (not assessed by TUBA) ³	-18,969	-16,589	-21,791
Noise (not assessed by TUBA) ⁴	493	2204	-837
Air Quality (not assessed by TUBA) ⁵	-136	180	71
<hr/>			
Economic Efficiency: Consumer Users (Commuting)	122,843	108,557	95,830
Economic Efficiency: Consumer Users (Other)	159,928	127,916	98,781
Economic Efficiency: Business Users and Providers	283,355	239,090	200,801
Wider Public Finances (Indirect Taxation Revenues)	30,474	28,412	33,533
Present Value of Benefits (PVB)	529,496	444,745	351,158
<hr/>			
Broad Transport Budget / Present Value of Costs (PVC)	284,094	266,270	243,851
<hr/>			
OVERALL IMPACTS			
Net Present Value (NPV)	245,401	178,475	107,307
Initial Benefit to Cost Ratio (BCR)	1.864	1.670	1.440
<hr/>			
Reliability Benefits	62,375	53,621	47,738
Adjusted BCR	2.084	1.872	1.636

Notes: All monetary values are expressed in 2010 prices discounted to 2010. TUBA refers to the economic appraisal software Transport User Benefit Appraisal. 1 - From COBALT; 2 - From QUADRO; 3 - TAG Unit A3 Chapter 2; 4 TAG Unit A3 Chapter 3; 5 - TAG Unit A3 Chapter 4. These methods are discussed later in the report.

Safety assessment

All three options would provide an inherently safer dual carriageway route than the existing single carriageway with its many T-junctions and direct accesses and rights-of-way crossings which would be removed from the new dual carriageway. The Pink and Blue options would attract more traffic off the existing A358 through Henlade and, in doing so, would secure greater reductions in accidents on the interacting local roads.

Buildability and maintenance

A buildability and maintenance assessment also concluded that none of the options would be more complex to build or maintain than any of the others.

Environmental and social assessment

For noise, air quality and greenhouse gases, the quantitative value comparison between the 3 options is presented in Table 0.1 above.

Within the online corridor, the 3 options have the same effect on the landscape. Between the online section and the tie-in to the M5, the Pink option has a lower effect on landscape compared to the Blue and Orange options as it remains closer to the existing A358 for longer. The Blue option would intrude on the countryside south and west of Henlade and the Orange option would intrude on the countryside south of Henlade and west of Stoke St Mary. The Pink option is considered overall to have a lesser effect on the landscape than the Blue and Orange options, which are considered to have an equal effect.

There is some potential for the scheme to have impacts on buried archaeology and on heritage assets such as listed buildings. The risks have been reduced by the choice of route alignments and there is nothing to discriminate significantly between the options.

Potential adverse effects for biodiversity have been reduced where possible, by aligning the footprint of the options along or close by the existing A358 for much of the corridor. Mitigation measures to avoid or reduce impacts will be incorporated into design of the scheme along the chosen preferred route. 5 Local Wildlife Sites could be affected by the Pink option, 6 Local Wildlife Sites and an area of ancient woodland could be affected by the Blue option and 6 Local Wildlife Sites, 1 Local Nature Reserve and an area of ancient woodland could be affected by the Orange option.

The social assessment results also differ for each of the options, but overall the Pink and Blue options perform the best for commuting and other user, reliability impact on commuting and other users and accidents topics.

Engagement with stakeholders and the way forward

Engaging with stakeholders has been an integral element of the scheme development process.

Workshops have been attended by representatives from:

- Local Authorities: Somerset County Council, South Somerset District Council and Taunton Deane Borough Council
- Statutory environmental bodies: Environment Agency, Natural England and Historic England
- Non-statutory bodies, the National Trust and the South West Heritage Trust, who have particular interests in this area

This and wider engagement has made an essential contribution to the development of route options and the decision to reconsult, following the views expressed in the 2017 public consultation.

1. Introduction

1.1. Background to this report

- 1.1.1. This Technical Appraisal Report (TAR) on the A358 Taunton to Southfields dualling scheme is an update of the previous version, dated April 2017, published at the time of the initial non-statutory public consultation held between 28 March and 16 July 2017. Much of the content is the same as contained in the previous version; however, some revisions have been made, including additional sections (Sections 5 to 7) which explain how a long list of 26 potential options for upgrading the A358 were narrowed down to a short list of 4 options that were then appraised in greater detail, prior to a single route option being taken forward for the initial 2017 consultation.
- 1.1.2. A strong feedback theme from the initial 2017 consultation was a wish to see more options for connecting with the M5, for providing traffic relief for Henlade, and for connecting more directly with the future 'Nexus 25' development (a major new employment site planned in the south-east quadrant of the existing M5 junction 25). This feedback has been carefully considered and has informed the decision that it would be beneficial to reconsult and seek further views on the whole scheme with alternative options being presented.
- 1.1.3. This updated TAR (January 2018) is the version now published in support of the 3 scheme options being put forward for further consultation from 16 January to 27 February 2018.

1.2. Purpose of the report

- 1.2.1. This TAR reports on the existing problems and constraints along the A358 between Taunton and Southfields, near Ilminster. Building on previous studies, the TAR reports on potential alternative sustainable solutions for this A358 scheme, detailing the identification, sifting and appraisal of route options to determine which should be taken forward for Public Consultation.
- 1.2.2. The purpose of the TAR is to:
 - Validate the need for the scheme under the terms of reference set out in Highways England's Planning Brief for the scheme
 - Identify and appraise sustainable options following the Department for Transport's (DfT) Transport Analysis Guidance (TAG)
 - Describe, with relevant detail, alternative route options investigated and set out reasons for rejection of any of those alternatives
 - Recommend options for the public consultation
- 1.2.3. There is a wider strategic context to this scheme which is described below, to set the scene for the TAR.

1.3. Wider context

1.3.1. The A303 / A358 / A30 route provides vital east-west connectivity between London and the south west as shown in Figure 1.1 below.

Figure 1.1: Road Corridors



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1.3.2. The A303 runs for approximately 95 miles (153 kilometres) from junction 8 of the M3 near Basingstoke towards Taunton and Exeter. After 85 miles (137 kilometres), the A303 reaches Ilminster and the Southfields Roundabout junction with the A358, which then continues for some 8.7 miles (14 kilometres) to Taunton and junction 25 of the M5. The A303 continues towards Exeter, passing through the Blackdown Hills Area of Outstanding Natural Beauty (AONB). About 6.2 miles (10 kilometres) before Honiton it joins the A30 and then continues as the A30 for some 14.3 miles (23 kilometres) to junction 29 with the M5 at Exeter. From here the A30 continues for another 112 miles (181 kilometres) to Penzance.

1.3.3. As well as serving long distance traffic, the A303 also serves intermediate regional destinations via connecting major north-south routes, including:

- **A34 trunk road** which runs between Southampton and the Midlands, carrying considerable freight traffic to and from the port
- **A338 principal road** which runs from Bournemouth, via Salisbury, towards Marlborough and Swindon
- **A36 trunk road** which links Southampton and Salisbury with Warminster, Trowbridge and onwards to Bath and Bristol

- **A350 principal road** which runs from Poole, via Blandford Forum, Shaftesbury and Warminster, towards Trowbridge and on to Chippenham
 - **A37 principal road** which connects Weymouth, Dorchester and Yeovil to Bristol
- 1.3.4. The A303 also has an important local function, providing access to various small and medium sized settlements along the route.
- 1.3.5. The A303 'spine', and its wider network connections, are therefore vital to the economic prosperity of the south west by enabling the efficient movement of people and goods. However, current levels of service do not reflect the importance of the route as part of the Strategic Road Network (SRN). In particular there are several single carriageway sections (totalling more than 34 miles (55 kilometres)) where customers suffer unreliable journeys, with long delays and an increased risk of accidents. Congestion problems are acute on weekends and during summer months, when over an hour can be added to a typical journey from London to Exeter. Frustrations are great for many of the 6 million visits to the south west made annually via the A303 by residents of London and the south east, as well as many of the 2 million overseas visitors to the region.
- 1.3.6. With the south west economy needing better levels of transport service, the region's Councils and Enterprise Partnerships have been calling for improvements to be made. They believe such improvements could create more than 20,000 jobs and generate more than £40bn Gross Value Added (GVA) contribution over 60-years.

Improved connectivity to the south west

- 1.3.7. Recognising the importance of the A303 / A358 / A30 corridor and the problems along it, the Government has committed in its Road Investment Strategy (RIS) (<https://www.gov.uk/government/publications/road-investment-strategy-for-the-2015-to-2020-road-period>) to create a continuous high quality dual carriageway to the south west via the A303 / A358. This will transform connectivity to and from the south west, providing a consistent and dependable service to customers. A key aim is to achieve 'mile a minute' journey times by creating free-flowing traffic conditions along the whole route.
- 1.3.8. The strategy involves upgrading the entire A303 / A358 route between the M3 and the M5 at Taunton to dual carriageway standard and upgrading junctions to remove congestion bottlenecks. A series of 8 major improvement schemes along the A303 / A358 have been identified as part of an overall investment package for the entire corridor. The 8 schemes along the A303 / A358 route are illustrated in Figure 1.2 below.

Figure 1.2: Schemes to deliver improved connectivity to the south west

1.3.9. Within the RIS, 3 major improvements have been prioritised:

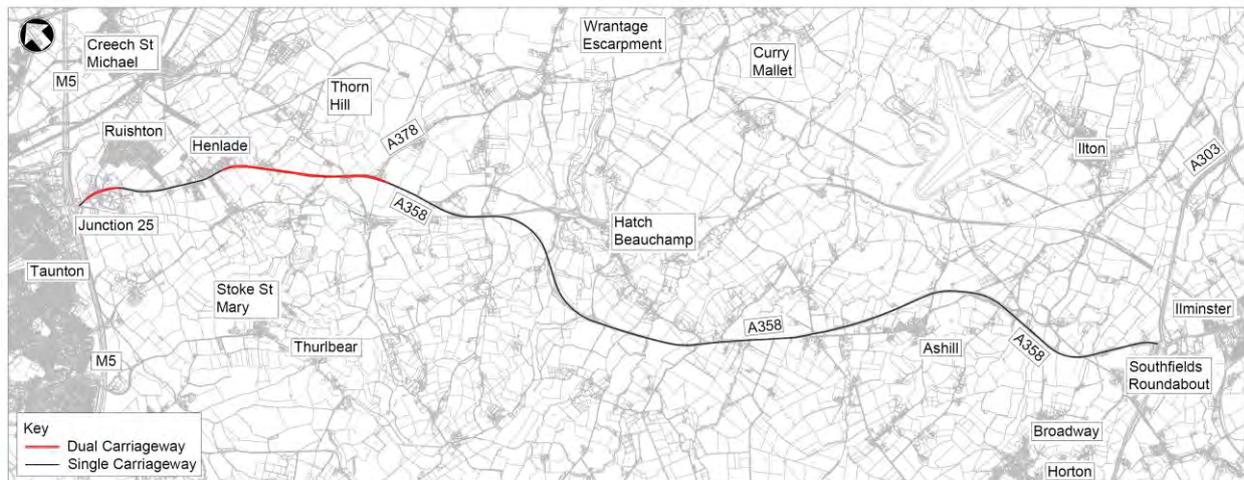
- Dualling the A358 between the M5 at Taunton and Southfields Roundabout
- Dualling the A303 between Sparkford and Ilchester
- Dualling the A303 between Amesbury and Berwick Down past Stonehenge

1.3.10. It should be noted that in deciding to improve the corridor to the south west via the A358, the Government decided not to extend the upgrading via the alternative A303 / A30 corridor from Ilminster to Honiton and Exeter. This section of A303 / A30 passes through the Blackdown Hills Area of Outstanding Natural Beauty (AONB) and the impacts of large-scale road-building were deemed unacceptable within the AONB. Instead the Government, in the RIS, has committed to undertaking smaller-scale improvements along this section to improve safety and journey quality for users.

1.3.11. This TAR focusses on options for creating a dual carriageway on the A358 between the M5 at Taunton and the Southfields Roundabout near Ilminster.

1.4. Scheme overview

1.4.1. The A358 between the M5 at Taunton and Southfields Roundabout is shown on Figure 1.3 below. As well as experiencing high levels of congestion, there are several locations along the A358 where clusters of accidents have been reported. The accident types were predominantly shunts, vehicles turning in or out of local minor roads or head-on collisions. In addition, a number of Public Rights of Ways (PRoWs), undesignated paths and cycle routes are severed by the existing road.

Figure 1.3: A358 existing road layout

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1.4.2. The A358 in this location is currently maintained and managed by Somerset County Council. A previous scheme which considered dualling of existing sections of the A358 between South Petherton and Taunton was promoted by the Highways Agency (now Highways England) in 2006-07 and was taken to public consultation but not progressed further.

1.5. Scheme description

1.5.1. The proposed scheme will provide a dual carriageway between the M5 motorway at Taunton and the A303 at Southfields Roundabout. It is likely to include grade-separated junctions and, with the purpose of providing a high-quality free-flow journey for those using the route, the removal of at-grade junctions and direct accesses.

1.6. Report structure

1.6.1. This report follows the guideline contents structure suggested in Annex A of the Guidance on Technical Appraisal Report and is divided into the following sections:

- Section 1: Introduction
- Section 2: Planning brief – identifying Highways England's scheme objectives, transport objectives, operational objectives and organisational objectives
- Section 3: Existing conditions – describing the existing A358 between Taunton and Southfields Roundabout in terms of the locality, climate, topography, environment, existing highways network, traffic, accident and journey time data, drainage, utilities and accessibility issues

-
- Section 4: Planning factors – identifying the constraints to the scheme at the current stage of the scheme process, the relevant international and national legislation and policy, both local and national
 - Section 5: Identification of route options – identifies and describes all options considered as possible solutions
 - Section 6: Options sifting – describes how the long list of the initial options was reduced from the original 28 options to 4 options and then 1 option for the 2017 public consultation. The section then describes how the 3 options were developed to take forward for further and more detailed consideration.
 - Section 7: Shortlisted options – describes the 3 shortlisted options in more detail
 - Section 8: Traffic analysis – summarises the sources of data obtained, the modelling undertaken and the accompanying forecasting and analysis.
 - Section 9: Road layout and standards – identifies the standards used for the design of the scheme, design speeds of the road elements, cross section and headroom and probable junction locations.
 - Section 10: Economic assessment – describing the application of the assessment tools, the assumptions made during the economic assessment and the cost benefits for the 3 options
 - Section 11: Safety assessment – describing Highways England’s policy, the results from the desktop road safety review of the 3 options, a review of the buildability of the scheme and the traffic management and road diversions required during construction.
 - Section 12: Environmental assessment – discusses the effect of each option on the following topics; noise, air quality, greenhouse gases, landscape, historic environment, biodiversity and water environment.
 - Section 13: Social impact appraisal – discusses the social effects of the scheme.
 - Section 14: Engagement with stakeholders – identifies the stakeholders, workshops undertaken, community engagement meetings and Statement of Community Consultation development group meetings
 - Section 15: Appraisal summary – summarises the pros and cons of the 3 options after taking account of the sections described above, and presents the Appraisal Summary Tables

- Section 16: Programme – describes the timescales for the development and delivery of the scheme
- Section 17: Conclusions and recommendations – provides a brief overview of the report, and recommends the options to be taken forward to public consultation, with a commentary on how they meet the scheme objectives
- Appendix A Glossary – lists the acronyms used throughout the report
- Appendix B Route options and environmental constraints plan – shows the longer list of options considered, the 3 options considered in more detail and the Environmental Constraints Plan
- Appendix C: Sift scoring mechanism
- Appendix D: The Appraisal Summary Tables referred to in Section 15

2. Planning Brief

2.1. Scheme objectives

- 2.1.1. Highways England's objectives for the A358 Taunton to Southfields Roundabout dualling scheme, expressed as Client Scheme Requirements, are outlined below.

2.2. Client scheme requirements

- 2.2.1. The scheme will be developed as a high-quality dual 2-lane all-purpose road (D2AP) making an essential contribution to improving connectivity between the south east and south west.

- 2.2.2. The Client Scheme Requirements are:

- Support economic growth
 - Facilitate growth in employment at key locations and centres along the A303 / A358 / A30 corridor and to the south-west region
 - Facilitate growth in housing at key development hotspots along the corridor
- Capacity
 - Reduce delays and queues that occur during peak hours and at seasonal times of the year
- Resilience
 - Improve the resilience of the A303 / A358 / A30 route corridor
- Safety
 - Improve safety along the A303 / A358 / A30 route corridor
 - Improve safety along the A358 Taunton to Southfields Roundabout route for non-motorised users (NMUs)
- Connectivity
 - Improve the connectivity of the south west to the rest of the UK, to reduce peripherality and improve business and growth prospects
- Environmental
 - Avoid unacceptable impacts on the surrounding natural and historic environment and landscape and optimise the environmental opportunities and mitigations that the intervention could bring
- Reduce severance on local communities
- Promote opportunities to improve the quality of life for local communities

2.2.3. Throughout the design and delivery stages, the scheme should ensure that customers and communities are fully considered. Specifically, this should include:

- Understanding the needs of all of customers (including vulnerable users), stakeholders and partners.
- Responding to those needs such that the end-product delivers an improved customer experience.
- Assessing the impact of works on roads users and communities, minimising disruption and delivering appropriate mitigation measures. This assessment should also look at issues through customers' eyes.

2.3. Highways England organisational objectives

- During construction, the effect on Highways England's customer impact Key Performance Indicator (KPI) should be taken into account and close dialogue held with the Regional Intelligence Unit (RIU), Operations Directorate (OD) and Somerset County Council to consider traffic delay.
- During design, close working with OD to consider future maintenance requirements to ensure the scheme is maintainable in a safe manner.
- Current known maintenance requirements are picked up in construction of the scheme and that, following completion, there is a minimum 5-year maintenance free period to protect customer experience.
- All asset data to be handed over within a reasonable timescale following agreed handover to maintenance.

3. Existing conditions

3.1. Introduction

- 3.1.1. This section describes existing conditions within the scheme study area along the existing A358 corridor between Taunton and Southfields Roundabout, near Ilminster. All references in this section to scheme options relate to the proposed options described in Section 5 of this report.

3.2. Description of the locality

Introduction

- 3.2.1. The existing A358 is located within the county of Somerset in the south west of England. The road runs in a north-west / south-east direction between the towns of Taunton and Ilminster. At Taunton, the A358 connects to the M5 motorway at junction 25 and connects to the A303 at Ilminster at the Southfields Roundabout.
- 3.2.2. The A358 passes through the civil parishes of Ruishton, Thornfalcon, West Hatch, Hatch Beauchamp, Bickenhall, Ashill and Horton. As the route travels from west to east between Hatch Beauchamp and Ashill it also crosses the boundary of the districts of Taunton Deane and South Somerset.
- 3.2.3. The scheme area lies to the north of the Blackdown Hills Area of Outstanding Natural Beauty (AONB) and to the south of the Somerset Levels. To the west the scheme area is bounded by the M5 motorway and to the east by the A303. The location provides significant challenges from an engineering perspective due to both the undulating nature of the terrain in certain sections and the number of watercourses crossing the scheme from south to north as they run down from the Blackdown Hills towards the Somerset Levels. Environment Agency mapping indicates that many of these watercourses exceed bank-full conditions during times of high flow, leading to flooding of the surrounding land.
- 3.2.4. From an environmental perspective, the scheme area presents further challenges due to its proximity to the Blackdown Hills AONB as well as containing pockets of ancient woodland and Sites of Special Scientific Interest (SSSI). The area also contains an Air Quality Management Area (AQMA) and Noise Important Areas (NIAs). The environmental aspects are discussed further in Section 3.12.
- 3.2.5. The scheme area passes through 5 identified landscape character regions within the districts of Taunton Deane and South Somerset. Further details are given in Sections 3.6 and 3.12.

Demographics

- 3.2.6. Approximately half the scheme lies within the district of Taunton Deane and half lies within South Somerset District. South Somerset is the largest district in Somerset covering an area of 370 square miles (959 square kilometres). It is generally rural, with significant levels of arable and livestock farming.
- 3.2.7. The 2011 census gives the population of South Somerset District as 162,113 which gives a resultant population density of 437 people per square mile (169 people per square kilometre). Taunton Deane has a smaller area of 178 square miles (462 square kilometres) and a smaller population of 110,187 as given in the 2011 census. The resultant population density however, is higher than South Somerset at 622 people per square mile (240 people per square kilometre). This reflects the more built-up character of Taunton Deane which includes the county town of Taunton and adjacent villages.
- 3.2.8. The town of Taunton is the administrative centre of Taunton Deane Borough Council. Somerset County Council is also based in the town, at County Hall.
- 3.2.9. The largest age group across the districts were people aged 45-64. This age group accounted for approximately 28% of all residents in each district. Most notable perhaps is that over 1 in 5 people in each district are ages 65+ (21.6% in South Somerset and 20% in Taunton Deane). This is higher than the national average of 16.4%.
- 3.2.10. The area in general has low levels of unemployment, compared to the national average, amongst the working age population. However, average gross weekly incomes are below the national average.

Landmarks

- 3.2.11. Barrington Court, a Tudor manor house and National Trust site, lies 2.8 miles (4.6 kilometres) east of the village of Ilton, which itself is 1.5 miles (2.4 kilometres) east of A358.
- 3.2.12. Hatch Court, a Grade I listed mansion with extensive grounds, is located in the village of Hatch Beauchamp approximately 0.6 miles (1 kilometre) to the north-east of the existing A358. The mansion also contains a military museum.

Transport links

- 3.2.13. The area has benefited from the establishment of extensive transport links which have contributed to its historical and current role in economy and commerce. The Bridgwater and Taunton Canal and Grand Western Canal were constructed through Taunton in the early to mid-19th century, and the London to Penzance rail line reached Taunton in the mid-19th century. The construction of the M5 motorway in the 1970s provided a continuous motorway connection between Taunton and cities such as Exeter, Birmingham and beyond connecting to London via the M4. The route corridor of the A303 / A358 has formed a major link from London to the south west for centuries and is the most direct strategic route between the south east and south west.

Taunton

History

- 3.2.14. Taunton is situated on River Tone and local records suggest that the town has origins as far back as the Bronze Age. Of particular note are recent finds at Cambria Farm (now a Park-and-Ride site adjacent to junction 25 of the M5) where Bronze Age, Roman and Iron Age artefacts were found.
- 3.2.15. The town has a wealth of religious and military history, including a monastery, dating back to the 10th century, and Taunton Castle, which has origins in the Anglo-Saxon period. There are several notable places of worship, including the Parish Church of St Mary Magdalene (with its original 15th/16th century tower) and the Parish Church of St James which dates back to the 14th century.
- 3.2.16. There has been a permanent military presence in the town since the 19th century, and it is currently home to 40 Commando Royal Marines, based at the Norton Manor Camp to the north-west of the town.

Economy and regeneration

- 3.2.17. Taunton was named as a 'Strategically Important Town or City' in the government's Regional Spatial Strategy, allowing Somerset County Council to receive funding for large-scale regeneration projects. In 2006, the council revealed plans which it called "Project Taunton" to regenerate the areas of Firepool, Tangier, the retail town centre, the Cultural Quarter and the River Tone with the aim of sustaining Taunton as a central hub for business in the south west. It was noted in the strategy that the government sees Taunton's traffic congestion problems as a serious obstacle to its continuing economic growth.

-
- 3.2.18. As part of the regeneration plans for Taunton, a strategic employment site has been identified in the vicinity of junction 25 of the M5 which has the potential to be a significant influence on the western end of the scheme. This development, known as “Nexus 25”, is due to commence construction in 2020 and is intended to attract inward investment and new employers to Taunton and is expected to create up to 4,000 jobs once fully occupied.
- 3.2.19. Prominent local employers in the town include The United Kingdom Hydrographic Office, Somerset County Council and Taunton Deane Borough Council.

Culture

- 3.2.20. Taunton lacks a public building such as an assembly room or municipal hall that might be expected for a town of its size. However, there is a cinema at the Hankridge Farm Retail Park and a small theatre and arts centre near the town centre.

Sport and recreation

- 3.2.21. Taunton is one of the largest shopping centres in the area, with a large selection of high street shops in the town centre and a number of retail parks, the largest of which is situated at Hankridge Farm, adjacent to junction 25 of the M5.
- 3.2.22. The town is home to Somerset County Cricket Club and Taunton Racecourse, both of which host national sporting events. The cricket ground is currently undergoing phased redevelopment that enabled international cricket to be played there from 2017 onwards. There are also football, rugby league, rugby union, basketball and volleyball teams based in the town.
- 3.2.23. There are large numbers of recreational routes in and around the area. These include Sustrans Route 33 which passes through Hatch Beauchamp, and an associated local cycle route which connects Sustrans Route 33 to Taunton and the Blackdown Hills. The East Deane Way runs generally in a north-south direction through the scheme area and there is a circular route known locally as the Neroche Herepath which is suitable for walking, horse-riding and mountain-biking.

Iminster

3.2.24. Iminster is located at the eastern end of the scheme in the district of South Somerset, close to the River Isle and the A303. The town has a population of approximately 5,800 people and can be found in documents dating back to the year 725AD. Notable buildings in Iminster include a 16th century grammar school, which acts as the town's art gallery and concert hall, and the Church of St Mary which dates back to the 15th century. There is a small selection of shopping available in the town centre and a Tesco superstore just outside the centre.

Other local villages

3.2.25. Ruishton, Thornfalcon, West Hatch, Hatch Beauchamp, Bickenhall, Ashill and Horton are all villages of varying size which lie along the existing A358. The largest of these is Ruishton, with a population of 1,473, whilst the smallest is Thornfalcon, with a population of just 119. All the villages listed lie in the district of Taunton Deane with the exception of Ashill and Horton which are located in the district of South Somerset. Several of the villages have some historical importance dating back to as far as the Roman era.

3.2.26. Many of these villages have benefited from historical upgrades of the A303 and A358 which have resulted in significant levels of traffic being removed from the village centres. However, Ruishton and Henlade are notable exceptions to this. Traffic levels, and the associated congestion, noise and air quality impacts are contentious issues in these 2 villages. In Henlade, there is an Air Quality Management Area (AQMA), located on the existing A358, that has been declared for exceedances in the national NO₂ annual mean objective. There is also a Noise Important Area (NIA) along the existing A358 at Henlade.

3.3. Existing highway network

Existing highway concerns

3.3.1. The A303 / A358 / A30 corridor has been extensively studied previously given its importance in providing the second strategic link to the south west (the first being the M4 and M5 corridor)¹. The A358 corridor has also previously been examined by Somerset County Council and the Highways Agency (predecessor to Highways England) as an alternative to improvements across the Blackdown Hills.

¹ Department for Transport (2015). A303, A358 and A30 corridor feasibility study: reports. Available at: <https://www.gov.uk/government/publications/a303-a358-and-a30-corridor-feasibility-study-technical-report>.

- 3.3.2. Along the A303 and A358, there are a number of common issues that result in the poor level of operation often experienced by motorists, businesses and residents. These can be broadly summarised as:
- Mixed road typology – the corridor is comprised of a mix of dual 2-lane, single 3-lane and single 2-lane carriageway which leads to localised congestion where the standard drops, impacting on journey times and journey time reliability.
 - Accidents – several sections of the corridor suffer from accidents as a result of alignment not in accordance with current standards, poor junction visibility and changes in road provision.
 - Environment and Historical Environment – the route passes through a number of sensitive environmental and historic environmental areas which result in challenges in improving the network on these sections.
 - High traffic flows – many sections of the route experience traffic demand above that for which they were designed. This is exacerbated in summer when there is typically 30% additional traffic.
- 3.3.3. In addition to these existing issues, the corridor is subject to the pressures brought about through traffic growth, something which is forecast to increase as local authorities along the length of the route seeking to deliver their development plans for more jobs and housing, especially as the economic outlook improves.

The A303 / A30 corridor

- 3.3.4. The A303 / A30 forms part of the strategic road network and is a strategic link between the south west peninsula and the rest of the south, south east and London (see Figure 1.1 above). The route comprises multiple all-purpose road standards including dual 2-lane carriageway (D2), single 2-lane carriageway (S2) and single carriageway sections with overtaking lanes (S2+1), together with associated varying speed limits (from 40mph to 70mph).
- 3.3.5. Approximately 37% of the existing A303 / A30 corridor is single carriageway (S2) with corresponding reduced capacity, creating multiple bottlenecks resulting in significant congestion, particularly during peak summer periods and at weekends. The corridor is recognised as one of the long-standing road congestion hotspots in the country.
- 3.3.6. During the summer months and on weekends, over an hour can be added to a typical journey from London to the south west. The corridor operates under stressed conditions, more so in summer when flows increase by up to 37% with consequential poor journey time reliability. This congestion also impacts the local communities who suffer the disruption, noise and air quality impacts from queueing traffic and rat-running.

Existing A358 between Taunton and Southfields Roundabout

- 3.3.7. The existing section of the A358 between Taunton and Ilminster is approximately 8.7 miles (14 kilometres) long (see Figure 1.3). The route predominantly comprises single carriageway, with a short section of dual carriageway (approximately 0.8 miles (1.3 kilometres)) between Henlade and Mattock's Tree Green. This is preceded for 500 metres to the east by a section of single carriageway with an overtaking lane as the road rises up to the crest at Mattock's Tree Green. There is also a short section of dual carriageway on the approach to the M5 junction 25.
- 3.3.8. At the western limit of the scheme, the A358 forms 1 of 5 arms of the M5 junction 25 roundabout, which is a partially-signalised 3-lane roundabout under the M5 motorway. This junction allows access from the A358 to the M5 and into Taunton. At the eastern end of the scheme, the A358 forms 1 of 5 arms of the Southfields Roundabout which is situated on the A303 at the western end of the Ilminster Bypass. This junction provides access into Ilminster, Horton Cross or to the A303. Along the A358 between Taunton and Southfields Roundabout there are numerous at-grade local road junctions, the most notable of which is the traffic signal controlled junction with the A378 at Mattock's Tree Green. Other local roads provide access to local villages such as Ilton, Ashill, Hatch Beauchamp, Bickenhall, Thornfalcon, Ruishton and Henlade.
- 3.3.9. There is 1 grade-separated crossing of the A358. This carries the A358 Hatch Beauchamp Bypass over Griffin Lane on a significant structure which has recently been strengthened following the identification of potential weaknesses.
- 3.3.10. There are 12 known watercourse crossings along the route. A number of these are considered minor and hence accommodated by piped culverts. However Back Stream, Cad Brook, Venner's Water, Fivehead River and Broughton Brook are more significant and are accommodated by larger structures, such as underpasses.
- 3.3.11. The existing A358 has been the subject of a number of upgrades. The short dualled section at Mattock's Tree Green appears to have been upgraded in the 1960s or 1970s, possibly in response to the poor vertical alignment and associated visibility through this section which is likely to have made overtaking and turning manoeuvres at the A378 junction particularly dangerous on the single carriageway. The single carriageway section around Hatch Beauchamp was constructed as a bypass in the 1980s, the original route of the A358 having passed through the centre of the village. Similarly, the section of single carriageway around the village of Ashill was constructed as a bypass in the 1990s.

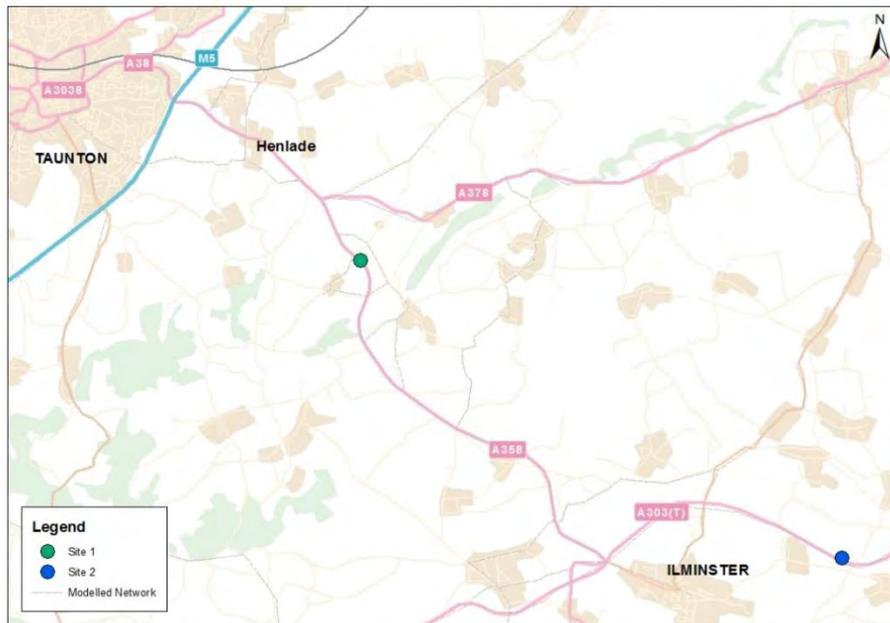
- 3.3.12. The corridor suffers from congestion where the two-lane sections merge into one lane creating bottlenecks, especially for the westbound direction towards Taunton in the AM peak. There are also capacity issues at M5 junction 25 in the AM, mainly on the A358 westbound approach.

3.4. Traffic data

A358 Traffic data

- 3.4.1. Automated Traffic Count (ATC) data for the A358 has been collected and analysed to capture the traffic situation in the study area. An ATC was installed for 2 weeks in October 2015 on the A358 between the junction with the A303 at Southfields Roundabout and the junction with the A378, at Site 1 shown in Figure 3.1. Table 3.1 shows the average daily traffic flow (2-way) on the A358 for an average Monday to Thursday, Friday, Saturday, and Sunday in the neutral month of October. The table shows lower daily flows at weekends but higher flows on a Friday compared with an average Monday to Thursday.

Figure 3.1: ATC – Locations



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Table 3.1: A358 ATC Automatic Traffic Counts October 2015

Location: Site 1 (A358 between A378 and Southfields Roundabout)	October 24 hour 2-way daily flow
Mon–Thurs Avg 2015	23,800
Friday Avg 2015	26,600
Saturday Avg 2015	19,600
Sunday Avg 2015	19,100

Note: All daily flows have been rounded to the nearest 100.

3.4.2. In Figure 3.2 and Figure 3.3 below we can see, respectively, the hourly 2-way traffic flow profile on an average working day in October and a comparison of the flow profiles on different days in a week. In Figure 3.2 it can be seen that the A358 follows a typical highway peak pattern in a working week, with higher flows in the AM and PM peaks due to regular working week commuter traffic. Figure 3.3 shows that during an October Friday high traffic flows occur from 11am to 6pm. It is noted that traffic flows are highest in the morning peak period on all other weekdays excepting Fridays.

Figure 3.2: A358 ATC – Average Working Weekday Averages October 2015 (2- Way Traffic Flows)

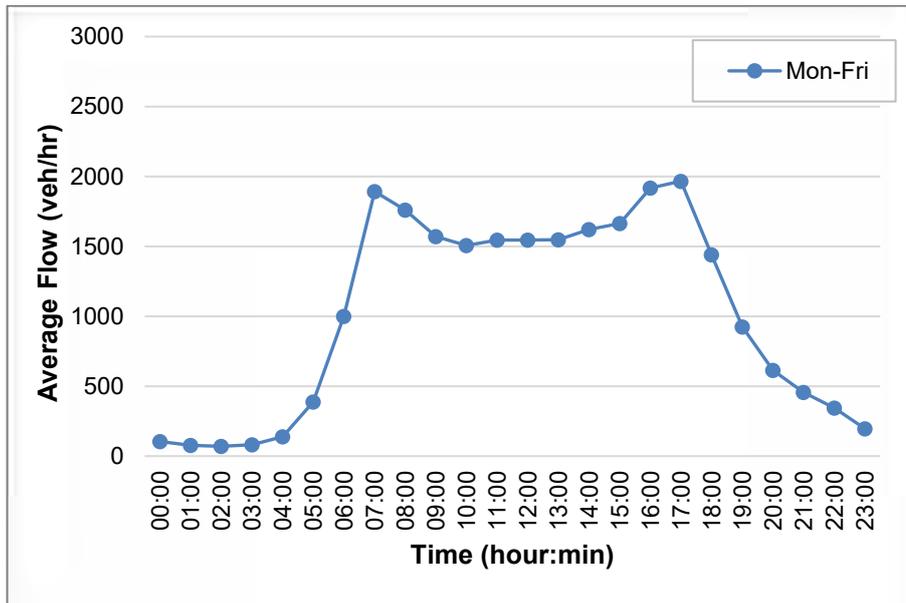
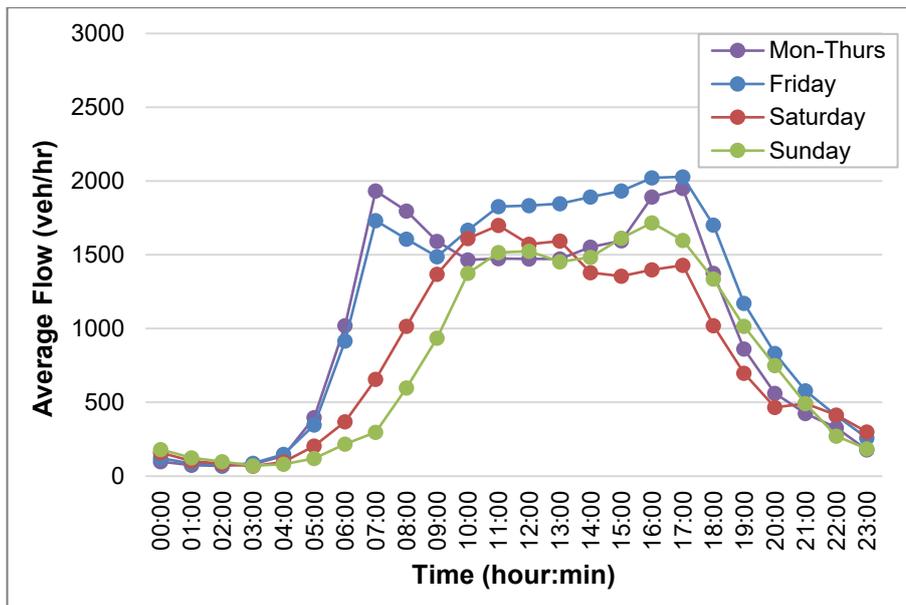


Figure 3.3: A358 ATC – Average Working Weekday Averages October 2015 (2- Way Traffic Flows)



A303 Traffic Data

3.4.3. Along the A303 there are a number of Highways England Open Data Automatic Traffic Count (ATC) sites. As the new scheme is proposed to connect with A303 at Southfields Roundabout, an analysis of a Highways England ATC site on the A303 close to A358 has been undertaken represented by Site 2 in Figure 3.1 to show the characteristics of A303 traffic. That data has been obtained for both August and October 2015 to assess the traffic levels and to analyse the daily flow profiles in both a neutral and peak month as during summer months the traffic flows have been observed to increase significantly. The average daily flows for August and October on the A303 are shown in Table 3.2 below for different days of the week. This shows that daily flows on a Friday in October are substantially higher than Monday–Thursday flows and that weekend flow levels are not much lower than Monday to Thursday flows. Flows on all days of the week in August are higher due to holiday traffic. All daily flows have been rounded to the nearest 100.

Table 3.2: A303 2015 Automatic Traffic Counts

Location: Site 2 (A303 east of Ilminster)	August 24 hour 2-way daily flow	October 24 hour 2-way daily flow
Mon–Thurs Avg 2015	30,400	26,900
Friday Avg 2015	39,400	35,600
Saturday Avg 2015	34,700	24,300
Sunday Avg 2015	26,600	23,100

3.4.4. Figure 3.4 below shows the average weekday flow profile against the profiles for August and October. This confirms that October follows a close resemblance to the annual average flow profile, and that the August profile is considerably higher. It should also be noted that the profiles do not display the usual morning and evening peaks and that the interpeak traffic flow is higher than the AM 'peak' traffic. Figure 3.5 gives a comparison of average daily flow profiles over a weekend (Saturday and Sunday) between August and October. This shows universally higher flows on the A303 during August in all time periods.

Figure 3.4: A303 - Average Annual Weekday 24 Hour Flow against August and October 2015 (2- Way Traffic Flows)

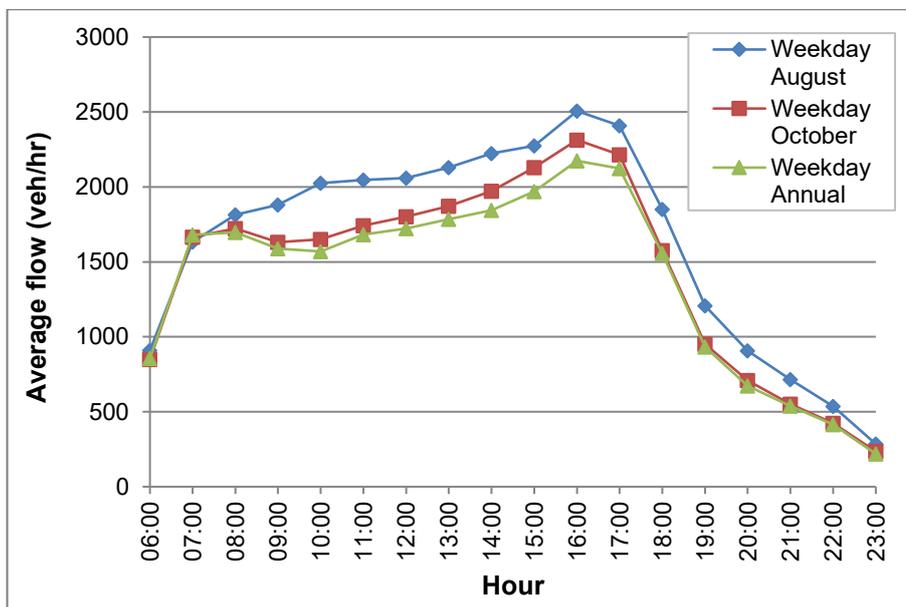
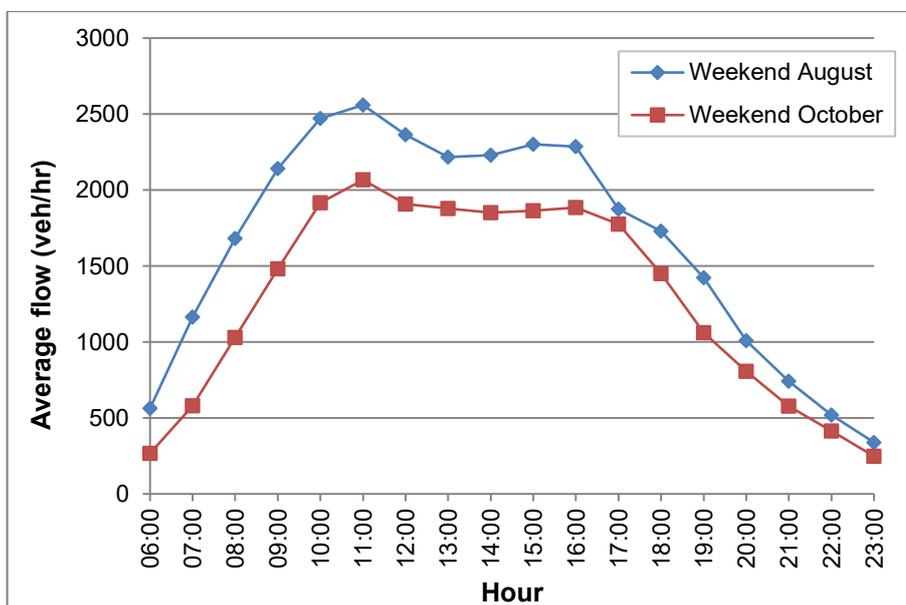


Figure 3.5: A303 - Average Annual Weekend 24 Hour Flow against August and October 2015 (2-Way Traffic Flows)



3.4.5. Average hourly flow profiles for different days of the week in August and October 2015 are shown in Figure 3.6 and Figure 3.7. These graphs demonstrate that there is a significant increase in Friday flow levels, as compared to the rest of the working week in both months, particularly in the PM peak. Peak flows at weekends are considerably higher in August reaching almost 3,000 vehicles per hour in the Saturday AM peak in August. None of the traffic flow profiles demonstrate typical commuting peak profiles.

Figure 3.6: A303 - Annual Average 2-way Flow Week Profile October 2015

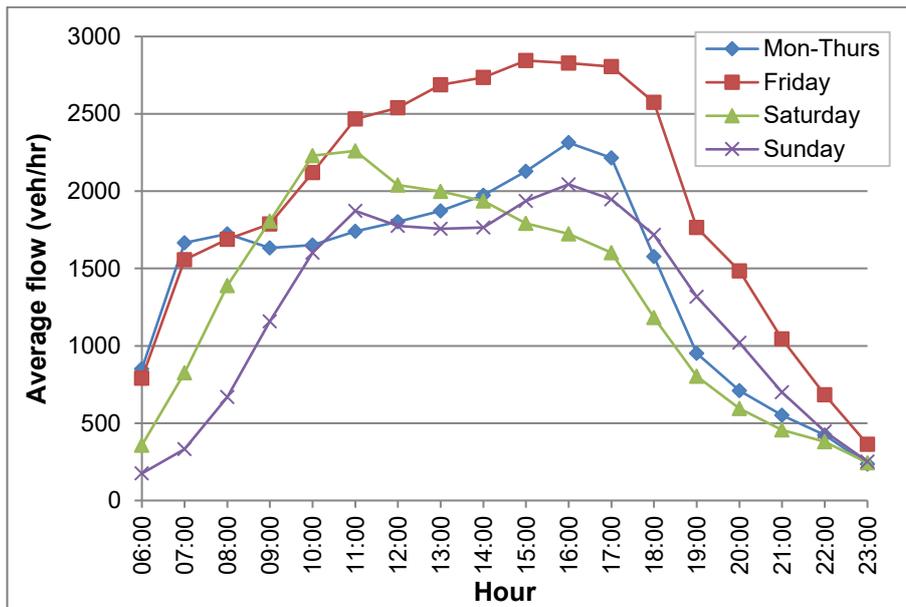
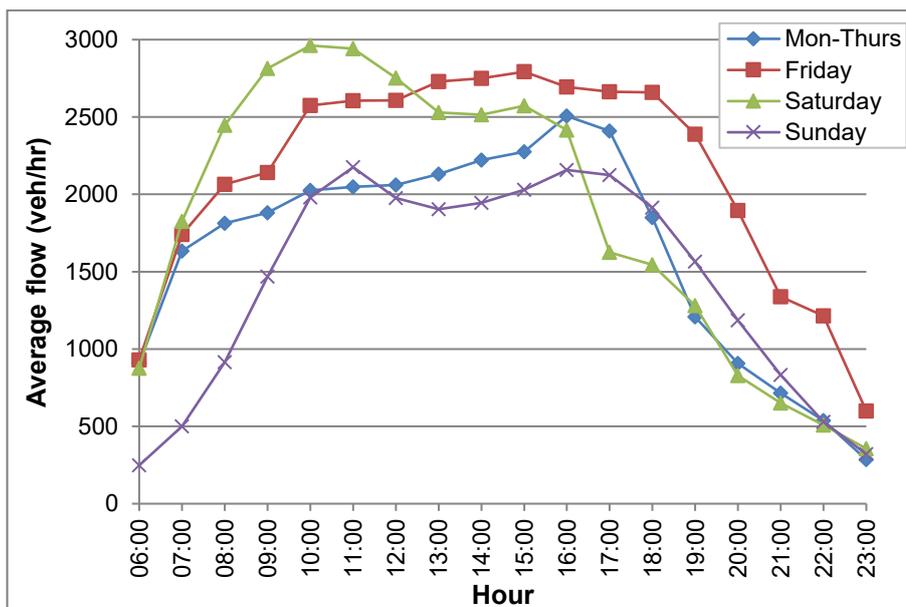


Figure 3.7: A303 - Annual Average 2-way Flow Week Profile August 2015



3.5. Accidents and journey time reliability

Accidents

- 3.5.1. Personal Injury Accident (PIA) data was obtained from Highways England, Devon County Council and Somerset County Council for the study area for the latest full five-year period preceding the 2015 base year traffic model (January 2010 to December 2014). This is required by the COBALT (COst and Benefit to Accidents – Light Touch) software, developed by the DfT to undertake the analysis of the impact on accidents as part of economic appraisal for a road scheme.
- 3.5.2. Total accident numbers by location have been calculated by severity (fatal, serious and slight) for the A303 / A358 / A30 and M5 in the simulated model area as well as the two A358 junctions with the A303 (Southfields Roundabout) and M5 (junction 25 at Taunton). A summary of the accidents by severity is presented in Table 3.3. Accidents at junctions are those that occurred within 20 metres of the junction.

Table 3.3: Accidents by severity (1 January 2010 to 31 December 2014)

Location	Fatal	Serious	Slight	Total
A358 - between M5 junction 25 and the A303	1	20	42	63
M5 junction 25	0	0	18	18
Southfields Roundabout (A358 / A303 junction)	0	4	16	20
A303 – Southfields Roundabout to A303 / A30 junction	1	10	40	51
A30 – A303 / A30 junction to M5 junction 29	4	19	86	109
M5 – junction 25 to junction 29	7	15	115	137
TOTAL	13	68	317	398

- 3.5.3. On the A358, between the Southfields Roundabout at Ilminster and the M5 at junction 25, a total of 63 accidents occurred in the 5-year period analysed, of which 1 was fatal, 20 were serious and 42 were slight. The 1 fatality involved a motorcycle travelling eastbound colliding with another eastbound vehicle, throwing the rider from the motorcycle. The accidents were distributed fairly evenly along the corridor, with the exception of the following small clusters:
- 6 accidents occurred between Cad Road and Broadway Road, approximately 0.6 miles (1 kilometre) north of the Southfields Roundabout. The accidents all resulted in slight injury. 5 of the accidents involved vehicles turning in or out of the local roads. The sixth accident involved a shunt.
 - 5 accidents occurred in the vicinity of the Park Barn Lane crossroads junction. These consisted of 4 slight and 1 severe accident. 3 of the accidents involved shunts and 2 were head-on collisions.

- 7 accidents occurred in Henlade between the Stoke Road/Lipe Lane crossroads and the commencement of the dual carriageway section. 2 resulted in serious injury and the remainder resulted in slight injury. 3 accidents involved a shunt; 3 involved a vehicle turning out of a local road or drive and 1 accident involved overtaking.
 - 4 accidents occurred in the vicinity of the Bushy Cross Lane junction, west of Henlade. 3 resulted in slight injury and 1 in serious injury. 2 of these accidents involved traffic turning off the main road, 1 involved a head-on collision, and 1 involved a shunt.
- 3.5.4. At the M5 junction 25 a total of 18 accidents occurred in the time period analysed. All resulted in slight injury. The majority of accidents involved a shunt but 1 accident at this location involved a side-swipe.
- 3.5.5. At the Southfields Roundabout, a total of 20 accidents occurred in the time period analysed, 16 of which were slight and 4 of which were serious. The collisions appear to have been the result of a mixture of manoeuvres and vehicle types with contact made between various parts of the vehicles in question.
- 3.5.6. The accident rate for the existing A358 is comparable to the national average for all rural A class trunk roads. See Table 3.4 for details.

Table 3.4: Accidents rates

Location	Accident rate per billion vehicle kilometre travelled		
	A358 between A303 and M5	National Accident Rate	
		All Rural Trunk A roads 2.*	All Rural A roads 1.
A358 between A303 and M5	110	113	171

Notes:

1. National average for '2013 Rural A roads' taken from Department for Transport statistics: RRCGB 2013, Table RAS10002
2. Calculated from:
Strategic Road Network Traffic Report TRA41 - Table TRA4112
Reported Road Casualties on the Strategic Network 2013 Report PR67/4 Table B.1

Journey time reliability

- 3.5.7. An assessment of the impact of options on journey times is made by selecting typical journey routes through the study area (known as journey time routes), and then estimating the journey times on them without the scheme and with the scheme in place to determine the overall impact. Three main journey-time routes were selected along the A358, A303 / A30 and M5, as shown on Figure 3.8 below. These routes were chosen for representing journey-times on the 3 main corridors included within the traffic model that are bounded by M5 junction 25, M5 junction 29 and Southfields Roundabout at Ilminster.

- 3.5.8. Journey time data was extracted from Trafficmaster² for an average October 2015 weekday average (Monday to Thursday) for the 3 main journey-time routes. This has served to validate the travel times set in the base year traffic model. The Trafficmaster data was extracted for the Ordnance Survey Integrated Transport Layer covering the Fully Modelled Area of the A358 model layer and has been refined to accurately match the local model network topology.
- 3.5.9. A summary of average observed journey times and speeds during the October 2015 weekday model time periods is provided in Table 3.5 for 3 main routes. The average speeds across the three time periods and two directions are 53 km/h (33mph), 82km/h (51mph) and 117km/h (73mph) for the three routes: A358, A303 / A30 and M5. This shows for a neutral traffic period that the M5 route meets Highways England's aspiration of a strategic road network (SRN) operating at a mile a minute, that is at 60 mph. However, the A303 / A30 route speed is lower (51 mph) and the A358 route is much lower (33 mph). It should be noted that route average speeds during the summer peak periods will be significantly lower still.

Table 3.5: Observed journey times and speeds for the A358 model

Route Number	Road	Direction	Distance (km)	AM Peak Journey time [min] Speed [km/h] Speed [mph]	Inter Peak Journey time [min] Speed [km/h] Speed [mph]	PM Peak Journey time [min] Speed [km/h] Speed [mph]
1	A358 - J25 to Southfields Roundabout	EB	14.1	16.89 50 31	14.64 58 36	14.96 57 35
1	A358 - Southfields Roundabout to J25	WB	14.1	22.6 37 23	15.11 56 35	14.37 59 37
2	A303/A30 - J29 to North of Ilminster	EB	48.7	35.14 83 52	35.74 82 51	34.07 86 53
2	A303/A30 - North of Ilminster to J29	WB	48.7	37.73 77 48	36.5 80 50	35.66 82 51
3	M5 - J29 to J25	EB	47.4	24.38 117 73	24.1 118 73	23.4 122 76
3	M5 - J25 to J29	WB	46.7	24.15 116 72	24.26 115 72	23.66 118 74

² Trafficmaster data is GPS-based data available from the Department for Transport

Figure 3.8: A358 Model – Journey Time Routes - Annual Average 2-way Flow Week Profile October 2015



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- 3.5.10. The stress-based approach, set out in TAG A1.3 Appendix C.5 can be used as an approximation of journey time reliability, with change in stress (either between base year and Do-Minimum for the scheme opening year, or between Do-Minimum and Do-Something again for the scheme opening year) essentially a proxy for change in reliability. The procedure takes into account the geometric parameters of the road, the Congestion Reference Flow (CRF, which is the level of Annual Average Daily Traffic at which congestion will occur during peak periods) and compares it with the existing or forecast AADT through the road link considered to work out a “stress” value of the road link (in the base, Do-Minimum and Do-Something scenarios).
- 3.5.11. In October 2015, the A358 has stress levels of 91% in the eastbound direction and 75% in the westbound direction. A stress level of 91% is sufficient to cause delays and congestion and, in accordance with the guidance, has been taken at a neutral month – in this case October. If a summer month is used instead, the stress levels for the A358 will be closer to 100% or higher, almost certainly indicating congestion and delays.

3.6. Topography, land use, property and industry

Topography

- 3.6.1. The existing A358 is generally located in a low-lying area and crosses a number of watercourses. Its highest point is approximately 59 metres above ordnance datum (AOD) as it passes to the south-east of Hatch Beauchamp, and its lowest point is approximately 12 metres AOD as it crosses the Broughton Brook flood plain, just to the east of the M5 motorway.
- 3.6.2. Many of the watercourses that are crossed by the A358 have associated flood plains and are tributaries of watercourses associated with the Somerset Levels. In particular, the River Tone flood plain lies approximately 500 metres to the north of the A358 at Ruishton, the West Sedgemoor wet meadow lies 2.5 miles (4 kilometres) to the north-east at Wrantage, and the River Isle flood plain lies approximately 0.6 miles (1 kilometre) east of the Southfields Roundabout. The A358 crosses flood plains of tributaries of each of these watercourses.
- 3.6.3. In contrast, the Blackdown Hills lie approximately 2.5 miles (4 kilometres) to the south-west of the existing A358. Staple Hill, which is situated at its northern edge, is the highest point of the Blackdown Hills at a height of 315 metres AOD. Tributaries of the Rivers Tone, Isle and West Sedgemoor, radiate outwards from the Blackdown Hills, separated by two prominent ridges. The western ridge includes the feature known as Mattock's Tree Hill which the A358 passes over. A smaller ridge known as Stoke Hill protrudes from this ridge just south of Mattock's Tree Hill, for approximately 1.2 miles (2 kilometres) westwards towards Taunton. The eastern ridge includes the Wrantage Escarpment, a wooded slope that is referred to in the Taunton Deane Landscape Character Assessment. Most of the notable features of this escarpment lie to the north of the existing route, although the ridge line accounts for the highest point of the existing carriageway.

Land use, property and industry

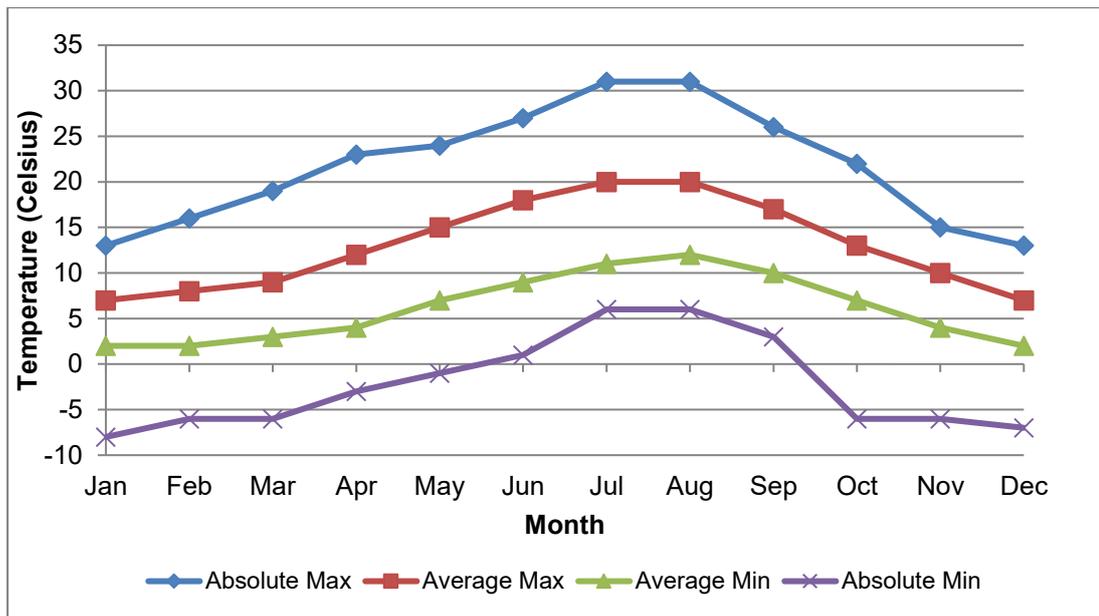
- 3.6.4. Land use within the eastern suburbs of Taunton includes post-war residential, employment and retail developments, all of which occupy land to a relatively high density right up to the M5 motorway boundary. The villages of Ruishton and Henlade are situated just to the east of Taunton.
- 3.6.5. The built-up boundary of Ilminster is slightly remote from the scheme limits, being separated from the A303 and A358 by the River Isle and associated flood plain. Land use within the town includes a mixture of retail, industry and residential, although much of the property is older than in the eastern suburbs of Taunton.

- 3.6.6. Between Taunton and Ilminster most of the land within the scheme area is rural, much of it in agricultural use. The agricultural land use is a mixture of arable and livestock farming and is mostly of grade 3 ('good to moderate') quality, according to the Agricultural Land Classification Map, south west region (Natural England, August 2010). Villages, hamlets, farmsteads and individual dwellings occupy land within this agricultural area, including Henlade, Hatch Beauchamp and Ashill. The A358 passes directly through Henlade leading to properties having direct access / egress from both sides of the carriageway. Space for modification and particularly widening of the existing A358 through Henlade would be limited, without significantly impacting upon residential buildings.
- 3.6.7. There is currently very little industrial land use within close vicinity to the scheme area. However, an employment site is proposed near junction 25 of the M5 as part of Taunton's regeneration. This development, known as "Nexus 25", is due to commence construction in 2020, and will take up approximately 25 hectares. Adjacent to this there is a recently constructed Park-and-Ride which provides access to and from Taunton.

3.7. Climate

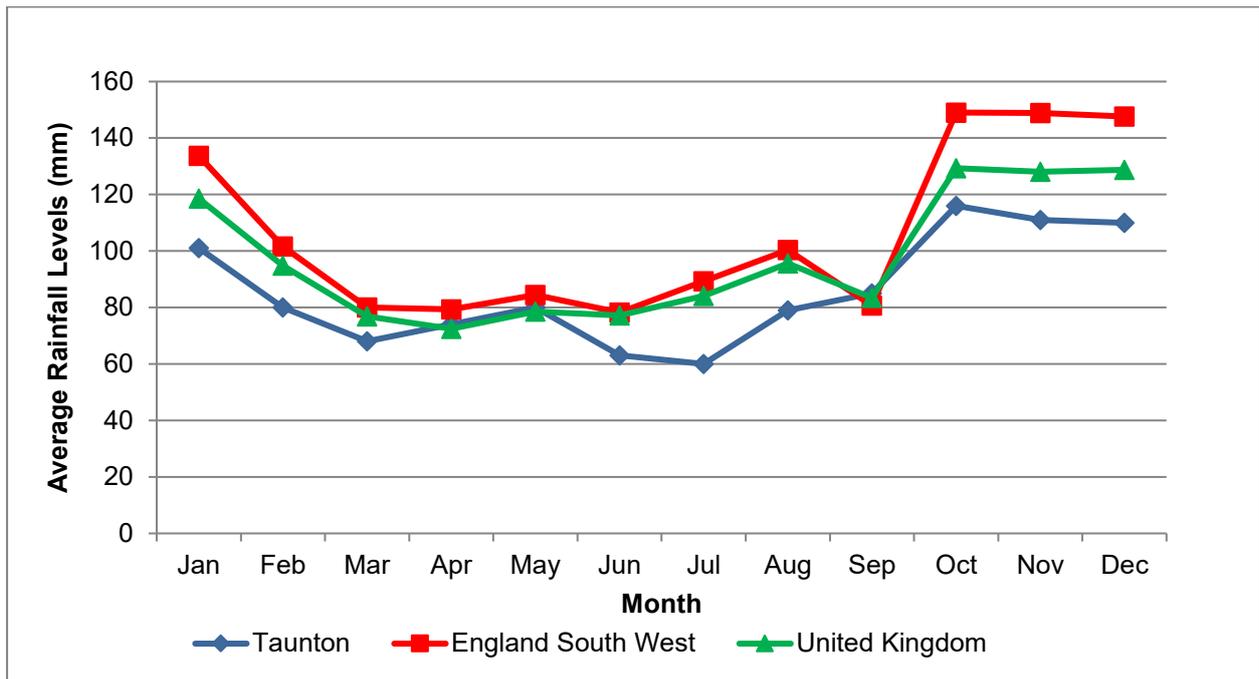
- 3.7.1. The south west region of England experiences an oceanic climate, which is typified by being mild with no dry season. Figure 3.9 illustrates the temperature variations. The adjacent sea temperature leads to a less extreme seasonal variation than most parts of United Kingdom. Average annual 24-hour temperature is lower than 10°C (50.0°F), with the summer months of July and August being the warmest (mean daily maximum of 21°C (69.8°F). Peak maximum temperatures exceed 30°C (86°F) during the summer months. During winter, a mean minimum temperature of 1°C (33°F) is common, with peak minimum temperature of -8°C (17°F).

Figure 3.9: Temperature: averages and extremes for the south-west of England



Source: <http://www.myweather2.com> (Consulted in March 2016)

- 3.7.2. Figure 3.10 compares consolidated data of 2 decades of monthly average rainfall levels between Taunton, the south-west of England and UK-wide. This analysis was made based on public information available from the websites www.metoffice.gov.uk (UK and South-West England) and www.myweather2.com (Taunton). The south-west has rainfall close to the wider UK average for most of the year, with slightly less than average monthly rainfall (20mm) during October, November and December. Due to Taunton's comparatively low-lying position, in the lee of higher ground to the west, north and south, less rain falls at Taunton than either the UK average or across the wider south west peninsular. The difference in rainfall at Taunton compared to the UK average is again most notable in October, November and December, when there is on average 36mm less rainfall.

Figure 3.10: Rainfall levels for the south-west of England

Source: UK and England South West data: <http://www.metoffice.gov.uk>; Taunton: <http://www.myweather2.com>

3.8. Drainage

Hydrology

3.8.1. The scheme area is located within the catchments of 3 main rivers: the River Tone, the River Parrett and the River Isle. Whilst the existing A358 does not cross these watercourses, it does cross a number of their tributaries, most of which are indicated on Environment Agency mapping as having flood zones. At the west, the main tributaries of the River Tone that are directly affected by the scheme are Broughton Brook and Black Brook. The tributary of the River Parrett that is affected by the scheme is Widness Rhyne. This watercourse flows into the Parrett via the West Sedgemoor wet meadow. The eastern section of the scheme passes across the Fivehead River, Venner's Water, Cad Brook and Back Stream, all of which are tributaries of the River Isle.

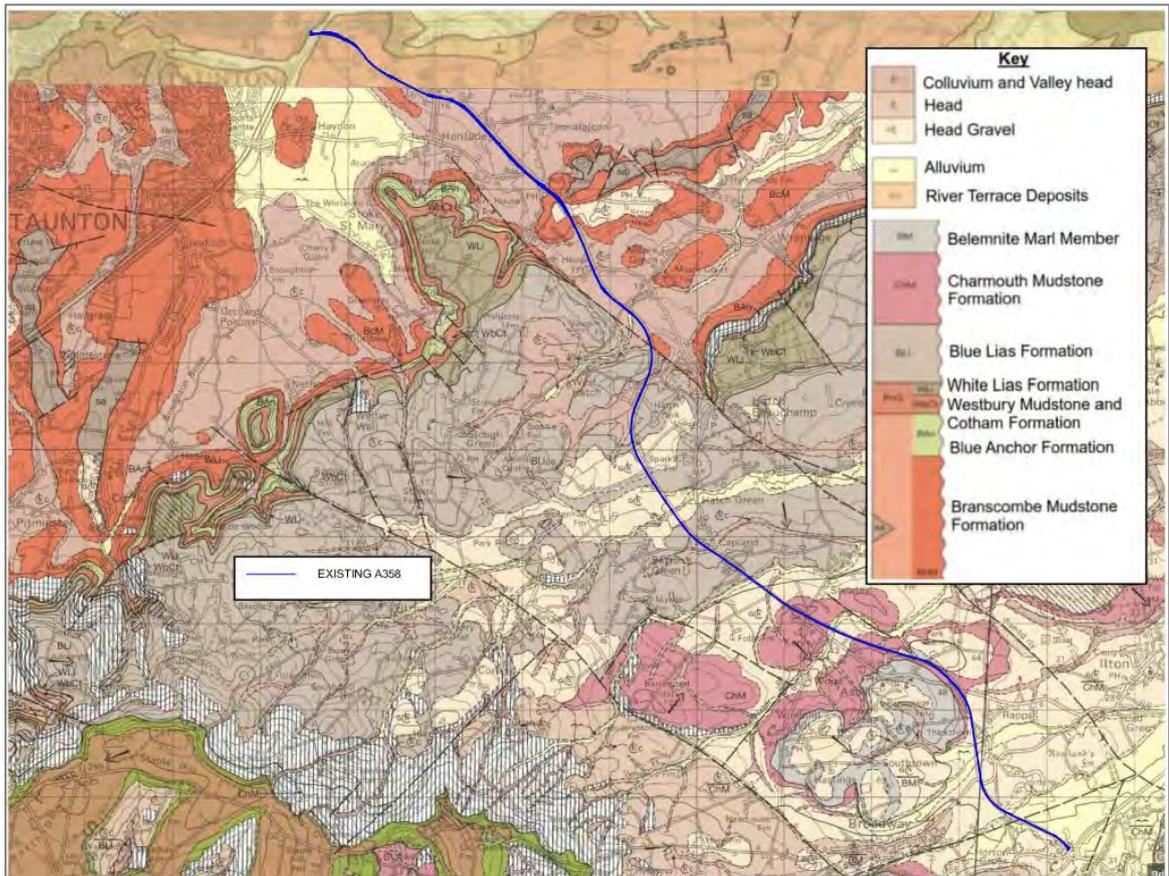
Road drainage

3.8.2. The existing drainage network along the section of the A358 between Taunton and Ilminster varies as the road switches from urban to rural categorisation. To the western end of the scheme the road is urban in character and hence the carriageway is kerbed on both sides of the road with kerb inlet gullies. The drainage system through this area is expected to have evolved periodically in line with the general urbanisation of the area, and it is unclear where the water drains once underground. However, it is assumed that road run-off eventually drains untreated into the River Tone via storm-water sewers, combined sewers or 1 of the many streams and drainage channels in the area.

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- 3.8.3. To the east of Thornfalcon the A358 becomes more rural in character. The drainage network here generally consists of splayed precast kerbs or surface water concrete channels when the road is at ground level or on an embankment, and filter drains when the road is in a cutting. Intermittent gullies are located with kerbs and in the inverts of the concrete channels. There are also several drainage ponds located along this eastern section which are used to store and treat surface run-off water before gradually releasing it into the neighbouring watercourses, namely the Widness Rhyne, Fivehead River, Cad Brook and the River Isle.
- 3.8.4. This section of the A358 was upgraded in the 1980s and 1990s as part of the Hatch Beauchamp and Ashill Bypass schemes. Some record drawings, obtained from Somerset County Council, confirm that the road drainage system was comprehensively redesigned and constructed as part of these schemes. The drainage along these sections is therefore likely to be more sophisticated than the existing drainage systems to the west of Thornfalcon, for which no records exist. It is likely that, west of Thornfalcon, the drainage has been upgraded over time on a piecemeal basis and may therefore not be as easy to integrate into the proposed scheme as the Ashill and Hatch Beauchamp Bypass drainage systems.
- 3.8.5. Away from the A358, the M5 near junction 25 currently drains into the Black Brook which subsequently flows into the River Tone, whilst the A303 near Southfields Roundabout drains into the River Isle.
- 3.8.6. The proposed drainage for each route option is explained as part of the Description of the Route Options in Section 7.

3.9. Geology

- 3.9.1. This section provides a brief overview of the geology of the area in the vicinity of all the proposed route options. The area is represented in the excerpt of the 1:50,000 scale British Geological Survey (BGS) geological sheets 311 and 295 as shown in Figure 3.11 below. The scheme options cross the boundaries of 2 BGS sheets. BGS sheet 295 to the north is awaiting an update and indicates more alluvium and drift deposits than sheet 311, hence the sheets do not overlap entirely.

Figure 3.11: Existing geology

Source: MMSJV based on extract from 1:50,000 BGS geological sheet 311 Wellington Bedrock and Superficial edition, (2009) and 1:50,000 BGS geological sheet 295 Taunton Solid and Drift (1984). This Map is based upon Ordnance Survey material with the permission of Ordnance Survey on behalf of the Controller of Her Majesty's Stationery Office © Crown copyright. Unauthorised reproduction infringes Crown copyright and may lead to prosecution or civil proceedings. Highways England 100030649 2016.

Superficial deposits

3.9.2. BGS mapping indicates limited expanses of superficial deposits along the proposed routes. The superficial deposits likely to be encountered across the site comprise:

- Alluvium (clay, silt and gravel), present at the ends of all the routes within the floodplains, and watercourses
- Colluvium and Valley Head (clay and sand), present variably throughout the routes
- Head (gravel), present variably throughout the routes particularly within the River Isle basin

3.9.3. According to the BGS mapping, no made-ground is identified. However, variable made-ground associated with historical features and the existing road network is anticipated.

- 3.9.4. Given the scale of the proposed works and uncertainty of the geological mapping, it is considered that local areas of unmapped superficial deposits may also be encountered.

Solid geology

- 3.9.5. The solid geology of the site, according to the BGS web-based *Geology of Britain Viewer*, comprises:

- Branscombe Mudstone Formation
- Blue Anchor Formation
- Westbury Mudstone and Cotham Formation
- White Lias Formation
- Blue Lias Formation
- Charmouth Mudstone Formation

3.10. Mining

- 3.10.1. According to records on the BGS web-based Coal Authority Interactive Viewer (Coal Authority Coal and Brine), it is unlikely that any coal mine workings present or past are in the vicinity of the route options. Metalliferous mining does not affect the area of study.

3.11. Public utilities

- 3.11.1. Enquiries undertaken highlight that several undertakers have equipment that may require protection or diversion as a result of the proposed options. These are described below.

Wessex Water

- 3.11.2. Wessex Water's records indicate a relatively extensive domestic supply network. Their waste network is more localised, confined to built-up areas and some of the larger settlements within the rural areas.
- 3.11.3. Records for waste-water indicate a sewer running across the scheme area from south to north through Orchard Portman. This crosses Stoke Road before running underneath the M5 motorway just south of Haydon Lane. There is also a sewer running across the scheme area from Stoke St Mary into Henlade.
- 3.11.4. The villages of Henlade, Ruishton, Hatch Beauchamp and Rapps are well served by mains sewers. Whilst these villages are close to the scheme area, the sewers appear to have local outfalls or tanks meaning that they are unlikely to be affected by the project.
- 3.11.5. Although Ashill also has a local sewage system, this is more likely to be affected as it drains underneath the existing A358 Ashill Bypass to a local sewage treatment works alongside its northern verge.

- 3.11.6. Records for water supply indicate a relatively extensive supply network in most settlements, connected along local roads (including the A358 through Henlade) between Taunton and the A378 junction at Mattock's Tree Green. From Mattock's Tree Green, the supply runs into Hatch Beauchamp along the original A358 and then into West Hatch, Hatch Green and Capland.
- 3.11.7. At Capland the supply re-joins the current A358 briefly to reach Ashill, where it again follows the original A358 through the village. To the east of Ashill there are several crossings of the A358 to supply villages such as Rapps and Broadway.

Western Power Distribution

- 3.11.8. Western Power Distribution's (WPD) records indicate a number of high and low voltage overhead and underground cables across the site. The following are likely to be directly affected by the scheme:
- Overhead high voltage cables crossing land between Henlade, Haydon and Taunton
 - An overhead high voltage cable running roughly parallel to the A358 (to the south) between Ash and Henlade. This cuts across Stoke Road
 - A north-south overhead high voltage cable to the west of the village of Ash and up to the A378 junction at Mattock's Tree Green
 - A low voltage overhead crossing of the existing A358 at Bath House Farm
 - An overhead high voltage crossing of the A358 Hatch Beauchamp Bypass, to the north of Griffin Lane
 - Overhead high and low voltage cables in the verge of the existing A358 between Capland and Ashill
 - Overhead high voltage crossing of the existing A358 between Capland and Ashill
 - Underground high voltage crossing of the A358 Ashill Bypass (providing supply to the Ashill Sewage Works which are just to the north of the road)
 - A north-south overhead cable running adjacent to the Ashill Bypass at Rapps, with a spur running across the A358
 - A high voltage underground crossing of the existing A358 at Southfields Roundabout

National Grid

- 3.11.9. National Grid have provided records indicating the presence of two National High Pressure (NHP) gas mains towards the southern end of the scheme. One of the pipelines appears to cross the existing A303 Ilminster Bypass approximately 100 metres east of the Southfields Roundabout, and the second crosses the A358 approximately 0.9 miles (1.5 kilometres) north of the roundabout.

Scottish and Southern Energy

- 3.11.10. Scottish and Southern Energy's (SSE) records show that they have a telecommunications cable running in the southern verge of the A303 Ilminster Bypass. At the Southfields Roundabout, this cable continues within the circulatory carriageway across the A358 arm and then continues in the southern verge of the local road into Horton Cross.

BT Openreach

- 3.11.11. BT's records indicate an extensive network of underground and overhead cables throughout the scheme area.
- 3.11.12. Cables run alongside the majority of local roads through Henlade, Ruishton, Haydon and Stoke St Mary, and also alongside the A358 through Henlade and up to the A378 junction at Mattock's Tree Green. From Mattock's Tree Green, the cables follow the original A358 into Hatch Beauchamp rather than around the Hatch Beauchamp Bypass.
- 3.11.13. The cables run through Hatch Beauchamp and then rejoin the current A358 at Capland. The cables run along the current A358 briefly until Ashill. Once in Ashill the cables again follow the original A358 carriageway through the village rather than around the Ashill Bypass, and then through Rapps and Horton. There are a number of overhead feeds to adjacent property and settlements along the entire length of the cable from Henlade to Horton, many of which cross over the current A358.

Vodafone

- 3.11.14. Vodafone have provided information indicating that they have a cable running in the northern verge of the existing A358 from the junction 25 roundabout through Henlade, Mattock's Tree Green, around the Hatch Beauchamp Bypass and on to Ashill. At the western end of the Ashill Bypass the cable crosses the road and, from that point onwards, the cable runs in the southern verge of the original A358 through Ashill village until it re-joins the current A358 carriageway.

Instalcom

3.11.15. Instalcom, representing Global Crossing (now Level 3 Communications), have provided records indicating a fibre optic cable following the A303 Ilminster Bypass and up the A358 as far as the local road known as Greenway Lane (just west of the A378 junction). At this point the cable follows Greenway Lane and Haydon Lane, crossing the M5 in the deck of Haydon Lane overbridge.

Wales & West Utilities

3.11.16. The search of Wales & West Utilities records revealed that the domestic gas supply network is relatively limited within the scheme area.

3.11.17. There is a well-established supply network within residential areas of Taunton, to the west of the M5 corridor. This extends across the M5 in the decks of the Stoke Road and B3170 overbridges to supply property properties in Haydon and Orchard Portman, and passes through junction 25 to provide supply to Ruishton and Henlade.

3.11.18. There is a small local gas supply in the village of Hatch Beauchamp, although this appears to be fed from a pipeline to the north of the scheme, beyond the limits of the search that was undertaken.

3.11.19. Mapping has been obtained from Wales & West for the southern section of the scheme including areas around the villages of Ashill, Ilton and Rapps, and this indicates that there are no mains gas supplies in these rural areas.

3.12. Environment**Noise**

3.12.1. Eleven Noise Important Areas (NIAs) are located within 500 metres of the proposed scheme options. See the Environmental Constraints Plan (Appendix B3) for details.

3.12.2. There are sensitive receptors within 500 metres of the scheme options. These include between 300-1000 residential properties, 10-20 farms and 10-15 commercial properties, with the actual number of each depending on the option.

3.12.3. There is currently no baseline noise data within the vicinity of the scheme. Therefore, in support of the scheme and future environmental assessment, baseline noise monitoring would be undertaken at locations representative of sensitive receptors within the study area. This would be undertaken in future stages prior to the production of the Environmental Statement.

Local air quality

- 3.12.4. Based on 2015 roadside NO₂ concentration projected by the Defra Pollution Climate Mapping model, as well as information available on the Departments for Environment Food and Rural Affairs website (Defra, 2016) no links exceeding the annual air quality objective limit value of 40µg/m³ are present within 6.2 miles (10 kilometres) of the A358 between Taunton and Southfields Roundabout. The highest concentration within the scheme limits is 33.9µg/m³.
- 3.12.5. In terms of Air Quality Management Areas (AQMA), Henlade AQMA, located on the existing A358 has been declared for exceedances in the national NO₂ annual mean objective.
- 3.12.6. In addition, Taunton Deane Borough Council has registered within their Air Quality Progress Report and Action Plan Progress Report (2011), 2 exceedances of the annual mean nitrogen dioxide (NO₂) objective in 2010 in the East Reach AQMA, which is situated approximately 0.6 miles (1 kilometre) from the scheme. Cullompton AQMA is located approximately 16 miles (26 kilometres) southwest of the scheme, and East Devon AQMA (located in East Devon District) is located approximately 15 miles (24 kilometres) southwest of the scheme. Both of these AQMAs have also been declared due to exceedances of the NO₂ annual mean Air Quality Objective (AQO).
- 3.12.7. Due to the lack of baseline air quality data in the vicinity of the scheme options, a 6-month air quality monitoring survey was undertaken on behalf of Highways England from December 2015 to May 2016. Monitoring was carried out at 25 locations along roads near the proposed scheme options.
- 3.12.8. There are several residential properties representing sensitive receptors within the vicinity of the scheme options.

Greenhouse gases

- 3.12.9. There is no baseline data for greenhouse gases beyond that which is derived from existing vehicle flows that provide the baseline for the WebTAG Greenhouse Gases Appraisal.

Landscape

- 3.12.10. There are no National Parks or Heritage Coastlines located within the scheme study area. However, the Blackdown Hills are located to the south and west of the existing A358 and are nationally designated as an Area of Natural Outstanding Beauty (AONB).

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- 3.12.11. All scheme options sit within 4 National Character Areas (NCAs), which are 140 Yeovil Scarplands (NE557), 143 Mid Somerset Hills (NE564), 146 Vale of Taunton and Quantock Fringes (NE550) and 147 Blackdowns (NE566). Those NCAs comprise a diverse and complex landscape with considerable local variation representing physical and economic influences; much of it has been formed and maintained by human activity, in particular through agricultural practices.
- 3.12.12. The landscape character within the vicinity of the existing A358 is largely rural, with a varied agricultural land use system and arrangement of villages, hamlets and scattered farms and dwellings. The landscape topography also varies along the A358 length, with two relatively flat areas (the Vale of Taunton in the northwest and the upper vale of the River Isle in the southeast) connected by the foot slopes of the Blackdown Hills. Broughton Brook and the River Tone are notable features within the Vale of Taunton landscape, both situated alongside the M5.
- 3.12.13. There are many visual receptors located within the scheme's likely Zone of Theoretical Visibility (ZTV), including approximately 228 footpaths, 21 bridleways and 5 restricted byways. There are also a number of elevated views of the scheme area.

Townscape

- 3.12.14. Several settlements in combination with a varied agricultural land use system lie along the existing A358 at the villages of Ashill, Stewley, Hatch Beauchamp, Stoke St Mary and Henlade. In addition, the villages of Bickenhall and Orchard Portman are part of the scheme study area.

Heritage and historic resources

- 3.12.15. Poundisford Park Pale Scheduled Monument and Poundisford Park Grade II Registered Park and Garden are located within the scheme area, as are a Cross in St. Aldhelm and St. Eadburga churchyard Scheduled Monument, (Grade II*).
- 3.12.16. There are many listed buildings within 0.6 miles (1 kilometre) of all scheme options, consisting of Grade I, Grade II and Grade II* listed buildings. In addition, there are Conservation Areas in Hatch Beauchamp and Taunton.
- 3.12.17. There are records of archaeological events and finds within the scheme area, many of which run along the existing A358. The archaeological assets include properties from medieval and Roman age, a 13th century church, 16th century mansion, prehistoric settlement, a medieval Deer Park, an 18th century Deer Park, 17th century Corn Mill, a 14th century Moat and a medieval potsherd.

Biodiversity

- 3.12.18. There are no Special Areas of Conservation (SACs), Special Protection Areas (SPAs) or Ramsar designated sites within 1.2 miles (2 kilometres) of the proposed scheme options. However, there are 4 SACs designated for bat populations located within 18 miles (30 kilometres) of the scheme. These are Hestercombe House SAC, Bracket's coppice SAC, Exmoor & Quantock Oakwoods SAC, and Beer Quarry and Caves SAC. Somerset Levels and Moors SPA and Ramsar is located 2 miles (3.5 kilometres) to the northeast of the scheme options.
- 3.12.19. There is one Site of Special Scientific Interest (SSSI) within the study area, namely Thurlbear Wood and Quarrylands SSSI.
- 3.12.20. There are no National Nature Reserves (NNRs) or Royal Society for the Protection of Birds (RSPB) Reserves nearby. However, there are 34 Local Wildlife Sites (LWS) located within the vicinity of the scheme options and also 3 Local Nature Reserves (LNR).
- 3.12.21. Various habitats have been recorded within the scheme area during the Extended Phase 1 Habitat Survey, undertaken between March and May 2016. This survey work in combination with the desktop study has identified habitats suitable to support bats, breeding birds, barn owls, kingfisher, badgers, dormouse, reptiles, white-clawed crayfish, great crested newts, otters, and water voles.
- 3.12.22. Biodiversity Action Plan (BAP) Priority Habitats are also located within the scheme study area, including Ancient Woodland, Deciduous Woodland, Wood-pasture and Parkland, Lowland Calcareous Grassland, Coastal and Floodplain Grazing Marsh, Traditional Orchards and Lowland Meadows.

Water environment

- 3.12.23. The Environment Agency's indicative flood mapping shows that the scheme options are partially situated within Flood Zones 2 and 3. Flood Zone 2 comprises land assessed as having between a 1-in-100 and 1-in-1,000 (1%-0.1%) chance of flooding from fluvial sources each year. Flood Zone 3 comprises land assessed as having a 1% or 1-in-100 or greater chance of flooding from fluvial sources (>1%) each year. The indicative flood mapping also shows that there are areas within the study area at risk of flooding from surface water, particularly along the existing A358 within areas identified as Flood Zones 2 and 3. Based on the Water Framework Directive (WFD) (Directive 2000/60/EC), it is not considered that the risk of groundwater flooding is significant, as the aquifers within the catchments are generally at some depth.

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- 3.12.24. None of the scheme options fall within a Surface Water Nitrate Vulnerable Zone and there is no underlying groundwater protection zone within the study area.
- 3.12.25. There are 7 WFD waterbodies within proximity to the scheme options, namely the Rivers Ding, Isle, Verne's water, Fivehead River, Broughton Brook - South and West Somerset, Black Brook and Tone Ds Taunton. Several ponds have also been identified within the study area.

Physical fitness

- 3.12.26. There are many Public Rights of Ways (PRoWs) and restricted byways within the vicinity of the scheme options including several dozen footpaths, 2 Sustrans cycle routes, 12 bridleways and 2 long distance paths.

Journey ambience

- 3.12.27. The view from the road to the north and the south of the existing A358 is largely rural, with varied agricultural land use, as well as views of settlements combined with the undulating and elevated topography of the surrounding landscape.
- 3.12.28. At present the A358 between Taunton and Southfields Roundabout can experience delays and congestion during peak times.

3.13. Accessibility

Other available transport services

- 3.13.1. The nearest railway line is present to the south of Bathpool. Taunton Railway Station is the nearest railway station, located approximately 1.8 miles (3 kilometres) to the north of the scheme. Royal Naval Air Station (RNAS) Merryfield (formerly known as RAF Merryfield) is situated approximately 0.6 miles (1 kilometre) to the east of the scheme. A large number of bus and coach services are known to utilise the existing A358 between Taunton and Ilminster, with bus stops on the A358 between Taunton and Thornfalcon, and additional stops at Hatch Beauchamp and Ilminster. There is also a Park-and-Ride facility located to the south of M5 junction 25 which provides further bus services into the centre of Taunton.

Severance

- 3.13.2. Many Public Rights of Ways (PRoWs), undesignated paths and cycle routes are situated within the vicinity of the scheme, a number of which are severed by the existing A358, A303 and M5 roads. Crossings suitable for non-motorised users (NMU) are not common features in the area. There is an NMU bridge over the M5 at Poundisford Park, a signalised crossing of the A358 at the Park-and-Ride site and 2 uncontrolled crossings at Henlade. Footways run alongside the A358 between the M5 junction 25 and Henlade, with no further facilities alongside the A358 until Southfields Roundabout in the south. There are also a number of community facilities either side of the A358 such as schools, public houses, places of worship and shops. There is potential for existing traffic flows on the A358 to significantly impede NMU movements, including vulnerable social groups.

Access to the transport system

- 3.13.3. Vulnerable social groups are likely to be present throughout the scheme area. The area to the west of the A358 and south of the M5 is predominantly rural and therefore there may be people who rely on public services to maintain accessibility to essential services. People with children are another vulnerable social group likely to be present within the local area. Somerset Progressive School is located adjacent to the A358, whilst Ashill Community Primary School is situated approximately 100 metres south of the scheme options.
- 3.13.4. The A358 corridor is known to be utilised by a number of bus and coach services which connect Taunton and Ilminster to the rest of the south west region. Approximately 14 bus or coach service routes have been identified which operate along roads within the vicinity of the scheme options. These include Somerset service numbers 29, 30, 51, 54, 55, 96C, 98, 99, 99A, 901, N10, N10C, Superfast 2 and the Taunton Park-and-Ride. Key destinations served by these public transport corridors and also within the vicinity of all scheme options include Taunton, Ilminster, Ruishton, Henlade, Ash, Hatch Beauchamp and Ashill, with additional services to isolated properties in part.

3.14. Integration

Transport interchange

- 3.14.1. The existing A358 ties in with the M5 junction 25 at Taunton and with the A303 at Southfields Roundabout, near to Ilminster. The A378 extends eastward toward Langport from the A358 to the south of Thornfalcon. There are no other connections to major road networks along this section of the A358, although there are a large number of minor roads which meet the A358 and 4 bridges over the M5 within the vicinity of the scheme.

- 3.14.2. Taunton Bus Station is located in the town centre. The majority of operators connect to this public transport hub and together provide a well-developed service both locally and further afield to the south west region, London and the north. Companies including National Express, Buses of Somerset and Stagecoach South-West all pass through Taunton. There are also 2 Park-and-Ride sites, namely Silk Mills to the west of Taunton and Taunton Gateway situated near the M5 junction 25, which provide services into the centre of Taunton.
- 3.14.3. Taunton Railway Station is situated approximately 0.6 miles (1 kilometre) from the Bus Station and is managed by Great Western Railway. In 2014-15 it served approximately 1.3 million trips providing services to London Paddington in the east and Penzance farthest west.

Land use policy for South Somerset District Council and Taunton Deane Borough Council administrative areas

- 3.14.4. The South Somerset District Council (SSDC) Local Plan 2006-28 was adopted in 2015 and is a collection of policies which set out the long-term vision and strategic context for managing and accommodating growth within South Somerset until 2028. Taunton Deane Borough Council's (TDBC) Core Strategy 2011-28 sets out its long-term strategy with regard for developments over the next 15 years, whilst also including policies for the control of development across the Borough. Somerset County Council's (SCC) Future Transport Plan sets out SCC's long-term strategy for getting the best from transport. Together, these documents set out local requirements for land use policy, for accessibility and the integration of different forms of transport in Somerset.
- 3.14.5. Table 3.6 below identifies and summarises relevant policies relating to land use, accessibility and transport integration. Further information on local planning and land use policies can be found in Section 4 of this report.

Table 3.6: Land use, accessibility and transport integration summary for SCC, SSDC and TDBC

Local Policy	Policy Summary
Somerset County Council Future Transport Plan 2011- 2026	
Policy SUS2 Bus and Community Transport Services	SCC will ensure that essential services are maintained where possible in the early years of the plan and work to improve the way services work together in the later years of the plan.
Policy SUS 3 Smarter Choices	SCC will help people make smarter travel choices through providing high quality transport information and encouraging organisations to develop Transport Plans.
Policy SUS 4 Cycling	SCC will support the provision of appropriate and well-connected cycling facilities.
Policy SUS 5 Walking	SCC will help people make more trips on foot and see the benefits of walking.
Policy SUS 6 Rights-of-way	SCC will work to maintain Rights of Way and improve information available to use them.
Policy SUS 7 Rail	SCC will work with the rail industry and stakeholders to encourage traveling by train.

Local Policy	Policy Summary
Policy HLT 1 Stay Active	SCC will give more opportunities to travel in a healthy way, such as by walking or cycling.
South Somerset District Council Local Plan 2006- 2028 (Adopted 2015)	
Policy TA1: Low Carbon Travel	New residential and employment developments should where possible provide: Travel Information Packs, charging points for electric vehicles, Green Travel Vouchers for 1 year to use sustainable transport, cycle parking facilities, Travel Plans and ensure sustainable transport measures are in place. New residential dwelling developments should enable ease of working at home. Where new residential/employment sites would impact existing public transport planning obligations improved public transport connections increasing accessibility should be delivered.
Policy TA2: Rail	The council will encourage the promotion and protection of land for rail infrastructure development.
Policy TA4: Travel Plans	Travel Plans will be required depending on the size and scale of a development. SSCDC sets out the thresholds for development size determining which type of Travel Plan should be in place.
Policy TA5: Transport Impact of a New Development	All new developments are required to address transport implications and to maximise the potential for sustainable transport through safeguarding existing and new transport infrastructure; securing inclusive, safe and convenient NMU access; ensuring the predicted nature and volume of traffic and parked vehicles generated by the development would not have a detrimental impact on the character or amenity of the area; ensuring that proposals which require access to the strategic road network are well located on the network; assessing the transport impact of a development with larger schemes with Transport Assessments and requiring car parking/ vehicle servicing at levels appropriate to the development.
Taunton Deane Borough Council Adopted Core Strategy 2011- 2028 (Adopted 2012)	
Policy CP 5 Inclusive Communities	Developments will promote sustainable development that creates social cohesive and inclusive communities, reduce inequalities, promote well-being and address accessibility to health, inclusive housing, training, education, places of worship, leisure and other community facilities.
Policy CP 6 Transport	Developments should contribute to reducing the need to travel, improve accessibility to jobs, services and community facilities and mitigate and adapt to climate change.
Policy CP 7 Infrastructure	TDBC will work with partners to ensure that infrastructure is in place at the right time and supports growth set out in the Core Strategy. It will also secure developer contributions towards provision of physical, social and green infrastructure.

Other government policies

3.14.6. The National Planning Policy Framework (NPPF) and National Policy Statement for National Networks (NPSNN) both require developers to promote sustainable transport, improve accessibility and integrate transport modes. The government requires local authorities to work with transport providers and neighbouring authorities to develop strategies for the provision of large scale roadside facilities to support growth of ports, airports or other major generators of travel demand in their areas and maximise sustainable transport modes. A Transport Statement or Transport Assessment is required for all developments that generate significant movements of traffic. Planning decisions will consider whether opportunities for sustainable transport modes have been taken up, safe and suitable access to sites can be achieved for all people, whilst requiring that developments only be prevented or refused on transport grounds where residual cumulative impacts are severe. Furthermore, the protection and enhancement of Public Rights of Way and access is

encouraged. For instance, where the national road network severs communities and community facilities and acts as a barrier for walking and cycling, developers are expected to correct historic problems and ensure easier and safer access for NMUs. The government's strategy for improving accessibility for disabled people is set out in Transport for Everyone, which is an action plan to improve accessibility for all. Compliance with the Equalities Act (2010) is also expected.

- 3.14.7. Further information on guidance at a national level can be found in Section 4.1 of this report.

3.15. Maintenance and repair statement

- 3.15.1. The M5 motorway (including works along the A358 on the approaches to junction 25) was constructed in the early 1970s. The A303 Ilminster Bypass was constructed in the late 1980s. The southern section of the A358 between Mattock's Tree Green and Southfields Roundabout comprises two bypasses – the Ashill Bypass which was constructed in the early 1990s and the Hatch Beauchamp Bypass which was constructed in the mid-1980s. The existing dual carriageway section through Thornfalcon and into Henlade appears to comprise of a succession of upgrades to the original route, probably dating back to the 1960s and 1970s.
- 3.15.2. The M5 motorway and the A303 Ilminster Bypass are part of Highways England's Strategic Road Network and are maintained by suppliers contracted to them. The A358 between Taunton and Southfields Roundabout is part of Somerset County Council's road network. However, the Road Investment Strategy states that improved sections will be brought into the Strategic Road Network and so an upgraded A358 would be adopted by Highways England following construction of the scheme should this scheme progress.
- 3.15.3. The surfacing of the A303 Ilminster Bypass appears to consist of the original jointed concrete pavement. Good records of the existing A303 and M5 road drainage systems exist on the Highways Agency Drainage Data Management System (HADDMS).
- 3.15.4. Inspections of the majority of structures expected to be affected by the scheme previously promoted on this route were undertaken in 2004 in order to inform the development of that scheme. Reports from these inspections show the majority of structures to be in good condition with no signs of distress. However, the assessed capacity of the 2 bridges that carry the M5 carriageway over the junction 25 gyratory is restricted due to the shear capacity at corner bearings. It was also noted that the columns fail under collision loading assessment. Furthermore, the Griffin Lane Underbridge was found to be inadequate for permanent loading due to shear failure in the voided central span of the deck. This bridge carries the A358 Hatch Beauchamp Bypass over Griffin Lane near West Hatch. Strengthening work

has been undertaken on this structure since, and from records provided the structure should, subject to re-assessment if significant changes are required to the layout or number of traffic lanes carried by the structure, be suitable for incorporation within the scheme.

- 3.15.5. No further information is available regarding the condition of the A358.
- 3.15.6. Further liaison will be required with Highways England and Somerset County Council. Further details of the condition of the road and associated infrastructure will be explored, particularly for potential sections of online widening where there is an opportunity to integrate the existing carriageway into the scheme as 1 half of the proposed dual carriageway. In these circumstances, it will be necessary to determine the residual life of the existing pavement and structures in order to assess the level of rehabilitation needed to incorporate them into the works.

4. Planning factors

4.1. Legislation and guidance

Legislation

4.1.1. Relevant international and national land use planning and environmental legislation applicable to the scheme constraints has been listed in Table 4.1 below³.

Table 4.1: International and National Land Use and Environmental Legislation

Topic	Legislation
Air Quality	<p><u>International</u></p> <p>The Ambient Air Quality Directive (2008/50/EC) - Sets legally binding limits for concentrations in outdoor air of major air pollutants that impact public health such as particulate matter (PM₁₀ and PM_{2.5}) and nitrogen dioxide (NO₂).</p> <p>The scheme needs to ensure that pollutant limits are not exceeded.</p> <hr/> <p><u>National</u></p> <p>The Air Quality Standards Regulations 2010 – Implements the EU’s Directive 2008/50/EC and transposes the Directive’s binding limit values into ‘air quality standards’ (AQSs) with attainment dates in line with the Directive. The standards are based on the assessment of the effects of each pollutant on human health including the effects on sensitive groups or on ecosystems.</p> <p>The scheme would need to ensure that pollutant limits are not exceeded and that sensitive receptors are not adversely affected.</p> <p>Air Quality (England) Regulations 2000 and Air Quality (England) (Amendment) Regulations 2002 – Set out air quality objectives within a given time period for local authorities in carrying out the air quality management duties in accordance with Part IV of the Environment Act 1995 which required the Secretary of State to produce an action plan (the Air Quality Strategy). The Act also requires local authorities to monitor the air quality in their area and designate Air Quality Management Areas (AQMAs) where air quality objectives are not being achieved or are unlikely to be achieved by the relevant compliance date. Local authorities must then prepare an Air Quality Action Plan which sets out measures to pursue the achievement of the air quality objectives within the AQMA.</p> <p>The scheme needs to ensure that air quality objectives are met.</p> <p>There are 4 AQMAs in the vicinity of the Scheme, including:</p> <ul style="list-style-type: none"> • Henlade AQMA (located in Taunton Dean Borough) is between 0.25 miles (0.4 kilometres) and 0.6 miles (1 kilometre) north of the scheme; • East Reach AQMA (located in Taunton Dean Borough) is approximately 1.5 miles (2.5 kilometres) north west of the scheme; • Cullompton AQMA (located in Mid Devon District) is approximately 16 miles (26 kilometres) south west of the scheme; and, • East Devon AQMA (located in East Devon District) is approximately 15 miles (24 kilometres) south-south west of the scheme. <p>The Environmental Protection Act 1990, Section 79(1)(d) - Defines 1 type of ‘statutory nuisance’ as ‘<i>any dust, steam, smell or other effluvia arising on industrial, trade or business premises and being prejudicial to health or a nuisance</i>’. Where a local authority is satisfied that a statutory nuisance exists, or is likely to occur or recur, it must serve an abatement notice.</p> <p>The scheme construction must be controlled to avoid such concern</p>

³ The legislation included in Table 4.1 contains key relevant legislation and is not exhaustive.

Topic	Legislation
Cultural Heritage	<p><u>International</u> No legislation applicable</p> <hr/> <p><u>National</u> The Ancient Monuments and Archaeological Areas Act 1979 – Provides for the protection of Scheduled Monuments through a designated schedule of monuments and also allows the Secretary of State to designate areas of archaeological importance. Relevant with regard to Scheduled Monuments that have the potential to be affected by the scheme. The Planning (Listed Buildings and Conservation Areas) Act 2009 – Provides for the protection of Listed Buildings and Conservation Areas. Relevant with regard to Listed Buildings that have the potential to be affected by the scheme.</p>
Landscape	<p><u>International</u> No legislation applicable</p> <hr/> <p><u>National</u> Countryside and Rights of Way (CRoW) Act 2000 – Places a duty on Government Departments to have regard for the conservation of biodiversity and maintain lists of species and habitats for which conservation steps should be taken or promoted. Specifically, the Act places a statutory duty on relevant authorities to have regard to the purpose of conserving and enhancing the natural beauty of the AONB when exercising or performing any functions affecting land in the AONB. There are habitats and species of conservation importance within the scheme study area. Blackdown Hills AONB lies just to the south.</p>
Nature Conservation and Biodiversity	<p><u>International</u> The Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention) – The Convention has 3 ‘pillars’ of activity: the designation of wetlands of international importance as Ramsar sites; the promotion of the wise-use of all wetlands in the territory of each country; and international co-operation with other countries to further the wise-use of wetlands and their resources. There is a Ramsar Site approximately 2 miles (3.5 kilometres) to the northeast of the scheme. The EC Directive on the Conservation of Natural Habitats and of Wild Flora and Fauna (‘Habitats Directive 1982’) (as amended) (92/43/EEC) – Promotes the maintenance of biodiversity by requiring Member States to take measures to maintain or restore natural habitats and wild species listed on the Annexes to the Directive at a favourable conservation status, introducing robust protection for those habitats and species of European importance. There are protected habitats and species within the scheme study area. The EC Directive on the Conservation of Wild Birds (‘Birds Directive 1979’) (as amended) (79/409/EEC) -Provides a framework for the conservation and management of, and human interactions with, wild birds in Europe. There are habitats suitable for wild birds, including nesting and breeding birds, within the scheme study area.</p> <hr/> <p><u>National</u> Wildlife and Countryside Act 1981 (as amended) – Protects all wild birds, certain wild animals and certain wild plants. There are habitats and species of conservation importance within the scheme study area Conservation of Habitats and Species Regulations 2017 – Provide for the designation and protection of ‘European sites’, the protection of ‘European protected sites’, and the adaptation of planning and other controls for the protection of European sites. There are 4 Special Areas of Conservation designated for their bat populations within 18 miles (30 kilometres) of the existing A358, namely Hestercombe House SAC, Bracket’s coppice SAC, Exmoor & Quantock Oakwoods SAC, and Beer Quarry and Caves SAC.</p>

Topic	Legislation
	<p>Countryside and Rights of Way (CROW) Act 2000 – Places a duty on Government Departments to have regard for the conservation of biodiversity and maintain lists of species and habitats for which conservation steps should be taken or promoted.</p> <p>There are habitats and species of conservation importance within the scheme study area.</p> <p>Natural Environment and Rural Communities (NERC) Act 2006 – Requires public bodies, including local authorities, ‘to have regard to the conservation of biodiversity in England’ when carrying out their normal functions.</p> <p>There are habitats and species of conservation importance within the scheme study area.</p>
Noise and Vibration	<p><u>International</u></p> <p>EC Directive on the assessment and management of environmental noise (2002/49/EC) - Sets out a common approach to avoid, prevent and reduce the effects on human health of exposure to noise, through an assessment of noise in Member States. Such information should be made available to the public.</p> <p>Both construction and operation phases for the scheme have the potential to reduce or increase noise levels at sensitive receptors.</p> <hr/> <p><u>National</u></p> <p>The Environmental Protection Act 1990, Part III – Under Part III of the Act, certain matters are declared to be ‘statutory nuisances’, including ‘noise that is prejudicial to health or a nuisance and is emitted from or caused by a vehicle, machinery...’</p> <p>Construction activities must be managed using best-practice measures to avoid ‘statutory nuisance’.</p>
Road Drainage and the Water Environment	<p><u>International</u></p> <p>The EC Water Framework (WFD) Directive (2000/60/EC) – Sets an overarching programme to deliver long-term protection of the water environment and to improve the chemical and ecological health of all waters (groundwater and surface water) and associated wetlands.</p> <p>There are seven WFD waterbodies within close proximity to the scheme.</p> <p>The EC Directive on the Conservation of Natural Habitats and of Wild Flora and Fauna (‘Habitats Directive 1982’) as amended (92/43/EEC) – Promotes the maintenance of biodiversity by requiring Member States to take measures to maintain or restore natural habitats and wild species listed on the Annexes to the Directive at a favourable conservation status, introducing robust protection for those habitats and species of European importance.</p> <p>There are rivers, streams and areas of standing water with the potential to support biodiversity in the vicinity of the scheme that require protection.</p> <p>The EC Directive on the Conservation of Wild Birds (‘Birds Directive 1979’) as amended (79/409/EEC) - Provides a framework for the conservation and management of, and human interactions with, wild birds in Europe.</p> <p>There are a large number of waterbodies with the potential to support wild birds in the vicinity of the scheme that require protection.</p> <hr/> <p><u>National</u></p> <p>The Water Environment (WFD) (England and Wales) Regulations 2003 – Implements the WFD Directive into UK Legislation to ensure that the objectives of the Water Framework Directive are met.</p> <p>There are seven WFD waterbodies within close proximity of the scheme.</p> <p>The Flood and Water Management Act 2010 – Makes provisions about water, including provision about the management of risks in connection with flooding and coastal erosion.</p> <p>The scheme options lie within Flood Zones 2 and 3.</p>
People and Communities	<p><u>International</u></p> <p>Not applicable</p> <hr/> <p><u>National</u></p> <p>Not applicable</p>

Topic	Legislation
Geology, Soils and Materials	<p><u>International</u></p> <p>The EC Water Framework Directive (WFD) (2000/60/EC) - Sets an overarching programme to deliver long-term protection of the water environment and to improve the chemical and ecological health of all waters (groundwater and surface water) and associated wetlands.</p> <p>There are seven WFD waterbodies within close proximity of the scheme.</p> <p>The EC Framework Directive on Waste (2008/98/EC) – Requires member states to take appropriate measures to encourage the prevention or reduction of waste production and its harmfulness, and secondly the recovery of waste by means of recycling, re-use or reclamation or any other process with a view to extracting secondary raw materials, or the use of waste as a source of energy.</p> <p>The scheme construction activities must be controlled to ensure best-practice waste management.</p> <hr/> <p><u>National</u></p> <p>The Environmental Protection Act (EPA) 1990, Part II – This section sets out a regime for regulating and licencing the acceptable disposal of controlled waste on land. Controlled waste is any household, industrial and commercial waste. Part II stipulates that controlled waste must be treated, stored and disposed of in a manner that is not likely to cause pollution of the environment or harm to human health.</p> <p>The construction of the scheme must include best-practice measures for managing controlled waste.</p> <p>The Environmental Protection Act (EPA) 1990, Part IIA – Part IIA principally deals with sites where individual historic contamination linkages present a “Significant Possibility of Significant Harm” (SPOSH) or a “Significant Possibility of Significant Pollution to Controlled Waters” (SPOSPCOW) representing an unacceptable level of contamination risk for each linkage.</p> <p>There are a number of historic landfills and one authorised landfill in close proximity to the scheme with the potential for contaminated land to be present.</p> <p>The Contaminated Land (England) Regulations 2006 (as amended) – Set out provisions relating to the identification and remediation of contaminated land under Part 2A of the Environmental Protection Act 1990.</p> <p>There are a number of historic landfills and one authorised landfill in close proximity to the scheme with the potential for contaminated land to be present.</p> <p>Waste (England and Wales) Regulations 2011 (as amended) – Require organisations to confirm that they have applied the Waste Hierarchy, ensuring that waste is dealt in the priority of prevention, preparation for re-use, recycling, other recovery, and disposal.</p> <p>Any waste generated during the construction of the proposed scheme must be dealt with in line with the Waste Hierarchy.</p> <p>The Hazardous Waste (England and Wales) Regulations 2009 – Define what constitutes hazardous waste and set out the controls on handling such wastes. The movement of hazardous waste is to be documented by a system of consignment notes.</p> <p>The construction of the scheme must include best-practice measures to control any hazardous waste.</p> <p>Environmental Protection (Duty of care) Regulations 1991 – Sets out the documentary requirements as part of waste management. Transfers of waste must be accompanied by a transfer note containing a description of the waste, details concerning the ‘transferer’ and the ‘transferee’, and the place and time of the transfer.</p> <p>The construction of the scheme must include best-practice measures for the management of controlled waste.</p> <p>Clean Neighbourhoods and Environment Act 2005 – Sets out new provisions for local environmental and social issues such as litter, fly-tipping and anti-social behaviour.</p> <p>Relevant during the construction of the scheme.</p> <p>Landfill (England and Wales) Regulations 2002 (as amended) – Aims to reduce the negative environmental and health impacts associated with landfilling waste.</p> <p>The scheme construction must include best-practice measures for controlling waste that cannot be used and will therefore need to be landfilled.</p>

Topic	Legislation
	<p>Control of Substances Hazardous to Health Regulations 2002 (COSHH) and the Construction (Design Management) Regulations 2015 (CDM, 2015) – Under these sets of regulations, where a developer knows or suspects the presence of contaminated soil, provision must be made to ensure that risks to the public and site works are controlled.</p> <p>There are a number of historic landfills and one authorised landfill in close proximity to the scheme with the potential for contaminated land to be present.</p>
Environmental Planning	<p><u>International</u></p> <p>The Environmental Impact Assessment (EIA) Directive (2011/92/EU) (as amended) – Before development consent is given, Member States must take all measures necessary to make sure that projects likely to have significant effects on the environment by virtue of their nature, size or location are subject to an Environmental Impact Assessment (EIA).</p> <hr/> <p><u>National</u></p> <p>The Planning Act 2008 – Establishes a system to deal with Nationally Significant Infrastructure Projects (NSIPs) and also to introduce a community infrastructure levy that can be charged on developers by local authorities.</p> <p>The area of development for the scheme options is, on average, 80 hectares, which exceeds the relevant threshold of 12.5 hectares in section 22 (4) (b) of the Planning Act 2008 for the construction or alteration of highways, other than motorways, where the speed limit for any class of vehicle is expected to be 50 miles per hour or greater. The scheme is therefore considered an NSIP for the purposes of sections 14 (1) (h) and 22 of the 2008 Act.</p> <p>The Highway and Railway (Nationally Significant Infrastructure Project) Order 2013 – Made amendments to the Planning Act 2008 to ensure that highway-related development is only considered an NSIP where it exceeds specific limits and or is likely to have significant effects on the environment.</p> <p>As described above, the scheme is considered to be an NSIP.</p> <p>The Infrastructure Planning (Environmental Impact Assessment) Regulations 2009 (as amended) – These regulations are in accordance with the Planning Act 2008 and impose various procedural requirements, in particular the carrying out of an EIA in relation to applications for development consent and subsequent consent.</p>

National policy

- 4.1.2. Policy at the national level for each environmental topic is set out in the National Planning Policy Framework (NPPF), National Planning Practice Guidance (NPPG), and the National Policy Statement for National Networks (NPSNN). A summary of each is given below, and Table 4.2 provides a summary of the guidance relevant to each environmental topic contained within the documents.

National Planning Policy Framework and National Planning Practice Guidance

4.1.3. The National Planning Policy Framework (NPPF) and guidance within the National Planning Practice Guidance (NPPG) forms the national planning policy guidance. The NPPF was published in March 2012 and sets out the Government's planning policies for England and how these are expected to be applied. The framework acts as guidance for local planning authorities and decision-makers, both in drawing up plans and making decisions about planning applications. Subsequent to this, the NPPG was launched in March 2014 and brings together planning guidance on various topics into one place. Listed below (Table 4.2) are the policies from the NPPF of relevance to each environmental topic.

National Policy Statement for National Networks

4.1.4. There are no specific policies for nationally significant infrastructure projects in the NPPF. Instead, the Government determines these in accordance with the Planning Act 2008 and relevant National Policy Statements (NPSs) for major infrastructure, as well as any other matters that are considered both important and relevant. Policies within the National Policy Statement for National Networks (NPSNN) are particularly relevant for schemes promoted as a Nationally Significant Infrastructure Project (NSIP), requiring an application for a Development Consent Order (DCO).

Table 4.2: National Policy

Topic	Relevant National Policies
Air Quality and Greenhouse Gases	<p>NPPF</p> <p>Compliance with EU limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas (AQMA) and the cumulative impacts on air quality from individual sites in local areas is a requirement. Developments which contribute to, or put at an unacceptable risk from, unacceptable levels of air pollution should be prevented.</p>
	<p>NPSNN</p> <p>Where (after considering mitigation) a project would lead to a significant air quality impact in relation to EIA and/or lead to deterioration in air quality in a zone / Agglomeration, substantial air quality considerations should be given. The Secretary of State should refuse consent where, after taking into account mitigation, the air quality impacts of the scheme will either result in a zone / Agglomeration which is currently reported as being compliant with the Air Quality Directive becoming non-compliant, or affect the ability of a non-compliant area to achieve compliance.</p>
Cultural Heritage	<p>NPPF</p> <p>Significant weight should be given to the conservation of heritage assets, and where development will lead to less-than-substantial harm to the significance of a designated heritage asset, the harm should be weighed against the public benefits of the proposal. Refusal of consent is required when a scheme would result in the substantial harm or total loss of significance of a designated heritage asset, unless substantial public benefits outweigh that harm or loss.</p>
	<p>NPSNN</p> <p>The Secretary of State should identify and assess the particular significance of any heritage asset that may be affected by a development, whilst the significance of the heritage asset and value they hold now and in the future should also be considered. Substantial harm to or loss of designated assets of the highest significance should be wholly exceptional. Where a proposed development would lead to the substantial harm or total loss of significance of a heritage asset, the Secretary of State should refuse consent unless it can be demonstrated that substantial public benefits outweigh the loss or harm.</p>

Topic	Relevant National Policies
Landscape	<p>NPPF</p> <p>The planning system should contribute to and enhance the natural and local environment by protecting and enhancing valued landscapes, geological conservation interest and soils, whilst decisions should encourage the effective use of land by re-using land which has been previously developed.</p> <hr/> <p>NPSNN</p> <p>The scheme assessment should consider any relevant national and local development policy, significant effects during construction and operation, and visibility and conspicuousness. Compliance with the respective duties in section 11A of the National Parks and Access to Countryside Act 1949 and section 85 of the Countryside and Rights of Way Act 2000 is required. Local designations should be given consideration in decision making by the Secretary of State, and the Secretary of State will judge whether visual effects on sensitive receptors outweigh the benefits of the development.</p>
Nature Conservation and Biodiversity	<p>NPPF</p> <p>Paragraph 118 states that if significant harm (to biodiversity) cannot be avoided, adequately mitigated, or (as a last resort) compensated then consent should be refused. Consent should also be refused if irreplaceable habitats such as ancient woodland and/or veteran trees are lost or deteriorate in quality as a result of the scheme, unless the need for and benefits of the development clearly outweigh the loss. Additionally, where a project would be likely to adversely affect a SSSI, the development would not ordinarily be permitted, unless the benefits of the development clearly outweigh impacts on the features of the qualifying features of the SSSI. Projects on land within or outside an ecological designation, but likely to have an adverse effect upon the site are not favoured.</p> <hr/> <p>NPSNN</p> <p>The applicant should show how the project has taken advantage of opportunities to conserve and enhance biodiversity conservation interests, including appropriate mitigation measures. Prior to granting Development Consent, the Secretary of State must, under the Habitats Regulations, consider whether the project would be likely to have a significant effect on the objectives of a European site, or on any site to which the same protection.</p>
Noise and Vibration	<p>NPPF</p> <p>Paragraph 123 requires projects to avoid noise giving rise to significant adverse impacts on health and quality of life, to mitigate and reduce to a minimum other adverse impacts on health and quality of life arising from noise, and to identify and protect areas of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason. Developments which contribute to unacceptable levels or place unacceptable risk of adverse effects from noise pollution should be prevented.</p> <hr/> <p>NPSNN</p> <p>Developments are to be undertaken in accordance with the statutory requirements for noise. Applicants should ensure that the development avoids significant adverse noise impacts on health and quality of life, and mitigates/minimises other adverse impacts on health and quality of life from noise, and contributes to improvements to health and quality of life through effective management and control of noise. For most national network projects, the relevant Noise Insulation Regulations will apply.</p>
Road Drainage and the Water Environment	<p>NPPF</p> <p>Inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk, but where development is necessary, a Flood Risk Assessment (FRA) should support the proposal. The planning system should contribute to and enhance the natural and local environment by preventing both new and existing development from contributing to or being adversely affected by unacceptable levels of water pollution.</p> <hr/> <p>NPSNN</p> <p>Applications for schemes in Flood Zones 2 and 3 should be accompanied by a FRA. In addition, applications for schemes that are located within Flood Zone 1 and are 1 hectare in area or greater, or subject to other sources of flooding (local watercourses, surface water, groundwater or reservoirs), or where the Environment Agency has notified the local planning authority that there are critical drainage problems, should also be accompanied by an FRA. For projects which may be affected by, or may add to flood risk, sufficiently early pre-application discussions should be sought between the applicant and the Environment Agency, and, where relevant, other flood risk management bodies. Surface water flood issues also need to be understood and then taken account of.</p>

Topic	Relevant National Policies
People and Communities	<p>NPPF</p> <p>The government is committed to ensuring that the planning system does everything it can to support sustainable economic growth. Planning decisions should guard against the unnecessary loss of valued facilities and services, particularly where this would reduce the community's ability to meet its day- to- day needs, whilst protection and enhancement of Public Rights-of-way (PRoW) and access and seeking opportunities to provide better facilities for users, for example by adding links to existing rights-of-way networks should be sought by the applicant.</p> <hr/> <p>NPSNN</p> <p>For the development of the national road networks to be sustainable, they should be designed to minimise social and environmental impacts to improve quality of life. Evidence should be provided by applicants, demonstrating that reasonable opportunities have been considered to deliver environmental and social benefits as part of schemes. Existing open space should not be developed unless the land is surplus to requirements or the loss would be replaced by equivalent or better provision in terms of quantity and quality in a suitable location. PRoWs, National Trails, and other rights of access to land (eg open access land) are important recreational facilities for walkers, cyclists and equestrians. Applicants should consider appropriate mitigation measures to address adverse effects on coastal access, National Trails, other PRoWs and open access land and, where appropriate, to consider what opportunities there may be to improve access.</p>
Geology, Soils and Materials	<p>NPPF</p> <p>The planning system should contribute to and enhance the natural and local environment by protecting and enhancing valued landscapes, geological conservation interest and soils, whilst local planning authorities should consider the benefits (such as economic) of the best and most versatile (BMV) land. Where significant development is demonstrated to be necessary, local planning authorities should seek to use areas of poorer quality land in preference to that of higher quality.</p> <hr/> <p>NPSNN</p> <p>Where necessary, land stability should be considered in respect of new development, as set out in the NPPF and supporting planning guidance. Specifically, proposals should be appropriate for the location, including preventing unacceptable risks from land instability. The decision-maker should take into account the economic and other benefits of the best and most versatile agricultural land.</p>

Road Investment Strategy and Highways England Strategic Business Plan

- 4.1.5. In addition to the above national guidance documents, the *Road Investment Strategy: for the 2015/16-2019/20 Period* (Department for Transport, December 2014, updated March 2015), outlines a long-term programme to improve England's motorways and major roads - (the 'Strategic Road Network' (SRN)). The *Road Investment Strategy* comprises:
- A long-term vision for England's motorways and major roads, outlining how the Department for Transport will create smooth, smart and sustainable roads
 - A multi-year investment plan that will be used to improve the network and create better roads for users
 - High-level objectives for the first roads period 2015 to 2020
- 4.1.6. There is substantial provision within the Road Investment Strategy (RIS) to ensure that the programme of investment is delivered in a way that reduces impact on the environment.
- 4.1.7. Highways England's Strategic Business Plan (www.gov.uk/government/publications/highways-england-strategic-business-plan-2015-to-2020) sets out how Highways England will deliver the

Government's RIS over the coming road investment period. One of the key objectives of the Strategic Business Plan is for an 'improved environment'. With this in mind, Highways England has created a series of ring-fenced funds, to address a range of specific issues over and above the traditional focus of road investment. These funds allow for actions beyond business-as-usual and will help Highways England invest in retrofitting measures to improve the existing road network as well as maximising the opportunities offered by new road schemes to deliver additional improvements at the same time. Those of relevance to the scheme include:

- A £300 million Environment Fund to deliver specific enhancements to the network. This will enable Highways England to deliver the improved environmental outcomes. In particular, the fund will be used to mitigate the worst impacts of noise on those living close to the network, support the transition to low-carbon road transport, improve local water quality and resilience to flooding, maintain an attractive landscape, and work to halt the loss of biodiversity.
- A £250 million Cycling, Safety and Integration Fund to help deliver improvements in these areas through both bespoke interventions, as well as enhancements to new and existing schemes. This includes investing £100 million to improve cycling provision on at least 200 sections of the strategic road network, as well as ensuring all new schemes are cycle-proofed. Another £105 million will be spent on additional measures to boost safety that extend beyond the high safety standards already in place.

- 4.1.8. Highways England has also stated that the SRN must be easier to get over, under or around to ensure that roads serve communities instead of severing them. Around £45 million of the Cycling, Safety and Innovation fund is therefore dedicated to improving all elements of integration.

4.2. Local policy

- 4.2.1. Local planning and land-use policy of relevance to the scheme is outlined below.

Somerset County Council's Future Transport Plan 2011-2026

- 4.2.2. Somerset County Council's (SCC) Future Transport Plan sets out SCC's long-term strategy for getting the best from transport. The Future Transport Plan covers the period between 2011 and 2026 and replaces Somerset's Second Local Transport Plan, which finished in March 2011. Improvements to the A303 and A358 and the Henlade Bypass are identified as initiatives within Appendix B of the Future Transport Plan. The Future Transport Plan contains a schedule of policies that include the following:

- **SUS 1 Climate Change:** An annual action plan will be published explaining how SCC will lead Somerset's response to climate change
- **SUS 10 Landscape and Biodiversity:** Enhancing the landscape and biodiversity of the local area
- **ECN Sustainable Development:** Ensuring that sustainable development is at the forefront of thinking
- **SAF 1 Road Safety:** Improving the road safety around Somerset
- **HLT 3 Air Quality:** Minimising the effect any changes to Somerset's transport systems have on air pollution

South Somerset District Council Local Plan 2006-2028

4.2.3. The South Somerset District Council (SSDC) Local Plan 2006-2028 was adopted in 2015 and defines the spatial implications of economic, social and environmental change. The Local Plan includes a collection of policies which set out the long-term vision and strategic context for managing and accommodating growth within South Somerset. Policies based around environmental protection include the following:

- **Policy EQ1: Addressing Climate Change in South Somerset** – The Council will support proposals for new development where they have demonstrated how climate change mitigation and adaptation will be delivered, through the inclusion of a number of measures.
- **Policy EQ2: General Development** – Development will be designed to achieve a high quality, which promotes South Somerset's local distinctiveness and preserves or enhances the character and appearance of the district.
- **Policy EQ3: Historic Environment** – Heritage assets will be conserved and where appropriate enhanced for their historic significance and important contribution to local distinctiveness, character and sense of place.
- **Policy EQ4: Biodiversity** – All proposals for development, including those which would affect sites of regional and local biodiversity, nationally and internationally protected sites of geological interest will:
 - Protect the biodiversity value of land and buildings and minimise fragmentation of habitats and promote coherent ecological networks
 - Maximise opportunities for restoration, enhancement and connection of natural habitats
 - Incorporate beneficial biodiversity conservation features where appropriate
 - Protect and assist recovery of identified priority species
 - Ensure that Habitat Features, Priority Habitats and Geological Features that are used by bats and other wildlife are protected and that the design including proposals for lighting does not cause severance or is a barrier to movement

- **Policy EQ5: Green Infrastructure** – Development proposals should provide and/or maintain a network of connected and multifunctional open spaces that meet particular policy requirements.
- **Policy EQ6: Woodland and Forests** – The loss of ancient woodland as well as ancient or veteran trees should be protected against loss wherever possible.
- **Policy EQ7: Pollution Control** - Development that, on its own or cumulatively, would result in air, light, noise, water quality or other environmental pollution or harm to amenity, health or safety will only be permitted if the potential adverse effects would be mitigated to an acceptable level by other environmental controls, or by measures included in the proposals.

4.2.4. A major part of the local plan is the identification of broad locations for employment and housing growth and accompanying policies for assessing development proposals, taking account of the Government's NPPF and the NPPG. Land has been set aside for three employment development sites at Ilminster comprising: Local Plan site ME/ILMI/3 (Application 09/04401/FUL gives approval for half of the site for a Highways England maintenance depot, whilst a caravan business has been approved for part of the site); site ME/ILMI/4 [the proposed development has outline approval (09/00051/OUT) for 16.7 hectares of employment land (B uses) that was permitted subject to Section 106 agreements in 2010] and site ME/ILMI/5 proposes 5.1 hectares of land to be allocated as employment land (B1, B2 and B8 uses).

4.2.5. These development sites are covered by Policy SS3 Delivering New Employment Land and Policy EP1 Strategic Employment Sites. Ilminster is also recognised as a development area within the Local Plan (covered by Policy SS1 Settlement Strategy, Policy SS3 Delivering New Employment Land and Policy SS5 Delivering New Housing Growth), with the strategy for direction of growth (Policy SS34 Delivering New Employment Land, Policy SS5 Delivering New Housing Growth and Policy PMT3 Ilminster Direction of Growth) to the south west of the town. No further development land has been allocated within the Local Plan between Ilminster and Hatch Beauchamp.

South Somerset District Council Housing and Economic Land Availability Assessment, February 2017

4.2.6. The Housing and Economic Land Availability Assessment (HELAA) Report collates important information related to future housing and employment land delivery in South Somerset. This report updates the Strategic Housing Land Availability Assessment 2013 (South Somerset District Council, 2013) and part of the Employment Land Review 2009-10 to support the production of the Early Review of the Local Plan and the Council's 5-year housing supply. Numerous potential housing and employment sites have been identified in the HELAA. The following development proposals referenced in the HELAA fall within 1.2 miles (2 kilometres) of the scheme options and are therefore eligible to be considered as part of a combined and cumulative Environmental Assessment:

- W/ASH/0001
- W/ILMI/0019
- W/ILMI/0021
- W/ILMI/0301
- W/ILMI/0504

4.2.7. The combined and cumulative environmental assessment, referred within Section 4.2.6, will be updated and refined as part of the overall development of the scheme. The base data is reviewed every 2 years and the environmental assessment is again updated should that base data have changed in the intervening period.

Taunton Deane Borough Council Adopted Core Strategy 2011- 2028

4.2.8. The Adopted Core Strategy for Taunton Deane Borough Council (TDBC) was adopted in 2012 and sets out their long-term strategy with regard for development over the next 15 years. The Core Strategy along with the Taunton Town Centre Action Plan (2008) have replaced the majority of policies within the Taunton Deane Local Plan, which previously provided a comprehensive planning basis for development related decisions until 2011. The status of Local Plan policies is set out in Appendix 1 of the Adopted Core Strategy. The Core Strategy also includes a collection of policies which set out TDBC's long-term strategy for development until 2028. Policies based around environmental protection include the following:

- **Policy 3.1 Presumption in Favour of Sustainable Development –**
TDBC will take a positive approach that reflects the presumption in favour of sustainable development contained in the NPPF, to ensure that proposals secure development that improves economic, social and environmental conditions in the area.

-
- **Policy 3.2 Climate Change** – Development proposals should result in a sustainable environment, and will be required to demonstrate that the issue of climate change has been addressed by a number of factors.
 - **Policy 3.9 Environment** – The Council is committed to conserving and enhancing the natural and historic environment and will not support proposals which will have an adverse impact on a Natura 2000 and/or Ramsar site. Developments will be permitted that:
 - Are in accordance with national, regional and local policies for development within rural areas (including those for protected Natura 2000 and Ramsar sites)
 - Are appropriate in terms of scale, siting and design
 - Protect, conserve or enhance landscape and townscape character whilst maintaining green wedges and open breaks between settlements
 - Protect, conserve or enhance the interests of natural and historic assets
 - Do not exacerbate, and where possible improve the quality, quantity and availability of the water resource, and reduce flood risk (fluvial and surface water)
 - Protect habitats and species, including those listed in UK and Local Biodiversity Action Plans, and conserve and expand the biodiversity of the Plan Area
 - Provide for any necessary mitigation measures
 - **Policy 6.1 General Requirements:** Additional road traffic arising, will not lead to environmental degradation by fumes, noise vibration or visual impact. Proposals will not lead to harm to protected species or their habitats. The appearance and character of any affected landscape, settlement, building or street scene will not be unacceptably harmed by the development. Potential air pollution, water pollution, noise, dust, lighting, glare, heat, vibration and other forms of pollution or nuisance will not unacceptably harm public health or safety or the amenity of dwelling or other elements of the local or wider environment.
 - **Policy 6.2 Development in the Countryside:** Developments outside of defined settlement limits will be supported when there is an identified local need, class B Business use in appropriate locations as well as various other criteria relating to holiday and tourism, agriculture and forestry, replacement dwellings, affordable housing, conversion of existing buildings and essential utilities infrastructure.

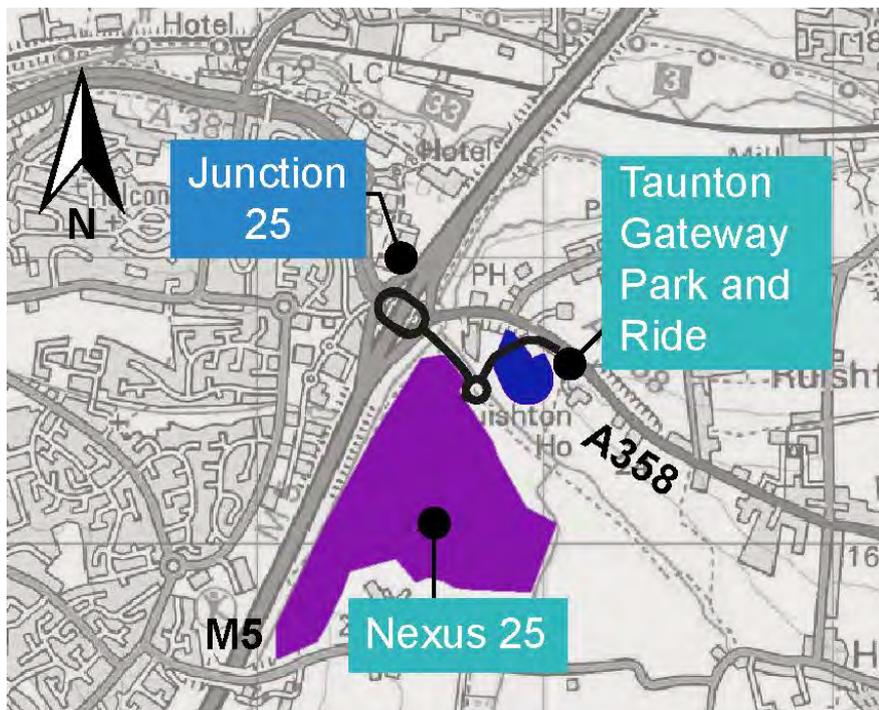
Taunton Deane Borough Council Site Allocations and Development Management Plan 2016

4.2.9. In 2016 Taunton Dean Borough Council produced a Site Allocations and Development Management Plan (SADMP), which sets out more detailed site allocations to meet land requirements up to 2028 and also includes specific, detailed development management policies. The SADMP identifies a number of housing sites but none of these fall within the criteria for consideration within the combined and cumulative assessment as part of an Environmental Assessment Report. However, notable developments within the SADMP include Comeytrove/Trull (Spatial Policy Ref TAU1) which proposes 2,000 dwellings, and Staplegrove (Spatial Policy Ref TAU2) which proposes around 1,500 dwellings.

Taunton Deane Borough Council Local Development Order for Nexus 25 development

4.2.10. As part of the Taunton Deane Borough Council Site Allocations and Development Management Plan, a major development at M5 junction 25 has been proposed and is the subject of a Local Development Order. The development will cover approximately 25 hectares and will be located on the southwest side of M5 junction 25, as shown in Figure 4.1 below. The existing Park-and-Ride site is located to the east of the connection to the new A358 (the Pink and Blue options) shown in blue.

Figure 4.1: Nexus 25 location and site boundary



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- 4.2.11. Nexus 25 is intended to provide up to 4,000 jobs once fully occupied, with construction commencing in approximately 2020.
- 4.2.12. As part of the Nexus 25 development, SCC intend to construct a new roundabout and dual carriageway link from the entrance to the site to M5 junction 25, together with amendments to the layout of junction 25 and the access arrangements for the adjacent Park-and-Ride and the existing A358 to Henlade. A new pedestrian and cycleway bridge connecting the development to south Taunton is also proposed.

Taunton Deane Borough Council Strategic Housing Land Availability Assessment (2017)

- 4.2.13. Taunton Deane Borough Council Strategic Housing Land Availability Assessment (SHLAA) (2017) provides a snapshot of deliverable and developable housing plots in Taunton Deane Borough Council, identifying the supply of housing to come forward in the next 5-years and the stock of longer term development opportunities. Notable deliverable sites over the next 5-years include: 200 dwellings at Killams Drive (planning ref: 38/12/0203oa, 38/15/0177) which is currently under construction and 2 separate planning applications at Monckton Heathfield; 48/05/0072oa: Monckton Heathfield Urban Extension for 176 dwellings and 48/13/0008oa: Hatnells Farm, Monckton Heathfield for 200 homes. Other key deliverable site opportunities include: Comeytrove Urban Extension, Taunton (42/14/0069) for 2,000 homes in total; Land between Langellar and Walford Cross, Monckton Heathfield (Core Strategy Policy TAUN001) for 2,235 dwellings; Site Allocation and Development Management Plan Policy TAUN011 Staplegrove East, Taunton (planning ref: 34/16/0014a) for 915 homes and Staplegrove West, Taunton (planning ref: 34/16/0007oa) for 713 dwellings.

5. Description of route options

5.1. Introduction

5.1.1. This section provides the following:

- A description of the main geometric design parameters that were considered as a part of the initial route development and how the 28 route options and variants were identified as a part of this process
- A brief non-technical description of each of the route options and variants
- How the options identified were identified and assessed during the sifting process.

5.2. Options Identification

Geometric design parameters

Horizontal alignment

5.2.1. For the purposes of option identification process, the horizontal alignment design was constrained as follows:

- At the western tie-in, various options were investigated for the connection to the M5 motorway. These options either involved:
 - New junctions to the north or south of M5 junction 25 which would be either free-flowing or elevated roundabouts with grade-separated slip roads
 - A new connection at M5 junction 25 which would effectively comprise an upgrade of the existing junction, or a direct connection to junction 25
 - A hybrid connection consisting of south-facing slip roads on the M5 and a spur leading to a direct connection to junction 25. A south-facing slip road junction is a limited-movement junction, where traffic would only be able to join the M5 from the new A358 to travel south on the motorway; and conversely, could only join the A358 when travelling north and leaving the M5.
- At the eastern tie-in, the limit of the scheme was assumed to be the point at which the Ilminster Bypass (a wide single carriageway with alternating 2+1 lane configuration) passes under the B3168 underbridge, approximately 1.5 miles (2.5 kilometres) east of the existing Southfields Roundabout.
- Within the scheme limits, each option was developed with the intention of following a corridor that was either entirely or partially different from other options. Properties such as residential buildings, commercial and farm buildings were avoided where possible, as were the known environmental constraints.

- The horizontal alignment was designed to the geometric standards within the Design Manual for Roads and Bridges (DMRB), the design standard for trunk roads and motorways in the United Kingdom. Permitted relaxations were employed where necessary, although care was taken to ensure that these relaxations were not at risk of becoming departures as the scheme developed.

5.2.2. Where offline routes⁴ were plotted, the objective was generally to provide a high speed direct connection with a high quality geometric alignment. It was considered that this would provide a useful comparison against online sections⁵ which may have comprised a lower quality alignment although would incur less expense and environmental impact.

Vertical alignment

5.2.3. An outline vertical alignment was also produced relative to the existing ground profile to gain an indication of how each option generated might integrate into the existing landscape. Each alignment was entirely compliant with geometric standards; however, at the time, the vertical alignment was a work in progress and subject to limitations such as:

- Flood levels: it was observed that the vertical alignment of some routes would need to be reviewed to ensure they were clear of flood levels.
- Environmental mitigation: although environmental constraints were avoided where possible, this was not always achievable. For example, mitigation of the visual impact resulting from the proposed route being near or above existing ground level was not fully considered at this early stage. Therefore, although the centreline of a route may have avoided environmental constraints and property, when the full earthworks outline is considered there might be an impact on the environmental constraints and property.
- Earthworks balance: generally, the amount of material excavated from cuttings should be reused in the construction of embankments and ideally should be in balance, with no material required to be brought in and no material taken away for disposal during the construction. However, the majority of options would produce an earthworks surplus. Improvements to address the earthworks balance would be considered in later stages of the scheme development once the preferred option is identified.

⁴ Offline routes are those options that predominantly avoid the current alignment of A358

⁵ An online route is a road which follows the line of an existing road.

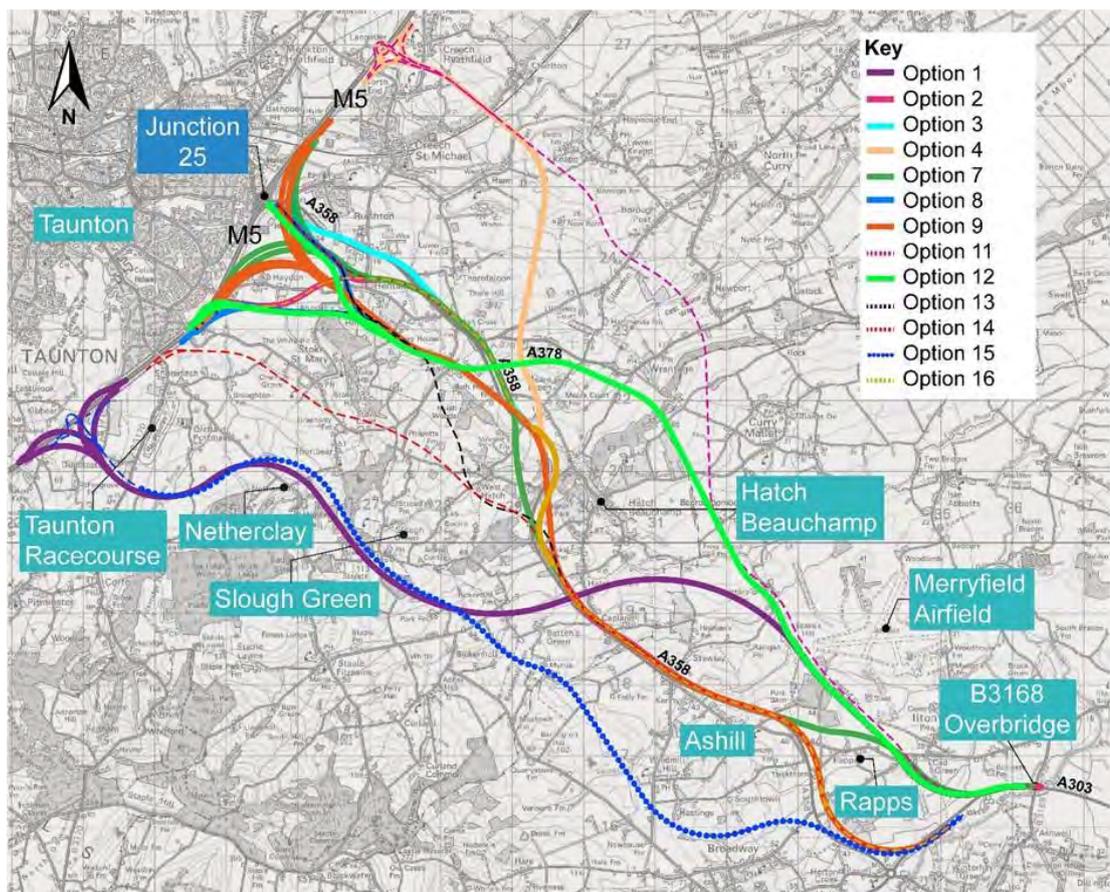
5.3. Development of route options

5.3.1. During the initial route identification exercise, a total of 16 routes were developed. Each was intended to enable investigation of a specific route corridor and were split broadly into 3 main sections:

- route options passing to the north of the current alignment of A358
- routes passing approximately along the current route of A358
- routes passing to the south of the current alignment of A358.

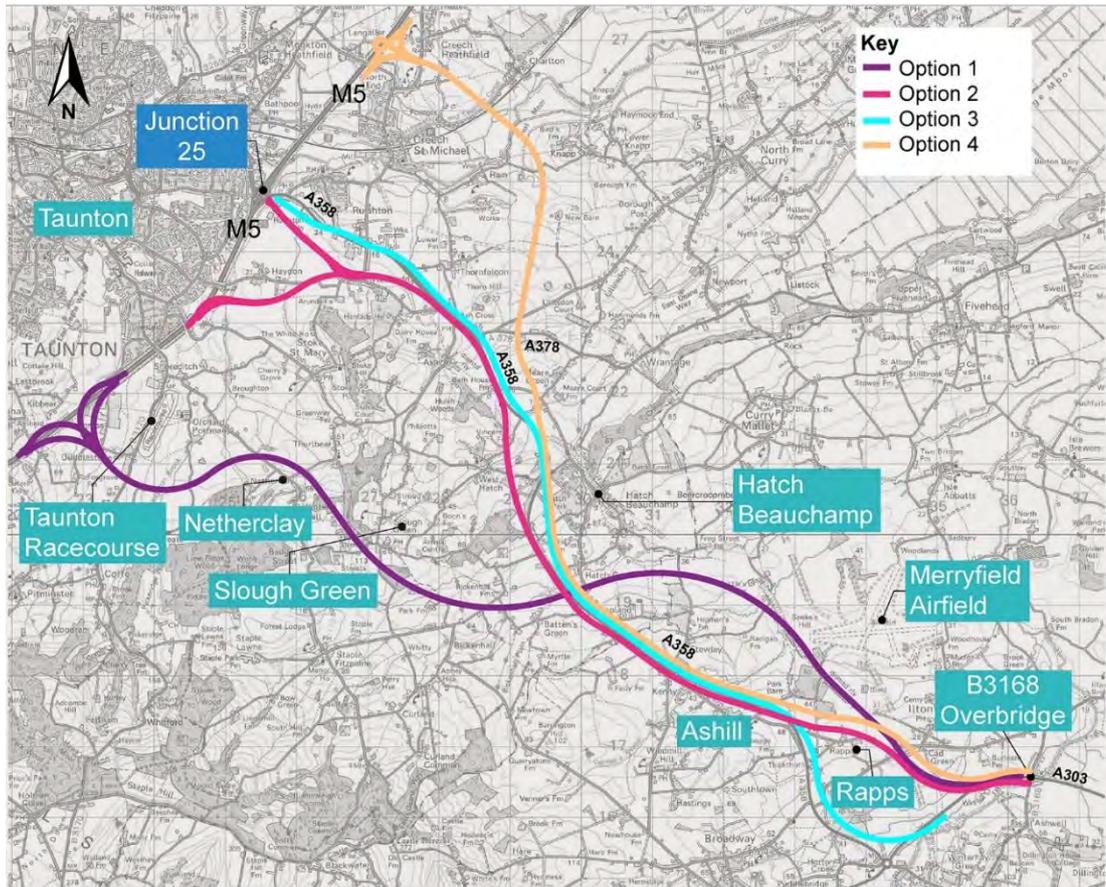
5.3.2. Each option was numbered from 1 to 16 and these options, with the exception of Options 5, 6, and 10, are illustrated in Figure 5.1. The unique aspects of each route option are listed in Table 5.1. Due to the overlapping nature of the routes, some options are partially obscured in Figure 5.1 and are therefore shown in greater clarity in Figure 5.2, Figure 5.3 and Figure 5.4. See the separate routes in Section 5.4, 5.5, 5.6 for more detail.

Figure 5.1: Routes considered as a part of the options identification stage



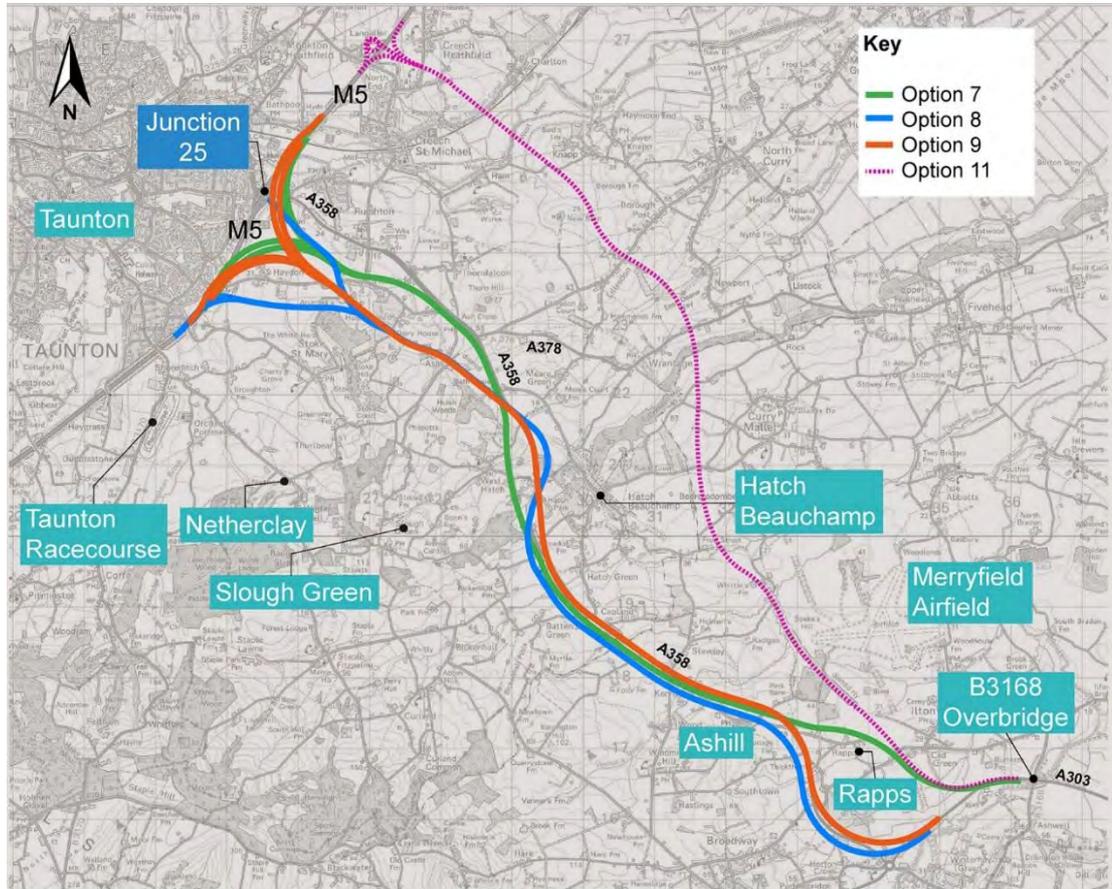
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Figure 5.2: Routes considered as a part of the options identification stage (options 1 to 4)



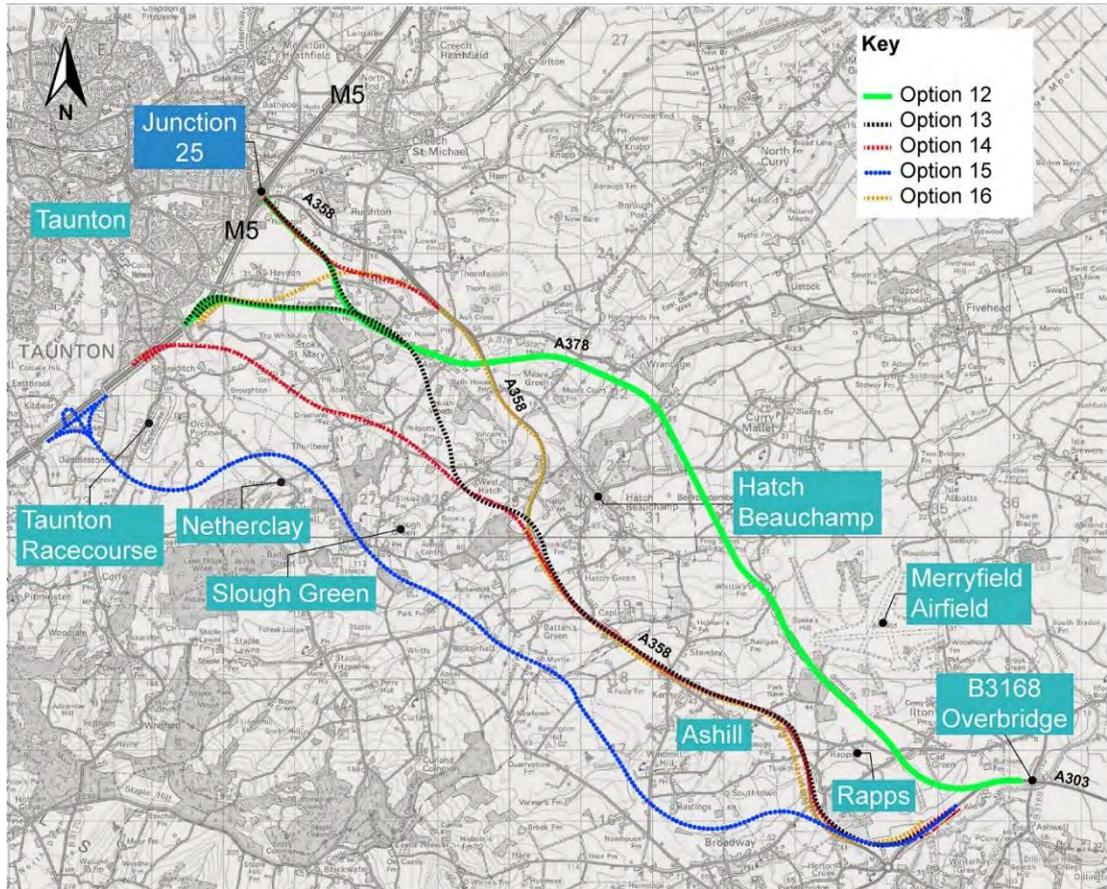
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Figure 5.3: Routes considered as a part of the options identification stage (options 7 to 11)



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Figure 5.4: Routes considered as a part of the options identification stage (options 12 to 16)



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Table 5.1: Unique aspects of the initial 16 route options

Option	Objective
1	To explore an entirely offline corridor
2	To retain consideration of an element of the 2007 scheme – a section of retained cutting through Stoke Road, Henlade.
3	To address the perception that an online solution might be the least expensive and incur the least environmental impact
4	To explore an offline corridor to the north
5	<i>Not sifted (see Sections 5.3.3 to 5.3.5)</i>
6	<i>Not sifted (see Sections 5.3.3 to 5.3.5)</i>
7	To consider the highest quality geometric alignment, including free flowing north and south facing slip roads at the M5
8	To determine if topography would be more favourable than for Option 2 and to maximise distance from the Air Quality Management Area at Henlade.
9	Similar to Option 8 but with a higher standard of junction with the M5.
10	<i>Not sifted (see Sections 5.3.3 to 5.3.5)</i>
11	To investigate an easterly corridor.
12	To investigate a corridor to the north of Hatch Beauchamp that then connects to the M5 in a similar manner to more central options
13	To investigate a corridor passing to the south of the village of West Hatch, but north of Stoke St Mary.
14	To investigate a corridor passing to the south of West Hatch and Stoke St Mary
15	To investigate a corridor to the south of the village of Ashill
16	To investigate what is considered to be the minimum RIS compliant solution, maximising online widening along the A358 and then providing only south facing links to the M5.

- 5.3.3. During the development of these options, minor variations to some of the routes were identified and were considered to warrant assessment. As such, these were included as variants to the numbered options, and were identified with alphabetic suffixes. Due to the length of the scheme, it was noted that a significant number of potential variants to each numbered route option were possible. However, a pragmatic cap on the number taken to assessment was imposed.
- 5.3.4. Following the process of including variants, it was noted that a number of duplicate or very similar options had arisen and some were removed (Options 5, 6 and 10). This rationalisation process resulted in a total of 28 options that were taken through to be sifted, presenting a sufficiently broad range of geographic routes to demonstrate a thorough search for the shortlist for consultation.
- 5.3.5. As a result of the rationalisation, however, there are gaps in the numbering of the options. In particular, numbered route Options 5, 6 and 10 were removed at this stage and not sifted.

Description of the route options

5.3.6. The route options identified are described in detail within the following subsections. For the purposes of this report they have been broadly classified as either northern, central or southern routes.

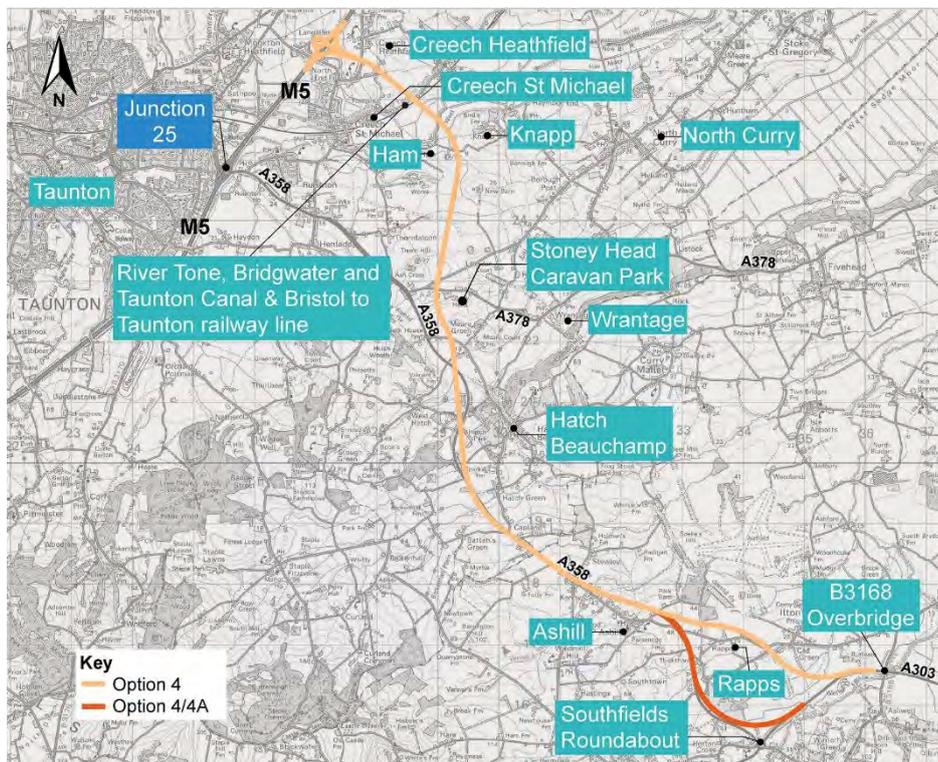
5.4. Northern routes in detail

5.4.1. Initially three northern routes were developed for consideration – Options 4, 11 and 12.

Option 4 and variant

5.4.2. Option 4 and its variant is presented in Figure 5.5 and are characterised by their proposed use of the existing A358 corridor between the villages of Ashill and Hatch Beauchamp. To the west of Hatch Beauchamp, the routes would leave the existing road and travel northwards, passing between the villages of Creech St Michael and North Curry, before connecting with the M5 approximately 1.8 miles (3 kilometres) north of junction 25.

Figure 5.5: Route Option 4 and its variant



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- 5.4.3. From the east, Option 4 ties into the A303 Ilminster Bypass at the B3168 overbridge. At this point the proposed route follows a direct offline alignment between the B3168 Overbridge and Ashill, to the north of Rapps. The route then follows the line of the existing A358 Ashill Bypass, the intention being that this would be a section of online widening until just south of Hatch Beauchamp as the existing road is of a relatively high standard of alignment and construction.
- 5.4.4. To the west of this location the A358 bypasses Hatch Beauchamp where the alignment of the existing road through this section has been assessed to be not to current standards for consideration as a two-lane dual carriageway. As such, the line of the proposed road has been designed to follow a compliant geometric alignment effectively cutting the corner of the existing bends and providing a high quality geometric solution.
- 5.4.5. The route then continues offline in a northerly direction to the west of Wrantage, crossing the A378 near Stoney Head Caravan Park and then passing between the villages of Ham and Knapp before turning north west to pass between Creech Heathfield and Creech St Michael. It would connect to the M5 at a new junction approximately 1.8 miles (3 kilometres) north of junction 25. This option would involve the route crossing over the River Tone, Bridgwater and Somerset Canal and the Bristol to Taunton railway line, all of which lie to the south east of Creech Heathfield and Creech St Michael.

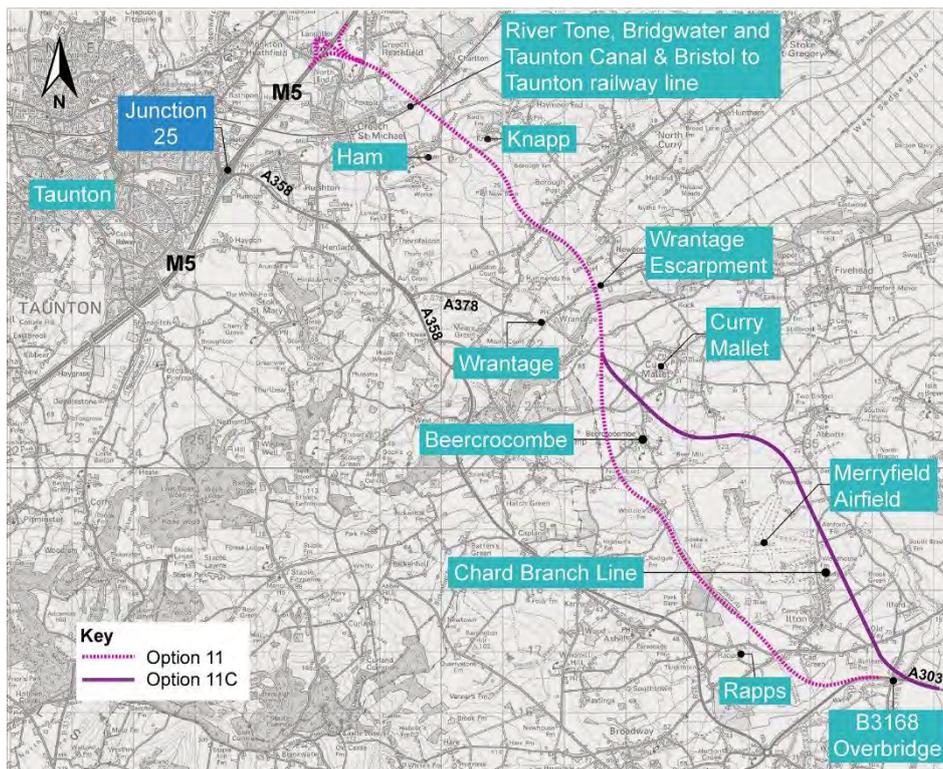
Option 4/4A

- 5.4.6. Option 4/4A follows an identical course to Option 4 for the majority of its length. However, towards its southern extents, this option would comprise a looped alignment taking it parallel to the existing A303 and A358, close to the existing Southfields Roundabout and to the south of the village of Rapps.

Option 11 and its variant

5.4.7. Option 11 and its variant were taken through the sifting process and are presented in Figure 5.6. They are characterised by the fact that they would occupy the most eastern corridor of all options considered, crossing the A378 just to the north east of the village of Wrantage. Options 11A & 11B variants were discarded at a very early stage and were not developed in any detail.

Figure 5.6: Route Option 11 and its variant



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Option 11

5.4.8. From the eastern tie-in at the B3168 overbridge, Option 11 leaves the existing A303 and initially follows the line of the redundant Chard branch line for 2.5 miles (4 kilometres), taking it to the west of Royal Naval Air Station (RNAS) Merryfield (formerly known as RAF Merryfield).

5.4.9. Where the route of the Chard branch line turns west into Hatch Beauchamp, the proposed road would continue in a northerly direction to the west of Beercrocombe and Curry Mallet and then cross the ridge known as Wrantage Escarpment.

5.4.10. At the foot of Wrantage Escarpment the route would then cross the A378 approximately 0.6 miles (1 kilometre) to the north east of Wrantage, and then bear westwards between the villages of Ham and Knapp to join the route of

Option 4 prior to the crossing of the Bridgwater and Taunton Canal, Bristol to Taunton Railway Line and the River Tone.

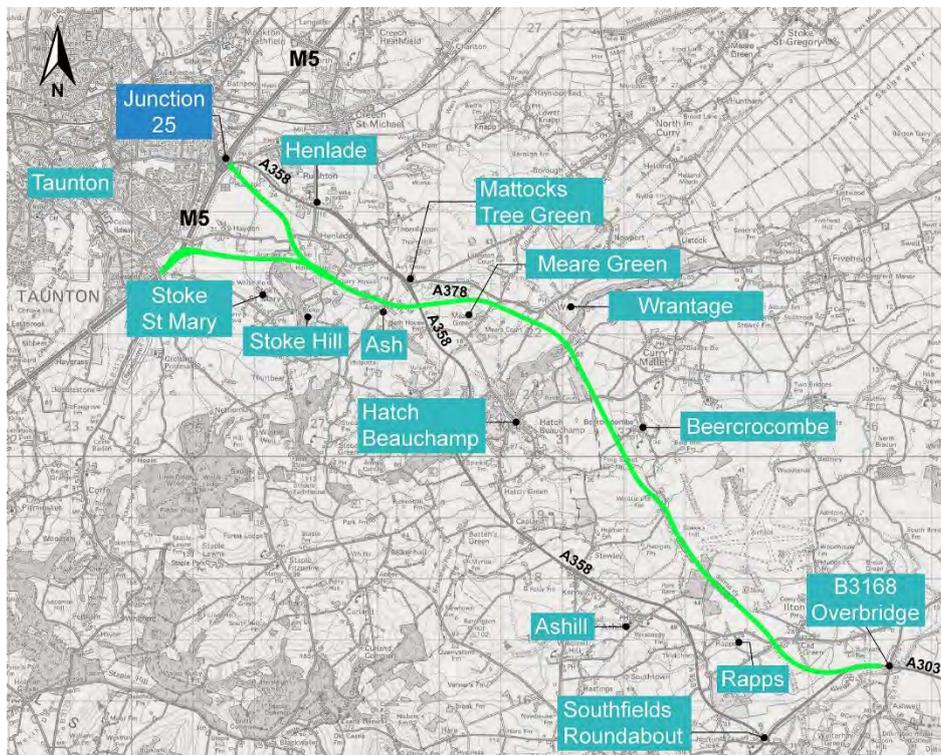
Option 11C

5.4.11. Option 11C would involve the most easterly extent of works of all the options. At the eastern tie-in with the A303 Ilminster Bypass the route would quickly turn northwards onto a course that would take it to the east of RNAS Merryfield. The route would then bear west to pass between Beercrocombe and Curry Mallet and then join the route of Option 11 prior to the crossing of Wrantage Escarpment. Option 11C would be identical to Option 11 from this point onwards.

Option 12

5.4.12. Only one variant of Option 12 was taken through the sifting process and is presented in Figure 5.7. The unique aspect of this option is, having taken a northerly route between the B3168 overbridge and Hatch Beauchamp, the route travels west to connect with the M5 motorway in a position similar to the central options.

Figure 5.7: Route Option 12



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5.4.13. Option 12 initially follows an identical route to Option 11 until just south west of Beercrocombe. At this point Option 12 turns westwards to pass just south of Wrantage and north of Meare Green. This option would not cross the A378 although it would come very close to it, eventually crossing over the A358 approximately 300 metres to the south of its junction with the A378 at Mattock's Tree Green. The route would then pass immediately to the north of the settlement of Ash and traverse the northern slope of Stoke Hill between Henlade and Stoke St Mary before dividing at a new junction. A spur would provide a link into Taunton and to the M5 north via junction 25, whilst a new junction on the M5 would provide a south-facing connection with the motorway.

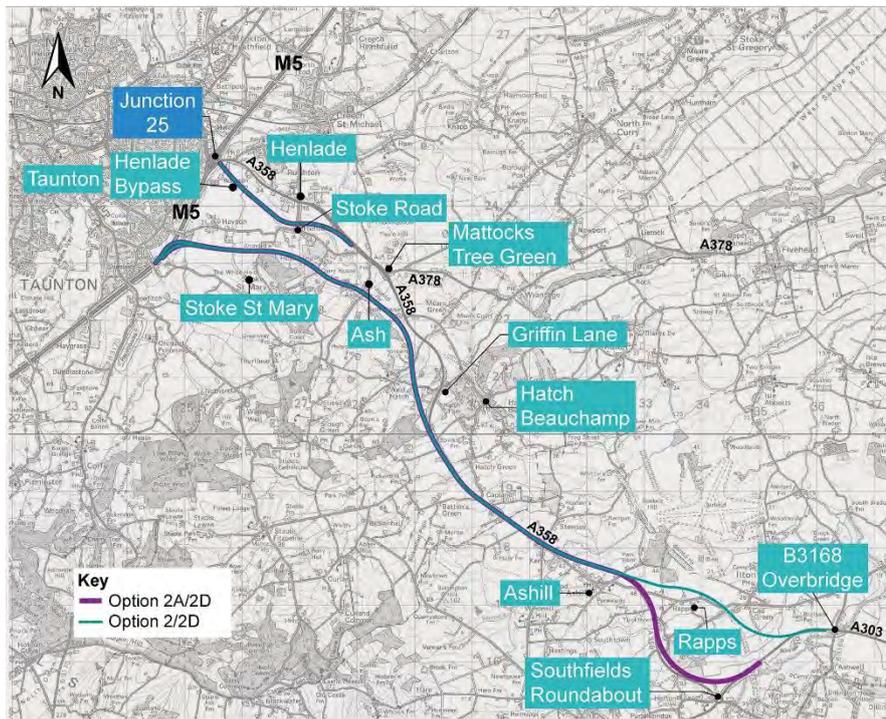
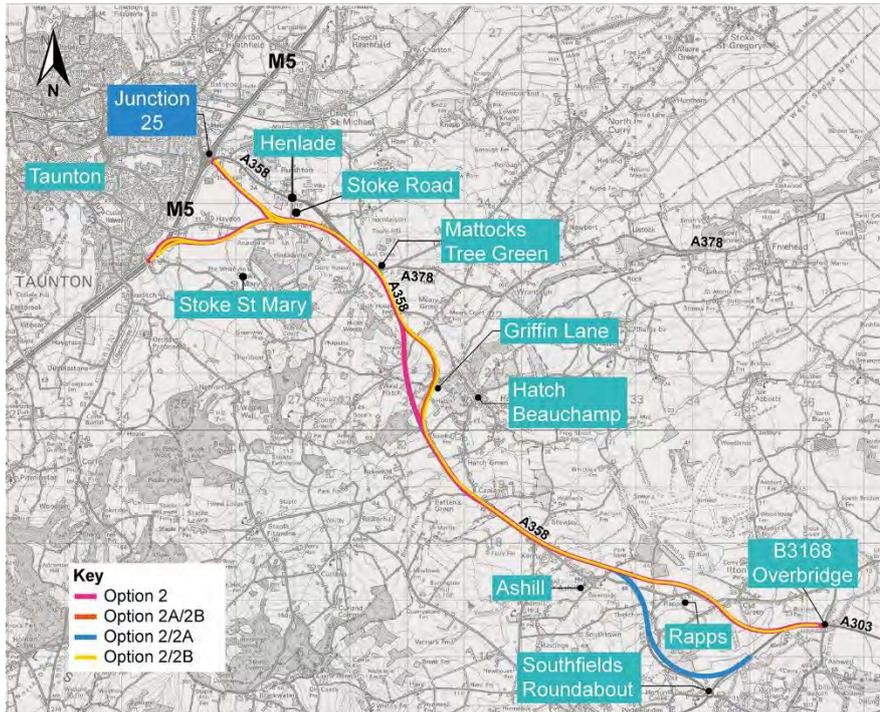
5.5. Central routes in detail

5.5.1. Initially seven central routes were developed, a common theme being that they all followed the existing A358 corridor for all or part of their length. These routes were Options 2, 3, 7, 8, 9, 13, and 16.

Option 2 and its variants

5.5.2. Option 2 and its variants are characterised by the corridor they take in the vicinity of the village of Henlade, approximately 0.9 miles (1.5 kilometre) to the east of M5 junction 25. The routes all pass through a gap in residential property along Stoke Road, in a retained cutting, and are presented in Figure 5.8.

Figure 5.8: Option 2 and its variants



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Option 2

- 5.5.3. At the eastern limits, Option 2 ties into the A303 Ilminster Bypass at the B3168 overbridge. At this point the existing A303 bears southwards, whilst the proposed route would follow a direct offline alignment between the B3168 overbridge and Ashill, to the north of the village of Rapps. The route then follows the line of the existing A358 Ashill Bypass, the intention being that this would be a section of online widening due to the fact that the existing road is of a relatively high standard of alignment and construction, until just south of Hatch Beauchamp.
- 5.5.4. To the west of this location, the existing A358 bypasses Hatch Beauchamp, and the alignment of this section has been assessed to be below current standards. As such, the line of the proposed road has been plotted in a compliant geometric alignment effectively cutting the corner of the existing bends and providing a high quality geometric solution.
- 5.5.5. Upon re-joining the existing A358 after the Hatch Beauchamp Bypass, the proposed road then follows the existing corridor closely, passing close to the junction with the A378 at Mattock's Tree Green, and continuing through the gap in Stoke Road at Henlade. Following this crossing, the route would divide at a new junction. A spur would provide a link into Taunton and to the M5 north via junction 25, whilst slip roads would provide a south facing connection with the motorway.

Option 2/2A

- 5.5.6. Option 2/2A would follow an identical course to Option 2 for most of its length. However, towards its southern limits this route would follow a looped alignment taking it parallel to the existing A303 and A358, close to the Southfields Roundabout and south of the village of Rapps.

Option 2/2B

- 5.5.7. Option 2/2B follows an identical course to Option 2 for most of its length. However, this option follows the corridor of Hatch Beauchamp Bypass in its entirety, including the below current standards alignment. This objective of this option would be to re-use elements of the bypass, including the existing Griffin Lane Underbridge, subject to technical approval.
- 5.5.8. Option 2/2B would be identical to Option 2 in all other respects.

Option 2A/2B

- 5.5.9. Option 2A/2B is a hybrid of Option 2 and the 2/2A, 2/2B variants, incorporating the southern loop of Option 2/2A and the incorporation of the Hatch Beauchamp Bypass corridor from Option 2/2B. In all other respects, this option is identical to Option 2.

Option 2D

- 5.5.10. The D variants of Option 2 were intended to investigate a key feature of the previous 2006-07 scheme – a retained cutting through a gap in residential property along Stoke Road, Henlade.

Option 2/2D

- 5.5.11. Option 2/2D is identical to Option 2 between Hatch Beauchamp and the tie-in with the A303 Ilminster Bypass. To the west of Hatch Beauchamp, the route avoids the alignment of Hatch Beauchamp Bypass (which is not to current standards), taking a more direct path to the north initially and then bearing westwards, leaving the existing A358 entirely, to pass just to the south of Ash and then around the northern edge of Stoke Hill. At this point, this option differs to Option 2 in that a junction and associated link to M5 junction 25 is not provided. Instead, the proposed road joins the M5 south at a junction with south facing slip roads only.
- 5.5.12. To address the lack of connection to M5 junction 25, this option incorporates a separate 'Henlade Bypass' which would ensure that traffic on its way to and from junction 25 is removed from the centre of Henlade. Two versions of this separate link have been considered during the assessment – a single carriageway link which would provide a similar level of service to the existing route (albeit removing the traffic from the village centre) and a dual carriageway version which would provide an increased level of service.

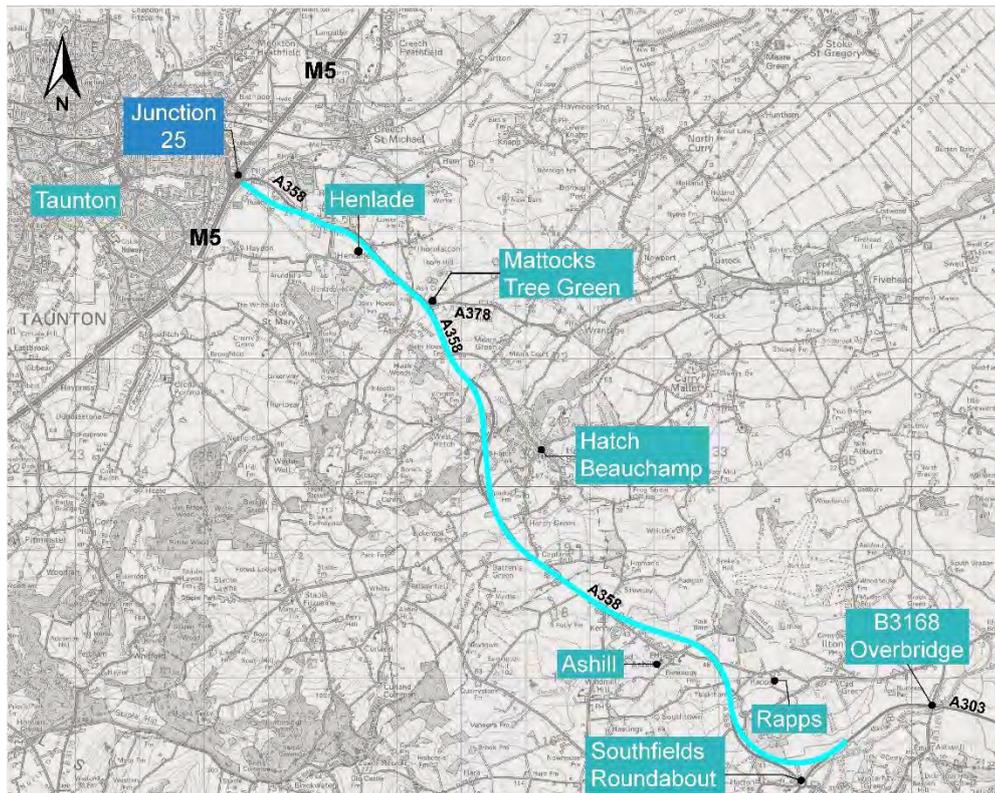
Option 2A/2D

- 5.5.13. Option 2A/2D is a hybrid of Option 2 in that it would incorporate the southern looped alignment of Option 2/2A (taking it south of the village of Rapps) and the 'Henlade Bypass' element of Option 2/2D. It would be identical to Option 2 in all other respects. As for Option 2/2D, a single carriageway version and a dual carriageway version of the Henlade Bypass have been considered for this option.

Option 3

5.5.14. Option 3 is presented in Figure 5.9. This option is intended to provide an indication of an online solution, (but not for its entirety). The looped section towards the southern tie-in with the A303 Ilminster Bypass is offline in order to achieve compliance with horizontal alignment standards as it swings northwards from the A303 corridor to the A358 corridor.

Figure 5.9: Route Option 3



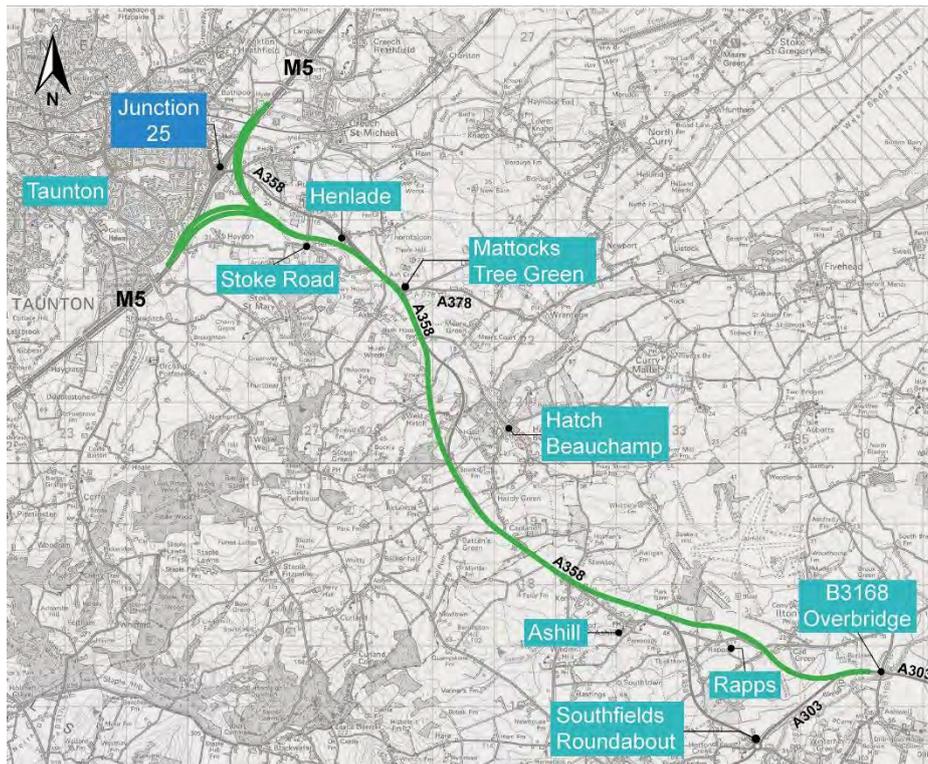
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- 5.5.15. Once on the alignment of the existing A358, the proposed road follows the route of the A358 Ashill Bypass, to the south of Hatch Beauchamp. At this point the proposed road would temporarily leave the existing road in order to provide a geometrically compliant alignment, effectively smoothing the curves of the Hatch Beauchamp Bypass.
- 5.5.16. Having rejoined the existing A358 corridor after the Hatch Beauchamp Bypass, the proposed road then follows the existing corridor through to connect directly to M5 junction 25. This part of the option highlights both the difficulties of providing a connection to the A378 at Mattock's Tree Green, as the existing A358 passes over a sharp summit at this location, and the complexity of widening the existing road through the village of Henlade, where residential development is situated along both sides of the road.

Option 7

5.5.17. Option 7 represented the highest quality alignment within the central corridor. Option 7 is presented in Figure 5.10 and is characterised by a comparatively straight route from the eastern tie-in at the B3168 overbridge through to Henlade, at which point free-flowing slip roads to the M5 north and south are proposed.

Figure 5.10: Route Option 7



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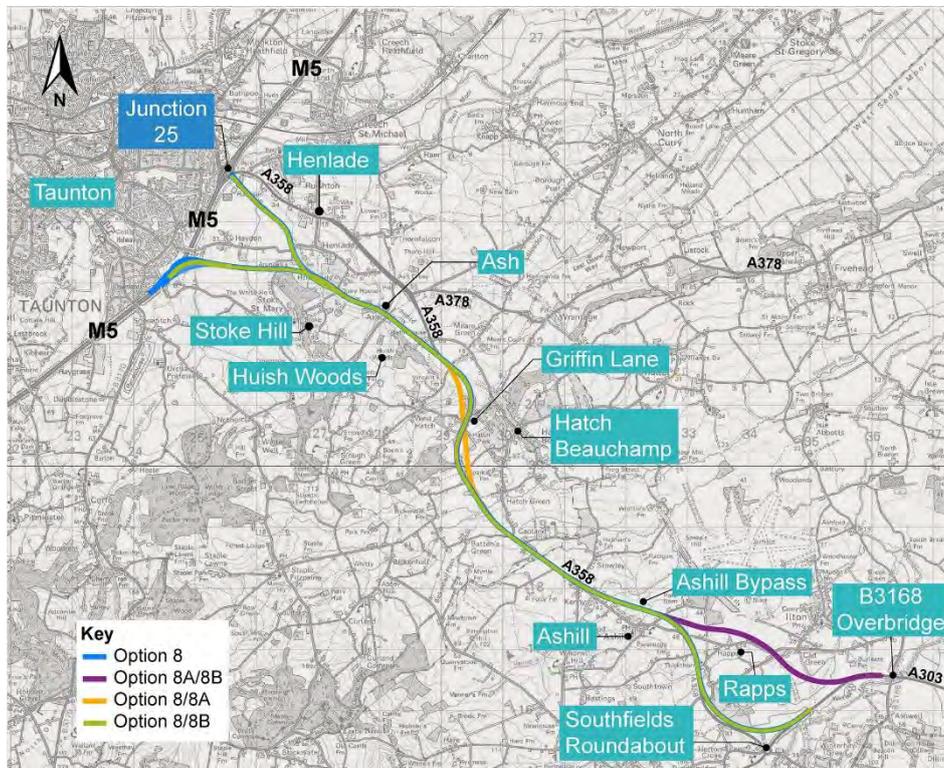
- 5.5.18. At the eastern tie-in, the existing A303 bears southwards, although the proposed route follows a direct offline alignment between the B3168 overbridge and Ashill, taking it to the north of the village of Rapps. The route then follows the line of the existing A358 Ashill Bypass, the intention being that this would be a section of online widening due to the fact that the existing road is of a relatively high standard of alignment and construction, until just south of Hatch Beauchamp.
- 5.5.19. At this point, the route moves offline taking a direct path in favour of following the horizontal alignment of the Hatch Beauchamp Bypass which is not to current standards. It then re-joins the existing A358 for 1.2 miles (2 kilometres), passing close to the signal-controlled junction with the A378 at Mattock's Tree Green, before passing through the gap between property along Stoke Road, Henlade.

5.5.20. After Henlade, a free-flowing all-movements junction would be provided, allowing traffic to travel to and from the M5 north and south. Although not shown, it is likely that connections would also be provided into Taunton via a connection to the existing A358 / M5 junction 25.

Option 8 and its variants

5.5.21. Option 8 and its variants are presented in Figure 5.11 and are very similar to Option 2 along much of their length. However, the intention behind Option 8 was to explore a more southerly corridor between Hatch Beauchamp and the M5, in order to determine if topography would be more favourable and also to increase distance from the Air Quality Management Area at Henlade.

Figure 5.11: Route Option 8 and its variants



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Option 8

5.5.22. At the southern limits, the proposed road route follows a looped alignment taking it parallel to the existing A303 and A358, close to the Southfields Roundabout and south of the village of Rapps. The proposed road then loops around to join the A358 Ashill Bypass, the intention being that this would be a section of online widening due to the fact that the existing road is of a relatively high standard of alignment and construction until just south of Hatch Beauchamp.

- 5.5.23. At this point the route would move offline taking a direct path in favour of following the horizontal alignment of the Hatch Beauchamp Bypass which is not to current standards. It would re-join the existing A358 briefly before following an offline corridor to the north of Huish Woods, south of Ash and around the northern slope of Stoke Hill.
- 5.5.24. After Stoke Hill the route would divide at a new junction. A spur would provide a link into Taunton and to the M5 north via junction 25, whilst slip roads would provide a south facing connection with the motorway.

Option 8/8A

- 5.5.25. Option 8/8A follows an identical course to Option 8 for the most of its length. However, this option follows the corridor of the Hatch Beauchamp Bypass in its entirety, including the alignment that is not to current standards. The objective of this option is to retain the opportunity of re-using elements of the bypass, including the existing Griffin Lane Underbridge, subject to Technical Approval.
- 5.5.26. Option 8/8A is identical to Option 8 in all other respects.

Option 8/8B

- 5.5.27. Option 8/8B follows an identical course to Option 8 for most of its length. However, at its southern limits this option follows a direct offline alignment between the B3168 overbridge and Ashill, to the north of the village of Rapps, rather than the looped alignment close to Southfields Roundabout.
- 5.5.28. This option is identical to Option 8 in all other respects.

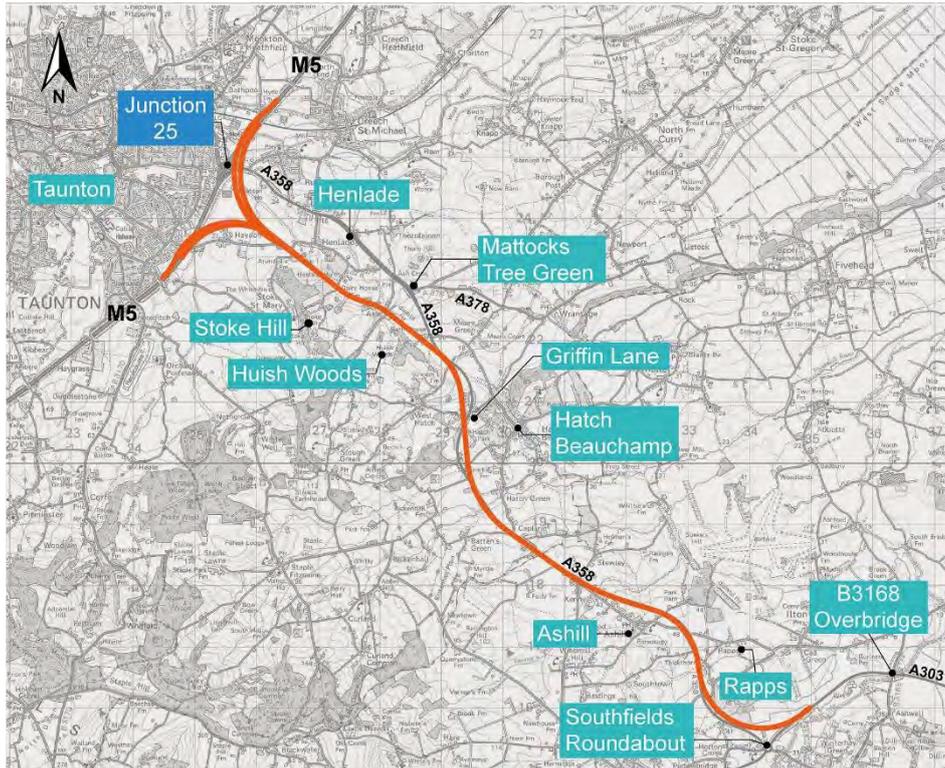
Option 8A/8B

- 5.5.29. Option 8A/8B is a hybrid of Option 8 incorporating the Hatch Beauchamp Bypass corridor from Option 8/8A and the offline section, north of Rapps, from Option 8/8B. In all other respects, this option is identical to Option 8.

Option 9

5.5.30. Option 9 is presented in Figure 5.12 and follows a similar offline corridor to Option 8 and its variants between Hatch Beauchamp and the M5, although the purpose of Option 9 was to consider a higher standard of junction with the M5. Option 9 therefore includes free-flowing slip roads to the north and south, with no direct connection to junction 25.

Figure 5.12: Route Option 9



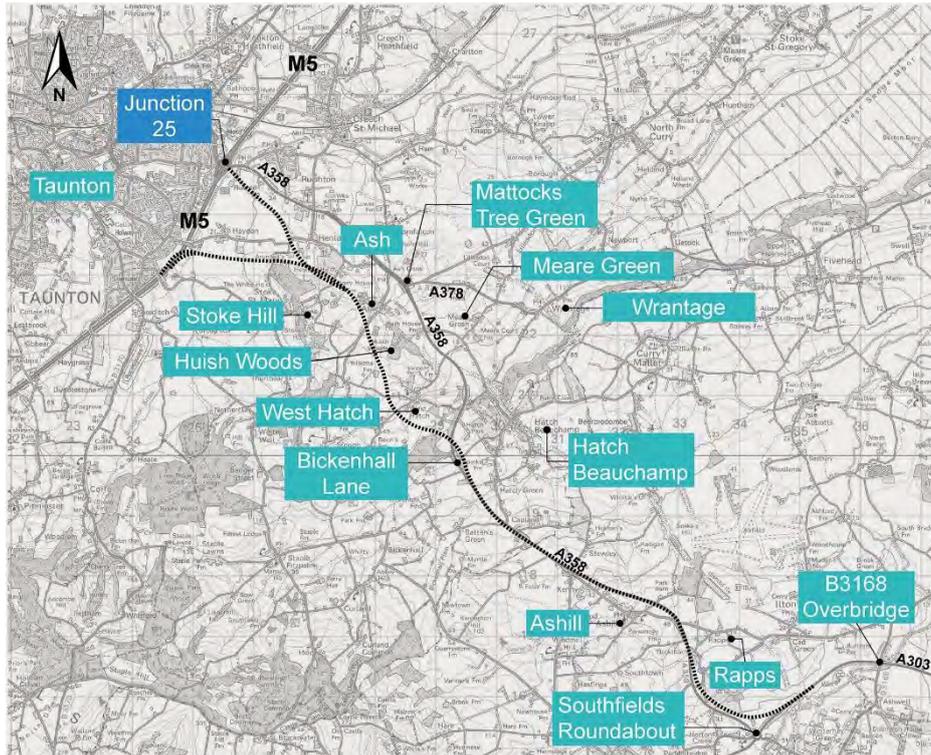
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5.5.31. The north-facing slip roads cross the position of junction 25, and as such would pass either over or under the existing junction.

Option 13

5.5.32. Option 13 is presented in Figure 5.13. The objective of this option was to consider a slight alternative to Option 8 at the centre of the scheme involving a route to the south of Huish Woods and the village of West Hatch, rather than following the bends around Hatch Beauchamp Bypass which are not to current standards.

Figure 5.13: Route Option 13



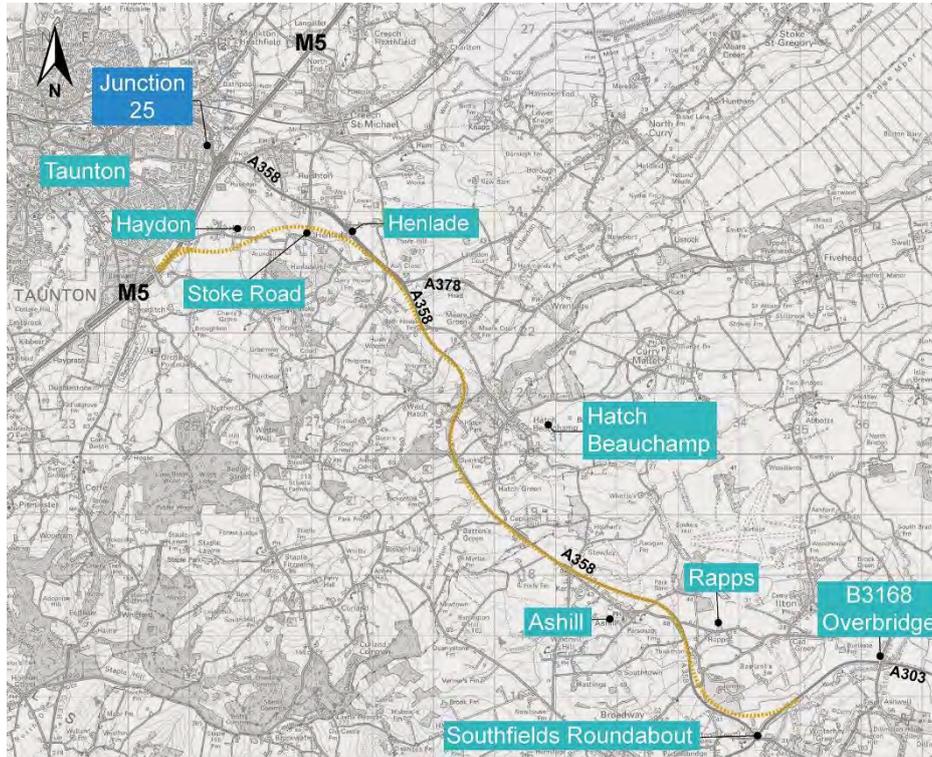
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5.5.33. Between the A303 Ilminster Bypass and the A358 Hatch Beauchamp Bypass, this option is identical to Option 8. However, just prior to the commencement of the double bends of the bypass, at Bickenhall Lane, the proposed route would take an offline course, initially westwards to the south of West Hatch, and then north to join the alignment of Option 8 just to the west of Ash. From this point onwards, this option is identical to Option 8.

Option 16

- 5.5.34. Option 16, presented in Figure 5.14, was developed as a variation to the fully online route (Option 3) to investigate the benefits that an enhanced connection to the M5 south would bring to the concept of an online solution.

Figure 5.14: Route Option 16



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- 5.5.35. From the tie-in with the A303 Ilminster Bypass the road follows a looped alignment taking it parallel to the existing A303 and A358, close to the Southfields Roundabout and south of the village of Rapps. Once on the alignment of the existing A358, this option would involve online widening of the existing carriageway through to just west of the existing junction with the A378. The proposed road would then pass through the gap in residential property along Stoke Road, Henlade, and then travel south past Haydon to join the M5 at a new south-facing junction.
- 5.5.36. This option does not include a north-facing connection to the M5 or to Taunton. As such, traffic to and from the M5 north and Taunton is required to travel through Henlade along the existing A358 carriageway. It is likely that this would be facilitated by a new junction between the proposed road and the existing A358 somewhere between Henlade and the A378.

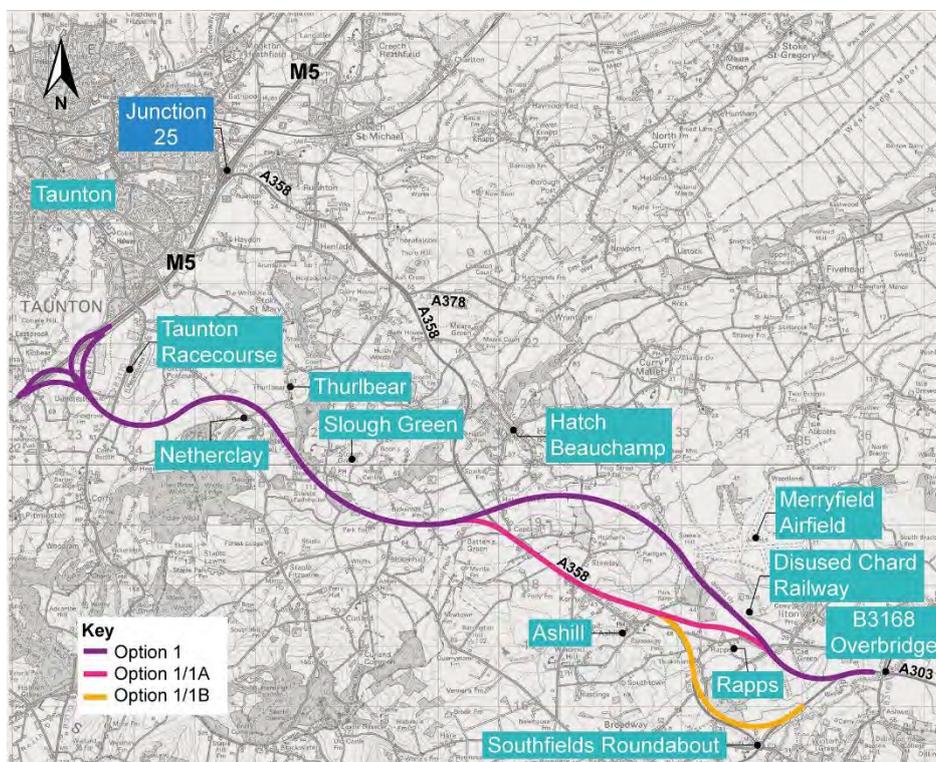
5.6. Southern routes in detail

5.6.1. Initially, three southern routes were developed, a common theme being that they would all connect to the M5 at a new junction to the south of junction 25. As a consequence, these options would all be offline along all or the majority of their length. These options were 1, 14 and 15.

Option 1 and its variants

5.6.2. Option 1 follows the most southerly corridor, eventually connecting to the M5 approximately 2.5 miles (4 kilometres) to the south of junction 25, near the Taunton Racecourse. Option 1 and its variants are presented in Figure 5.15.

Figure 5.15: Route Option 1 and its variants



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Option 1

5.6.3. Option 1 is entirely offline. From its tie-in with the A303 Ilminster Bypass, the proposed route initially runs in a north-westerly direction following the route of the dismantled Chard Branch Line railway, past the RNAS Merryfield. Once past the airfield, the route leaves the dismantled railway line and arcs round to a south-westerly direction, crossing the existing A358 to the south of Hatch Beauchamp.

-
- 5.6.4. The route would again turn to a north-westerly direction, and weave to the south of Slough Green, north of Netherclay and south of the Taunton Racecourse before finally joining with the M5 at the southern limits of Taunton.

Option 1/1A

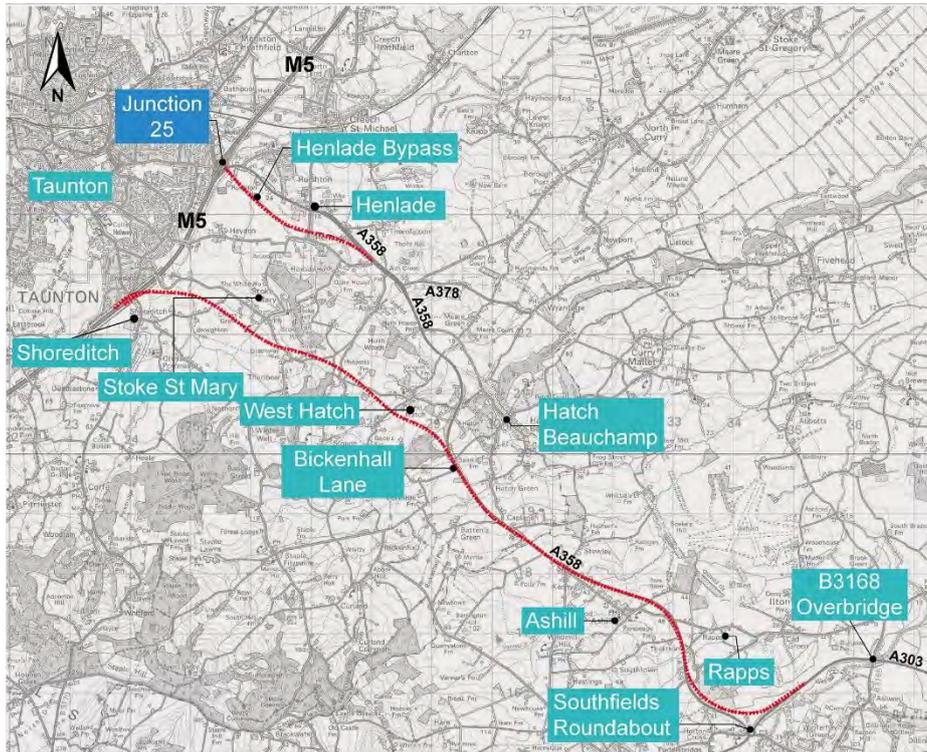
- 5.6.5. Option 1/1A is substantially offline, although it would make use of the existing A358 corridor between Ashill and Hatch Beauchamp.
- 5.6.6. From the east, Option 1/1A ties into the A303 Ilminster Bypass at the B3168 overbridge. At this point the existing A303 bears southwards, although the proposed route would follow a direct offline alignment between the B3168 overbridge and Ashill, to the north of the village of Rapps. The route then follows the line of the existing A358 Ashill Bypass for approximately 1.5 miles (2.5 kilometres), until just south of Hatch Beauchamp.
- 5.6.7. At this point, the route would join Option 1 and be identical.

Option 1/1B

- 5.6.8. Option 1/1B follows an identical course to Option 1/1A for the majority of its length. However, towards its southern limits this option would follow a looped alignment taking it parallel to the existing A303 and A358, close to the Southfields Roundabout and south of the village of Rapps
- 5.6.9. From this point onwards, this option would be identical to Option 1/1A.

Option 14

- 5.6.10. Option 14 was developed to investigate a corridor between those followed by Options 8 and 1 and is presented in Figure 5.16. As this route would connect to the M5 adjacent to the built-up area of south east Taunton, it was considered that it would be difficult to provide north-facing connections to the M5 at this location. As such it is proposed that this option would also include a new bypass of Henlade in the expectation that any traffic between Ilminster and Taunton/M5 north would travel along the original A358.

Figure 5.16: Route Option 14

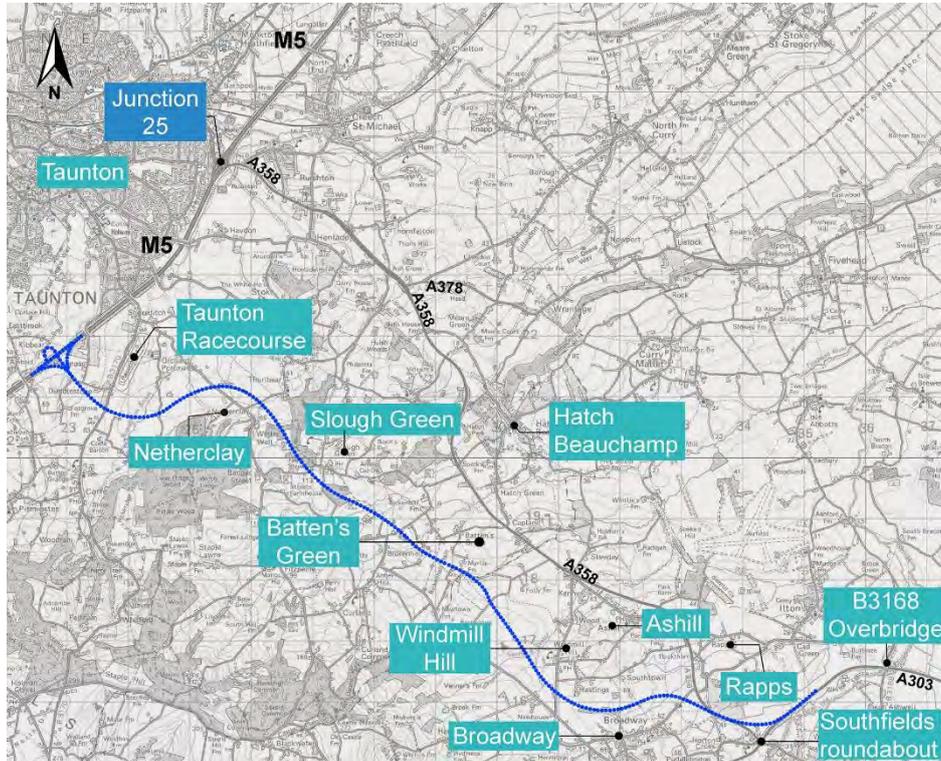
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- 5.6.11. Option 14 is identical to Option 13 until Bickenhall Lane. At this point it leaves the existing A358 and passes to the south of West Hatch. Where Option 13 would turn northwards at this point, Option 14 continues north-westwards to the south of Stoke St Mary before turning to meet the M5 in a southerly direction at Shoreditch.
- 5.6.12. Due to the proximity of this option to the built-up suburbs of Taunton, it is considered that a north-facing connection to the M5 at this location would not be possible. A junction at Bickenhall Lane would be required to enable traffic to pass between the new road and the existing A358, allowing access to the M5 north and Taunton via the existing A358 and junction 25. In order to remove this traffic from the village of Henlade, a separate 'Henlade Bypass' would be included as part of this option. Unlike Options 2/2D and 2A/2D, only a single carriageway version of the Henlade Bypass was considered for Option 14.

Option 15

5.6.13. Option 15 is a variation of Option 1 and presented in Figure 5.17. The western section would be identical to Option 1 whereas the eastern section would follow a more southerly route than any of the variants of Option 1.

Figure 5.17: Route Option 15



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5.6.14. From the tie-in with the A303 Ilminster Bypass, the proposed route would move offline to the north of the existing Southfields Roundabout, and then cross the existing A358 to travel north of Broadway but south of Windmill Hill and Ashill. The road would continue in a north-westerly direction until it reached Batten's Green, where it would join the route of Option 1. Option 15 would be identical to Option 1 from this point onwards.

6. Options Sifting

6.1. Initial sifting

- 6.1.1. The purpose of the initial sifting was to shortlist the best-performing options for further detailed assessment.
- 6.1.2. The Options Sifting process was undertaken in accordance with the Department for Transport's Transport Analysis Guidance – The Transport Appraisal Process (WebTAG) (January 2014), (<https://www.gov.uk/guidance/transport-analysis-guidance-webtag>). At the time of the sift, the A358 Taunton to Southfields scheme was at the Project Control Framework (PCF) Stage 1: Options Identification stage.
- 6.1.3. The Early Assessment and Sifting Tool (EAST) forms part of Step 6 of WebTAG - Initial Sifting. However, it should be noted that the EAST does not provide a score at the end of the analysis and therefore does not allow options to be numerically compared. For the purposes of this scheme, the assessment team followed the sifting process within EAST in order to produce a bespoke scoring mechanism which allowed each option to be directly compared and ranked to identify the best options.
- 6.1.4. The sift was split into two phases.
- In Phase 1 of the sift, the options were scored against the strategic aspects within EAST. Any option which scored poorly was removed from the process and all remaining options were taken forward to the Phase 2 sift.
 - In Phase 2 of the sift, the remaining options were measured against the economic, financial, managerial and commercial aspects.
- 6.1.5. The EAST strategic categories are:
- The scale of the impact
 - Fit with wider government and transport objectives
 - Fit with other objectives
 - The degree of consensus over outcomes
 - Road tolling and charging
 - Key uncertainties
- 6.1.6. The following EAST strategic categories that were covered in the Phase 1 sift are:
- **The scale of the impact** – this was aligned with the Road Investment Strategy and covered the following:
 - Providing capacity and connectivity to support national and local economic activity
 - Supporting and improving journey quality, reliability and safety
 - Joining our communities and linking effectively to each other

- Supporting delivery of environmental goals and the move to a low carbon economy
- **Fit with wider government and transport objectives** – this was aligned with the National Policy Statement for National Networks and covered the following:
 - Environmental and Social Impacts – does the option minimise social and environmental impacts and improve quality of life?
 - Emissions – does the option help the government meet its targets to reduce emissions in terms of carbon and air quality?
 - Safety – has the opportunity been made to improve road safety, including introducing the most modern and efficient safety measures where proportionate?
 - Technology – does the option make use of technology?
 - Sustainable transport – does the option assist in developing cycling and walking networks?
 - Accessibility – does the option assist in creating a more accessible network that provides a range of opportunities and choices for people to connect with job, services and friends and family?
- **Fit with other objectives** – this was aligned with the Client Scheme Requirements and covered the following:
 - Support economic growth – to support economic growth in employment at key locations and centres along the A303 / A358 / A30 corridor and to the SW Region and to facilitate growth in housing at key development hotspots along the corridor
 - Capacity – to reduce delays and queues that occur during peak hours and at seasonal times of the year
 - Resilience – to improve the resilience of the A303 / A358 / A30 route corridor
 - Safety along the A303 / A358 / A30 corridor – to improve safety along the A303 / A358 / A30 route corridor and along the A358 Taunton to Southfields Roundabout route for non-motorised users (NMUs)
 - Connectivity – to improve the connectivity of the south west to the rest of the UK, to reduce peripherality and improve business and growth prospects
 - Environmental – to avoid unacceptable impacts on the surrounding natural environment and landscape and optimise the environmental opportunities and mitigation that the intervention could bring
 - Reduce severance on local communities
 - Promote opportunities to improve the quality of life
- The degree of consensus over outcomes

6.1.7. Two aspects that potentially could have been covered in the EAST but were discarded prior to the sift were

- Road tolling and charging – there is no intention for the A358 to be covered by any road toll or charging mechanism, so this category is not relevant
- Key uncertainties – these were judged not to be a material consideration so were not scored

6.1.8. The Phase 2 sift carried out in accordance with EAST covers the following 4 main topics;

- Economic
 - Economic growth in terms of connectivity. How does the scheme impact on end-to-end journey time and how does the scheme impact on the costs of the operation of vehicles, fares etc.?
 - Economic growth in terms of reliability. How does the scheme impact on the variability of day-to-day journey times and the number of incidents affecting the reliability?
 - Economic growth in terms of resilience
 - Economic growth in terms of delivery of housing
 - Carbon emissions in terms of activity, embedded carbon, carbon content and efficiency
 - Socio-distributional impacts and the region in terms of regeneration
 - Socio-distributional impacts and the region in terms of addressing the regional imbalance in a regionally weak region and the direct impact on economic growth.
 - Local environmental impacts on air quality, both the wider effects on local air quality and the specific effects on the AQMA
 - Local environmental impacts on noise, both to reduce absolute disturbance from noise and the effects on problem areas
 - Local environmental impacts on the natural environment, heritage and landscape, both the effect on the natural and urban environments and the value of the environment affected
 - Local environmental impacts on the aim to improve streetscape and the urban environment
 - Wellbeing and the effects on severance
 - Wellbeing and the effects on injuries and deaths, both on the number of killed and seriously injured (KSI) incidents and the effects on the risks of travelling in terms of incidents per kilometre
 - Wellbeing and the effects on crime
 - Wellbeing and the effects on access to a range of goods and services, including the impacts on end-to-end journey times and the costs of the travel, improvement on access to key locations, impacts on day-to-day variability of incidents as well as the change in the number of those incidents.

- Expected value for money of the scheme – is the scheme worthwhile?
 - Managerial
 - Implementation timetable – is this achievable and reasonable?
 - Public acceptability – will the scheme be accepted or opposed by the public?
 - Practical feasibility – is the scheme buildable and can it be maintained effectively?
 - Quality of supporting evidence – Is there evidence to support the conclusions and how robust is that evidence?
 - Financial
 - Is the scheme affordable?
 - Are the capital costs reasonable?
 - What is the overall risk in terms of cost?
 - Commercial
 - Is the option considered flexible?
- 6.1.9. A summary of the sifting methodology, including the scoring mechanism, is contained in Appendix C.
- 6.1.10. A description of how the options under consideration performed against the criteria listed above and how the options were correspondingly scored using the Appendix C thresholds is provided below.

2006-07 Scheme

- 6.1.11. The previous scheme proposal that was presented for public consultation in 2006-07 was also assessed during this process to determine how this compared with the newly identified options. In addition to the 27 options that are identified in Chapter 5 of this report, this has resulted in a total of 28 options being assessed during the sifting process described in the following text.

Junction strategy

- 6.1.12. During the assessment that is described in this section, the route choices that are likely to be made by drivers travelling between Taunton, the M5 and the A303 were considered. It was concluded that the junction strategies described for variants of Options 1, 4 and 11 were likely to influence route selection in a particular manner, and this has been reflected in the assessments as described below.
- 6.1.13. The provision of a new all movements junction on the M5 for Options 1,4 and 11 and their variants essentially provides traffic with two route choices between Taunton/the M5 and the A303. They could either travel along the entire length of the proposed route, using the new motorway junction, or they could opt to use junction 25 and the existing A358 as they would currently do.

-
- 6.1.14. In the case of the composite online/offline options (namely Options 1/1A, 1/1B, 4 and 4/4A) the intermediate junction at the point where the proposed and existing routes diverge would facilitate the continued use of the existing route. For these options, it was considered that a greater proportion of traffic travelling to and from Taunton would use the existing route to the west of this junction as it would be more direct than the proposed route.
- 6.1.15. In the case of the entirely offline options (namely Options 1, 11 and 11C) the use of the existing A358 would be slightly less attractive, given its length.
- 6.1.16. During the assessment, Options 1/1A and 1/1B were assessed assuming more traffic would be encouraged to use the existing A358 through the centre of Henlade than Option 1 as a result of the provision of this intermediate junction. Similarly, Options 4 and 4/4A were assessed as if more traffic would be encouraged to travel through Henlade than for Options 11 and 11C.

6.2. Phase 1 sift

- 6.2.1. Scale of Impact – Phase 1 of the sift was scored on the ability of the options to improve network capacity and connectivity as well as facilitate economic growth, as set out in EAST, namely:

Providing capacity and connectivity to support national and local economic activity (RIS Objective)

- 6.2.2. Option 1 and its variants were considered to be amongst the most beneficial for road users travelling to and from the south west as these options provide the shortest travel distance for long-distance traffic. However, it was noted that these options would not provide a solution to local traffic issues around junction 25. As such these options were judged to have a moderate impact in providing capacity.
- 6.2.3. Options 2 and 8 and their variants were amongst the most direct routes for travel to and from Taunton, and have reasonably short travel distances to and from the north and south. Variants of Option 2 and 8 were therefore assessed to fully address the identified problem although variants that comprised a southerly loop close to the Southfields Roundabout rather than a more direct route past the village of Rapps were judged to have a significant impact reflecting slightly longer travel distances.
- 6.2.4. Scoring of options that comprised a single carriageway version of the Henlade Bypass were assessed to make a moderately beneficial contribution to this aspect due to the potentially limited capacity of these links.
- 6.2.5. Scoring of options that comprised a dual carriageway version of the Henlade Bypass were assessed to be more beneficial than equivalent options that consisted of a single carriageway bypass of Henlade.

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- 6.2.6. Option 3 involved the upgrade of the existing A358 to dual carriageway standard providing additional capacity. However, it did not provide free flowing links to the M5 in any direction and would therefore add to the congestion at junction 25. This option was therefore considered to provide only a small contribution to supporting national and local economic activity, and was therefore assessed to only have a small impact in providing capacity and connectivity.
- 6.2.7. Option 4 and 4/4A would impose relatively long travel distances for traffic heading to and from the south. Given that one of the objectives of the scheme is to improve connectivity of the south west to the rest of the country these options were therefore considered to make only a minor contribution to this aspect.
- 6.2.8. Options 11 and 11C follow a northern alignment to a northern junction similar to Options 4 and 4/4A. However, Options 11 and 11C impose shorter travel distances than the variants of Option 4 and follow a completely offline route enabling the existing A358 to be retained as an entirely separate local route. As such they have been judged to make a moderate contribution to the aspect of capacity and connectivity.
- 6.2.9. Options 12 and 13, being amongst the shortest options, and also comprising a connection to junction 25, have been judged to fully address requirements for connectivity and capacity.
- 6.2.10. The 2006-07 Scheme was identical to Option 2A/2D in respect of capacity and connectivity and has therefore been allocated the same score as Option 2A/2D in this category.
- 6.2.11. Option 14 was similar to Option 2A/2D in respect of capacity and connectivity and so was scored similarly.
- 6.2.12. Option 15 was considered to be one of the most beneficial options for road users travelling to and from the south west as it provided the shortest travel distance for long-distance traffic. However, it was noted that this option would not provide a solution to local traffic issues around junction 25. As such it has been judged to provide a moderate impact to provide capacity and connectivity.
- 6.2.13. Option 16 was judged to make only a minor contribution to this aspect as it essentially comprised an online upgrade of the A358 which would limit the quality of the alignment. The route to and from Taunton and the north would be through Henlade which would limit the overall effectiveness of this option.

Supporting and improving journey quality, reliability and safety (RIS Objective)

- 6.2.14. All options were expected to improve journey quality, reliability and safety by providing dual carriageway alignments to modern design standards. In general, therefore, these options were judged to have a significant contribution to this aspect.
- 6.2.15. However, the highest possible score was given to fully offline options with a new southern junction on the M5 as they would maximise this aspect and fully address the identified problem. Fully offline options with a junction to the north were not awarded this higher score as it was considered likely that the spacing between the proposed junction and the existing junction 25 would be less than desirable. Option 3 (the online option) was scored to have a moderate impact as the intention would be to maximise use of the existing road corridor for this option, and would be an alignment that is not to current standards with associated safety implications.

Joining our communities and linking effectively to each other (RIS Objective)

- 6.2.16. All options were awarded the same score as in 'providing capacity and connectivity to support national and local economic activity', to reflect that these aspects were similar in nature and options would therefore make a similar contribution to addressing this aspect.

Supporting delivery of environmental goals and the move to a local carbon economy (RIS Objective)

- 6.2.17. Option 1 and its variants would remove traffic from the Air Quality Management Area (AQMA) and Noise Important Areas (NIAs) in Henlade, which was considered to be a significant beneficial aspect. However, they would all require the significant acquisition of rural greenfield sites for their alignments to be constructed and as such overall these options were judged to make only a moderate contribution to the delivery of environmental goals.
- 6.2.18. Option 3, which would comprise the re-use of a significant amount of the existing A358 corridor, was considered to make only a small contribution to environmental goals as it would make no improvement to conditions in the AQMA in Henlade, and may actually result in further deterioration due to increased traffic levels. It was therefore judged to have only a small impact.
- 6.2.19. Variants of Options 4, 11 and Option 12 were judged to make a similar contribution to environmental goals as Option 1 and were therefore scored equally.
- 6.2.20. Option 14 was judged to make only a moderate contribution to environmental goals, providing only a moderate impact, as its route would pass within 200 metres of Thurlbear Wood and Quarrylands SSSI and Ancient Woodland.

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- 6.2.21. Option 15 would also pass close to Thurlbear Wood and Quarrylands SSSI and Ancient Woodland, and require acquisition of a significant amount of rural land as it would be fully offline. As such it was judged to make only a minor impact to the identified problem.
- 6.2.22. Option 16 was judged to make only a minor contribution to environmental goals as significant amounts of traffic to and from Taunton and the north would still travel along the existing A358 through Henlade, and so this option would have a limited effect on the current AQMA.
- 6.2.23. All remaining options would be located close to or reuse sections of the A358 and were considered to have a significant impact on the identified problem, while limiting the amount of land that would be required for their construction.

Fit with wider government and transport (NPSNN) objectives

- 6.2.24. The National Policy Statement for National Networks (NPSNN) (Department for Transport, December 2014) was used to measure each option against wider government and transport objectives, namely:
- Environment and social impacts
 - Emissions
 - Safety
 - Technology
 - Sustainable transport
 - Accessibility
- 6.2.25. These are addressed below.

Environmental and Social Impact

- 6.2.26. Option 1 and its variants would not pass close to existing population centres and were therefore anticipated to be amongst the most beneficial options to the majority of residents within the scheme area. These options were scored as having a good fit with objectives for social impact.
- 6.2.27. Option 3 would have a poor fit with social objectives as traffic would continue to travel through the village of Henlade.
- 6.2.28. Option 15 would not pass close to existing population centres and was therefore anticipated to be one of the most beneficial options to the majority of residents within the scheme area. This option was scored as having a good fit with objectives for social impact.
- 6.2.29. Although Option 16 would remove traffic to and from the south from Henlade, all other journeys would still involve travel through Henlade. As such this option was judged to have a low fit with social objectives.

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- 6.2.30. The 2006-07 scheme, although removing most of the through traffic from Henlade, would require acquisition of playing fields to the west of the M5 at Blackbrook, and was therefore judged to have a low fit with social objectives.
- 6.2.31. All other options were judged to have a reasonable fit with social objectives as, although they remove traffic away from Henlade and the associated AQMA, the proposed alignments would still remain in close proximity to the village.

Emissions

- 6.2.32. Versions of Options 2/2D and 2A/2D that comprised a single carriageway Henlade Bypass were judged to have a reasonable fit with objectives for emissions as, although the versions that comprised single carriageway versions of Henlade Bypass would remove through traffic from the village centre, they would have a lower capacity than those options providing a dual carriageway link to junction 25 and were therefore expected to be more susceptible to congestion which may increase emissions in the village.
- 6.2.33. Option 3 would require all traffic to continue to travel through Henlade as it currently does. It was therefore expected that this option would not improve emissions in the AQMA and was therefore judged to have a poor fit with objectives for emissions.
- 6.2.34. Option 16 would have a similar alignment to Option 3, although it would include south facing connections with the M5 meaning that traffic to and from the south would be removed from the centre of Henlade. This option was therefore judged to have a low fit with objectives for emissions.
- 6.2.35. The alignments of Options 14 and 15 would pass within 200 metres of Thurlbear Wood and Quarrylands SSSI and Ancient Woodland. These sites will be susceptible to increases in concentrations of pollutants and these two options have therefore been judged to have a low fit with objectives for emissions.
- 6.2.36. All remaining options would remove traffic from the existing A358 in the vicinity of Henlade, including the AQMA, and were therefore judged to have a good fit with emissions objectives.

Safety

- 6.2.37. All options being proposed were being designed to modern standards. Some options would re-use the existing bends around the Hatch Beauchamp Bypass which would be likely to require technical approval as the alignment would not meet geometric standards. For this reason, options that follow the Hatch Beauchamp Bypass were judged to have a reasonable fit with safety objectives, and all other options were judged to have a good fit.

Technology

- 6.2.38. Technology is not expected to be implemented within the scheme. However, the options would be designed with the potential for technology to be added at a later stage. All options were judged to have a good fit to reflect this with the exception of Option 3. The alignment of this option would take it through the centre of Henlade and it was envisaged that visual intrusion of variable message signs may inhibit the use of technology through this section.

Sustainable Transport

- 6.2.39. Versions of Options 2/2D and 2A/2D which would comprise only a single carriageway Henlade Bypass would remove traffic from the village centre to a degree. However, it was anticipated that the single carriageway sections might result in some congestion. This may cause some rat-running through the village which would restrict the convenience and comfort of some sustainable transport methods. These options were therefore assessed to have a reasonable fit with sustainable transport objectives.
- 6.2.40. Option 3, which would involve the upgrading of the existing A358 to dual carriageway through the centre of the village of Henlade, would not facilitate the development of convenient and comfortable walking and cycling networks. It was therefore judged to have a poor fit with objectives for sustainable transport.
- 6.2.41. Option 16 would limit the opportunities for sustainable transport through Henlade as all traffic to and from Taunton and the M5 north would still travel through the village. This option was therefore judged to have a low fit with sustainable transport objectives.
- 6.2.42. Option 14, which would comprise only a single carriageway Henlade Bypass, was assessed to have a reasonable fit with sustainable transport objectives for similar reasons as Options 2/2D and 2A/2D.
- 6.2.43. All other options would provide dual carriageway links to junction 25 that would avoid through traffic travelling through the centre of Henlade, and were therefore considered to have a good fit with sustainable transport objectives.

Accessibility

6.2.44. The way in which engineering solutions addressed objectives for accessibility were judged to be very similar to the way in which they addressed objectives for sustainable transport. As such the same scores were generally allocated for accessibility as for sustainable transport. However, options that would comprise high quality slip roads at junction 25 that would clash with the proposed Nexus 25 Strategic Employment Site at junction 25 were judged to promote accessibility to a lesser degree. The Strategic Employment Site is identified in Taunton Deane Borough Council's (TDBC) Core Strategy 2011-2028. These options were therefore judged to have a reasonable fit with accessibility objectives.

Fit with Client Scheme Requirement Objectives

6.2.45. The options were also evaluated against the Client Scheme Requirements objectives set out in Section 2.

Supporting Economic Growth

6.2.46. This objective was scored on the ability of each option to accommodate and facilitate future economic growth in the region and in particular planned developments within the vicinity of junction 25.

6.2.47. The 2006-07 Scheme would comprise new links through the proposed Strategic Employment Site, inhibiting the development of that site and associated economic growth. As such the scheme was assessed to have a poor fit with objectives for economic growth.

6.2.48. Options 2/2D and 2A/2D that would comprise only a single carriageway Henlade Bypass may not have provided sufficient capacity for the Strategic Employment Site and into Taunton and so were assessed to have only a reasonable fit with economic growth objectives. Option 14 was assessed similarly.

6.2.49. Option 7 would provide slip roads through the proposed Strategic Employment Site so was also judged to have a poor fit with economic growth objectives.

6.2.50. Option 3 would introduce limited additional capacity to accommodate future growth in the region and was therefore assessed to have a poor fit with objectives for supporting economic growth.

6.2.51. Option 9 would provide slip roads through the proposed Strategic Employment Site so was judged to have a poor fit with economic growth objectives.

6.2.52. Options 4 and 4/4A were judged to have a low fit because, since the alignment would have tied into the M5 to the north of junction 25, these options would not provide additional capacity along the existing A358 through Henlade to facilitate the proposed Strategic Employment Site at junction 25.

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- 6.2.53. Option 1 and its variants would connect to the M5 south of junction 25 and, whilst they were not expected to provide direct access to the proposed Strategic Employment Site at junction 25, they were expected to increase connectivity with the south west and promote economic growth. They were therefore judged to have a reasonable fit with economic growth objectives.
- 6.2.54. Options 11 and 11C, located to the north of junction 25, were not expected to provide direct access to the proposed development at junction 25 but were expected to support economic growth along the A303 / A358 corridor. These options would provide shorter journeys to Taunton and to the north, while increasing journey times to the south, and have therefore been judged to have a reasonable fit with economic growth objectives.
- 6.2.55. Option 15 has been judged to have a reasonable fit with economic growth objectives because it would provide a relatively good quality connection to the south west.
- 6.2.56. Options 12 and 13 would be relatively direct and provide a dual carriageway link to junction 25. They were therefore judged to have an excellent fit with economic objectives.
- 6.2.57. Option 16 was also judged to have a low fit as this option would not provide additional capacity along the existing A358 through Henlade to facilitate the proposed development.
- 6.2.58. The remaining options would all follow the existing A358 corridor and provide a new dual carriageway link to junction 25 passing to the south of Henlade village centre where direct access to the planned development at junction 25 could be provided. These options were broken down into two distinct groups depending upon their alignments towards the southern limits of the scheme. Options that would follow a direct route between the B3168 overbridge and the existing A358 at Ashill (passing close to Rapps) were judged to have an excellent fit with objectives. Options which would take a southerly loop taking them close to Southfields Roundabout would have a slightly longer alignment and were therefore considered to be slightly less beneficial in supporting economic growth across the region and were assessed to have a good fit.

Capacity

- 6.2.59. All of the options were anticipated to increase capacity along the A303 / A358 corridor by upgrading the current single carriageway to full grade separated dual carriageway, and were therefore expected to make a positive contribution to this objective.
- 6.2.60. Versions of Options 2/2D and 2A/2D which would provide only a single carriageway Henlade Bypass were assessed to have a low fit with capacity objectives as the provision of a single carriageway link to junction 25 would provide limited new road capacity on the approach to the M5.

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- 6.2.61. Option 3 would provide limited new capacity along the A358 corridor as it would require all traffic to pass through junction 25 as it currently does. This option has therefore been judged to have a poor fit with capacity objectives.
- 6.2.62. Option 14, which would provide only a single carriageway Henlade Bypass, was assessed in a similar manner to Options 2/2D and 2A/2D.
- 6.2.63. Option 16 would provide some relief for junction 25 as traffic to and from the south would be removed from the junction and from Henlade village centre through the construction of new free flowing slip roads. However significant amounts of traffic would still pass through junction 25 and so this option has also been judged to have a poor fit.
- 6.2.64. All other options were assessed to have an excellent fit with capacity objectives as they would all provide full dual carriageway elements including new dual carriageway links to junction 25 which would have been an improvement over the current single carriageway through Henlade.

Resilience

- 6.2.65. This objective was scored on the ability of the network to cope should the capacity of the proposed road be restricted due to planned maintenance work or emergencies. All options were judged to have at least a reasonable fit due to the improvements to resilience of the existing route that would be realised by upgrading from single to dual carriageway.
- 6.2.66. Option 3 was scored a reasonable fit as it would not provide any additional resilience over and above that provided by the dual carriageway itself.
- 6.2.67. Option 16 was assessed to be a reasonable fit with resilience objectives as, although it would provide a dual carriageway route for traffic to and from the south, it would require a significant proportion of traffic to continue using the existing A358 through Henlade to access Taunton and the north.
- 6.2.68. Those options which would be partially offline were judged to have a good fit as some sections of the A358 could be retained and linked together to provide a parallel route which may provide an alternative route during incidents or planned works.
- 6.2.69. All fully offline options were judged to have an excellent fit as the existing A358 could be retained in its entirety, providing a complete alternative route between the A303 and the M5 during times of planned works or emergencies on the new road.

Safety along the A303 / A30 / A358 Corridor

- 6.2.70. All options will be designed to modern geometric design standards.

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- 6.2.71. Options which reuse the current A358 around the west of Hatch Beauchamp (namely Options 2/2B, 2A/2B, 8/8B, 8A/8B and the 2006-07 Scheme) were assessed to have only a reasonable fit with safety objectives to reflect the fact that the current alignment was designed for a lower speed than is planned for the proposed dual carriageway. The intention would be to reuse this section of the A358 reducing the amount of land and new road that would be required, although specific technical approval would be required to adopt this alignment into the scheme as it is not to current standards.
- 6.2.72. Options 4 and 4A would comprise a new junction on the M5 to the north of junction 25, and the distance between the two junctions would be likely not to be compliant with design standards. Furthermore, these options would include an intermediate junction between the proposed route and existing A358 that is discussed under the junction Strategy above (see paragraphs 6.1.10 – 6.1.14). This junction would be expected to result in a significant proportion of traffic to and from Taunton travelling through Henlade. This would have safety implications, and so these options were assessed to have only a reasonable fit with safety objectives.
- 6.2.73. Whilst Options 11 and 11C would also connect to the M5 north of junction 25 (at the same location as Options 4 and 4/4A), these options would be entirely offline and so would not include an intermediate junction between the existing A358 and the proposed road. This would reduce the amount of Taunton traffic on the existing, lower standard road and as such safety standards would be likely to be higher than for Options 4 and 4/4A. Options 11 and 11C were therefore judged to have a good fit with safety objectives.
- 6.2.74. All remaining options would have elements that would all be expected to fully meet geometric design standards and so were assessed to have a good fit with safety objectives.

Connectivity

- 6.2.75. Options under this section were assessed in exactly the same way as under the “Scale of Impact - Providing capacity and connectivity to support national and local economic activity” section, earlier in this section.

Environmental

- 6.2.76. Offline options were anticipated to have the greatest impact on the existing environment while also conflicting with established Environmental Policies.
- 6.2.77. Option 1 and variants were anticipated to have a significant impact on the environment, and were therefore assessed to have a poor fit with environmental objectives. The proposed alignments would pass close to the Blackdown Hills Area of Outstanding Natural Beauty (AONB), Thurlbear Wood and Quarrylands SSSI and Ancient Woodland, and would also cross several floodplains.

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- 6.2.78. Option 15 would also pass close to these environmental constraints, and in addition pass close to Barrington Hill Meadows SSSI. This option was therefore also judged to have a poor fit.
- 6.2.79. Options 11 and 11C would pass through or close to the River Tone and Widness Rhyne floodplains, the Wrantage Cover Ancient Woodland and Wildlife Site, Rock Hill Wood Ancient Woodland, Fieldgate Lane Fields Local Wildlife Site and Ashill Wood/Every's Copse Ancient Woodland and Local Wildlife Site. As a result of the potential impacts on these sites, these options were also judged to have a poor fit with environmental objectives.
- 6.2.80. Options 4 and 4/4A would share similarities with Options 11 and 11C at the western extents of the scheme including the clashes with environmental constraints including the floodplains related to the River Tone and Widness Rhyne. However, towards the east Options 4 and 4/4A would follow an online corridor and would therefore be likely to have less of an impact through this section. As such they were judged to have a low fit, which is slightly better than Options 11 and 11C.
- 6.2.81. Option 14 would pass within 200 metres of Thurlbear Wood and Quarrylands SSSI, Thurlbear Wood Ancient Woodland, Bickenhall Wood Ancient Woodland as well as traversing the many floodplains that are present within this area. However, it would not pass as close to the Blackdown Hills AONB and would therefore be slightly better in this respect than Option 1. It was therefore assessed to have a low fit with objectives.
- 6.2.82. Option 12 would tie into the M5 near a series of floodplains associated with Broughton Brook. The link to junction 25 would be constrained by the presence of the floodplain linked to the tributary of the Black Brook. The alignment of this option would bring it close to Stoke Wood Ancient Woodland and Hatch Court Park, which is a Registered Park and Garden. South of Royal Naval Air Station (RNAS) Merryfield (formerly known as RAF Merryfield), the alignment would follow a disused railway line, which dissects Ashill Wood/Every's Copse Ancient Woodland and a Local Wildlife Site. This option would also clash with several floodplains located close to Southfields Roundabout. The option was therefore assessed to have a low fit with objectives.
- 6.2.83. Option 3 (which would comprise an upgrade of the existing A358 to dual carriageway along the majority of its length) was considered to have a good fit with environmental objectives. Reusing the existing alignment would limit the impact on the environment and it was anticipated that few new environmental impacts would have been generated as a result.

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- 6.2.84. Option 2 and all its variants, Option 8 and all of its variants, the 2006-07 Scheme, Option 13 and Option 16 would all reuse sections of the existing A358 and, where they follow an offline alignment, they would remain reasonably close to the current A358 corridor. Reusing the existing A358 limits the impact that these options would have on the environment and would introduce few new environmental impacts. It was considered that these options would all have a reasonable fit with environmental objectives.

Severance to local communities

- 6.2.85. The sift focussed on severance at Henlade, the largest settlement along the corridor, which currently suffers significant severance problems.
- 6.2.86. Option 3 was assessed to have a poor fit with severance objectives as it would involve the upgrade of the existing A358 through Henlade into a dual carriageway, introducing new severance to non-motorised users and restricting access to local services.
- 6.2.87. Option 16 was considered to have a reasonable fit with objectives. A significant proportion of traffic would still travel through Henlade to and from Taunton and the north, although the slip roads to the south that were provided with this option would provide some traffic reduction through Henlade.
- 6.2.88. All other options were anticipated to provide a good fit with objectives for severance as new links would be provided reducing the need for traffic to travel through Henlade, decreasing the local severance that is currently experienced.

Promoting opportunities to improve the quality of life

- 6.2.89. Option 3 would not have involved the removal of any traffic through the centre of Henlade, and therefore would not have made a significant contribution to quality of life objectives. As such it was judged to be a poor fit.
- 6.2.90. Whilst Option 16 would remove some traffic from the centre of Henlade as a result of the inclusion of slip roads to and from the M5 south, a significant proportion of traffic to and from Taunton and the north would still pass through Henlade. As such this option was judged to be a poor fit.
- 6.2.91. The 2006-07 Scheme, whilst displacing some traffic from Henlade, would also require the acquisition of existing playing fields to the west of the M5 to enable the construction of the looped junction. For this reason, the 2006-07 Scheme was judged to be a low fit with quality of life objectives.
- 6.2.92. Variants of Options 2/2D and 2A/2D that would comprise a single carriageway Henlade Bypass would remove traffic from the centre of the village. However, as a result of the existing connections to junction 25 and the existing A358 to the east being maintained, it was considered that this would inhibit any improvements to quality of life and has therefore been judged to be a low fit.

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- 6.2.93. Option 14 was judged to be a low fit for the same reasons as Options 2/2D and 2A/2D.
- 6.2.94. Options which would tie-in to the M5 to the north of junction 25 were judged to have a reasonable fit with quality of life objectives as they would remove traffic from Henlade but may adversely affect the settlement of Creech St. Michael.
- 6.2.95. All remaining options were assessed to have a good fit to reflect the fact that they would greatly reduce the traffic travelling through Henlade, while not adversely affecting other significant population centres.

Degree of consensus over outcomes

- 6.2.96. At the time of the sift, the scheme was at an early stage and little consultation had taken place on the options being proposed.
- 6.2.97. The 2006-07 Scheme was developed for the previous consultation but was subsequently halted due to the location of the proposed junction with the M5 which was unpopular with the public. For this reason, a low score was allocated to this route in this section.
- 6.2.98. Options 2, 8 and 13 (and their variants) were all similar to the previous 2006-07 Scheme in many respects although without elements that were known to be contentious such as the junction loops at Blackbrook and links through the proposed Strategic Employment Site at junction 25. As such a reasonable score was allocated to these options.
- 6.2.99. All remaining options had not been consulted on widely and were scored to reflect this.

Phase 1 sift summary

- 6.2.100. Phase 1 considered the strategic case within EAST and at the end of this phase, Options 3 and 16 were discarded as being particularly low scoring for the reasons below.
- Northbound traffic would continue to use the single carriageway through Henlade
 - There would be less redundancy in the network due to re-using long sections of the existing route
 - They were considered to be slightly less safe than other options due to re-using existing bends at Hatch Beauchamp that are not to current standards
 - Option 3 would make conditions worse at M5 junction 25 as no traffic would be diverted from the junction

Results of the phase 1 sift

6.2.101. The results after phase 1 are outlined in Table 6.1.

Table 6.1: Results of the phase 1 sift

Option	Rank	Score
Option 13	1	78
Option 2	1	78
Option 8	1	78
Option 8/8A	1	78
Option 2/2D ⁶	5	77
Option 12	5	77
Option 2/2B	7	76
Option 8A/8B	7	76
Option 2/2A	9	74
Option 2A/2D ⁷	10	73
Option 2A/2B	11	72
Option 8/8B	11	72
Option 7	11	72
Option 9	11	72
Option 1	15	69
Option 1/1A	16	67
Option 1/1B	16	67
Option 11	18	66
Option 11C	18	66
Option 15	18	66
2006-07 Scheme	21	65
Option 2/2D ⁸	22	61
Option 2A/2D ⁹	22	61
Option 4	24	59
Option 4/4A	24	59
Option 14	26	58
Option 16	27	47
Option 3	28	33

6.2.102. From the above assessment, Options 3 and 16 were discarded.

⁶ With dual carriageway "Henlade Bypass"

⁷ With dual carriageway "Henlade Bypass"

⁸ With single carriageway "Henlade Bypass"

⁹ With single carriageway "Henlade Bypass"

Table 6.2: Phase 1 sift matrix

			Option 1	Option 1/1A	Option 1/1B	Option 2	Option 2/2A	Option 2/2B	Option 2A/2B	Option 2/2D	Option 2/2D (Dual carriageway "Henlade	Option 2A/2D	Option 2A/2D (Dual carriageway "Henlade	Option 7	Option 3	Option 4	Option 4/4A	Option 8	Option 8/8A	Option 8/8B	Option 8A/8B	Option 9	Option 11	Option 11C	Option 12	2006-07 Scheme	Option 13	Option 14	Option 15	Option 16		
Strategic	Scale of Impact (Road Investment Strategy)	Providing capacity and connectivity to support national and local economic activity	3	3	3	5	4	5	4	3	5	3	4	5	1	2	2	5	5	4	5	5	3	3	5	4	5	3	3	2		
		Supporting and improving journey quality, reliability and safety	5	4	4	4	4	4	4	4	4	4	4	4	4	3	3	3	4	4	4	4	4	4	4	5	4	4	4	5	4	
		Joining our communities and linking effectively to each other	3	3	3	5	4	5	4	3	5	3	4	5	1	2	2	5	5	4	5	5	3	3	5	4	5	3	3	2		
		Supporting delivery of environmental goals and the move to a low carbon economy	3	3	3	4	4	4	4	4	4	4	4	4	4	1	3	3	4	4	4	4	4	3	3	3	4	4	3	2	2	
	Fit with wider government and transport objectives (National Policy Statement for National Networks)	Environmental and Social Impacts	Does option minimise social and environmental impacts and improve quality of life?	4	4	4	3	3	3	3	3	3	3	3	3	1	3	3	3	3	3	3	3	3	3	3	2	3	3	4	2	
		Emissions	Does option help the government meet its targets to reduce emissions in terms of carbon and air quality?	4	4	4	4	4	4	4	3	4	3	4	4	1	4	4	4	4	4	4	4	4	4	4	4	4	2	2	2	
		Safety	Has the opportunity been made to improve road safety, including introducing the most modern and efficient safety measures where proportionate	4	4	4	4	4	3	3	4	4	4	4	4	4	3	3	4	4	3	3	4	4	4	4	3	4	4	4	4	
		Technology	Does option make use of technology?	4	4	4	4	4	4	4	4	4	4	4	4	1	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
		Sustainable Transport	Does option assist in developing cycling and walking networks?	4	4	4	4	4	4	4	3	4	3	4	4	1	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	2
		Accessibility	Does option assist in creating a more accessible network that provides a range of opportunities and choices for people to connect with job, services and friends and family?	4	4	4	4	4	4	4	3	4	3	4	3	1	4	4	4	4	4	4	3	4	4	4	4	4	3	4	2	
		Road tolling + charging (can this be neglected?)																														

			Option 1	Option 1/1A	Option 1/1B	Option 2	Option 2/2A	Option 2/2B	Option 2A/2B	Option 2/2D	Option 2/2D (Dual carriageway "Henlade	Option 2A/2D	Option 2A/2D (Dual carriageway "Henlade	Option 7	Option 3	Option 4	Option 4/4A	Option 8	Option 8/8A	Option 8/8B	Option 8A/8B	Option 9	Option 11	Option 11C	Option 12	2006-07 Scheme	Option 13	Option 14	Option 15	Option 16	
Fit with other objectives (CSR)	Support economic growth	1. Support economic growth in employment at key locations and centres along the A303 / A358 / A30 corridor and to the SW Region 2. Facilitate growth in housing at key development hotspots along the corridor	3	3	3	5	4	5	4	3	5	3	4	1	1	2	2	5	5	4	5	1	3	3	5	1	5	3	3	2	
	Capacity	Reduce delays and queues that occur during peak hours and at seasonal times of the year	5	5	5	5	5	5	5	2	5	2	5	5	1	5	5	5	5	5	5	5	5	5	5	5	5	5	2	5	1
	Resilience	Improve the resilience of the A303 / A358 / A30 route corridor	5	4	4	4	4	4	4	4	4	4	4	4	3	4	4	4	4	4	4	4	5	5	5	4	4	4	4	5	3
	Safety: along A303/A358/A30 corridor	1. Improve safety along the A303 / A358 / A30 route corridor 2. Improve safety along the A358 Taunton to Southfields Roundabout route for non-motorised users (NMUs)	4	4	4	4	4	3	3	4	4	4	4	4	4	3	3	4	4	3	3	4	4	4	4	3	4	4	4	4	
	Connectivity	Improve the connectivity of the south west to the rest of the UK, to reduce peripherality and improve business and growth prospects	3	3	3	5	4	5	4	3	5	3	4	5	1	2	2	5	5	4	5	5	3	3	5	4	5	3	3	2	
	Environmental	Avoid unacceptable impacts on the surrounding natural environment and landscape and optimise the environmental opportunities and mitigation that the intervention could bring	1	1	1	3	3	3	3	3	3	3	3	3	4	2	2	3	3	3	3	3	1	1	2	3	3	2	1	3	
	Reduce Severance on local communities		4	4	4	4	4	4	4	4	4	4	4	4	1	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3
	Promote opportunities to improve the quality of life		4	4	4	4	4	4	4	2	4	2	4	4	1	3	3	4	4	4	4	4	4	3	3	4	2	4	2	4	1
Key uncertainties																															
Degree of consensus over outcomes																															
		Score after phase 1 strategic sift	69	67	67	78	74	76	72	61	77	61	73	72	33	59	59	78	78	72	76	72	66	66	77	65	78	58	66	47	
		Rank after phase 1 strategic sift	15	16	16	1	9	7	11	22	5	22	10	11	28	24	24	1	1	11	7	11	18	18	5	21	1	26	18	27	

6.3. Phase 2 sift - Economic growth, managerial, financial and commercial

6.3.1. Phase 2 considered the economic, managerial, financial and commercial aspects of EAST. Full details of the sifting assessment are given below and is summarised in Table 6.4 at the end of the discussion of the options. In the tables within this section 6.3, Options 2/2D & 2A/2D denote those options with the single carriageway bypass at Henlade and Options 2/2D* & 2A/2D* denote those options with the dual carriageway bypass at Henlade. The full matrix, including the strategic criteria and scoring is included in Appendix D – Appraisal Summary Tables

Economic growth

Connectivity

6.3.2. When comparing options against connectivity, a common point on the A303 Ilminster Bypass to the south and common points on the M5 north, M5 south and A358 west of the scheme extents were used to determine travel distances for each option.

Option	Assessment
1, 1/1A, 1/1B, 15	Generally the most direct options to the south west Involve longer travel distances for strategic traffic travelling to the north and into Taunton Hence considered 'slightly beneficial'
2, 2/2B, 2/2D*, 7, 8/8A, 8A/8B	Closely follow the existing A358 corridor but take an offline route to the north of the village of Rapps near the southern scheme limits Generally comprised the shortest overall travel distances and provided the most direct routes to and from Taunton Therefore scored 'largely beneficial' overall
2/2A, 2A/2B, 2A/2D*, 8, 8/8B, 9, 13, 2006-07 Scheme	Follow the more southerly alignment near the southern scheme limits taking them closer to Southfields Roundabout Slightly longer and were therefore judged to be 'moderately beneficial' to road users
2/2D, 2A/2D, 14	Comprise only a single carriageway Henlade Bypass Single carriageway elements would be more susceptible to congestion during peak times Hence were assessed to be 'slightly beneficial' to road users
11, 11C	Comprise the shortest travel distances for road users travelling between the A303 and the M5 north Journey distances to the south and into Taunton would be relatively high compared to other options Hence these options were scored as 'moderately beneficial'
12	Provides one of the shortest routes when all turning movements were taken into account Includes a connection to junction 25 Judged to be 'largely beneficial' in terms of connectivity

Option	Assessment
4, 4/4A	<p>Provide relatively short travel distances to and from the M5 north, similar to Options 11 and 11C</p> <p>When all journeys were taken into account, these options comprise some of the longest travel distances overall, and these options were considered to be worse than Options 11 and 11C in this respect</p> <p>Therefore judged to make only a 'minor contribution' to economic growth</p>

Reliability – impact on variability of day-to-day journey times

Option	Assessment
1, 1/1A, 1/1B, 2, 2/2A, 2/2B, 2A/2B, 2/2D*, 2A/2D*, 4, 4/4A, 7, 8, 8/8A, 8/8B, 8A/8B, 9, 11, 11C, 12, 13, 15	<p>Options proposed would improve reliability for road users along the A358 corridor</p> <p>Consist of dual carriageway elements with grade-separated junctions</p> <p>Scored 'largely beneficial' as they were anticipated to have more reliable journey times than those with single carriageway elements</p>
2/2D, 2A/2D, 14, 2006-07 Scheme	<p>Include single carriageway elements or require road users to use parts of the existing A358</p> <p>Lower capacity and less reliable journey times when compared to other options</p> <p>Hence assessed to be only 'moderately beneficial'</p>

Reliability – number of incidents

Option	Assessment
4, 4/4A	<p>Connect to the M5 north of Junction 25, were assessed to have only a slight beneficial score</p> <p>Less than desirable minimum weaving length that would be provided between the new M5 junction and the existing junction 25</p> <p>Due to the intermediate junction between the existing A358 and proposed road, traffic flows would be kept relatively high through Henlade and junction 25</p> <p>Hence were assessed to have only a 'slight beneficial' score</p>
11, 11C	<p>Less than desirable spacing between the proposed and existing M5 junctions, similar to Options 4 and 4/4A</p> <p>However, since these options would be entirely offline there would be no intermediate junction between the proposed route and existing A358, so traffic to and from Taunton would be less likely to use the existing A358 through Henlade</p> <p>Hence were judged to be 'moderately beneficial'</p>
1	<p>Entirely offline and would not have a weaving length between successive motorway junctions that is not to current standards</p> <p>Assessed to be 'largely beneficial'</p>
1/1A, 1/1B	<p>Similar to Options 4 and 4/4A, but it was anticipated that road users wishing to access Taunton or travel to and from the M5 north would continue to use the existing A358 resulting in high traffic flows around Henlade and junction 25</p> <p>Options would not incorporate weaving lengths that are not to current standards between successive motorway junctions</p> <p>Assessed to be 'moderately beneficial'</p>

Option	Assessment
2/2B, 2A/2B, 8, 8/8B, 2006-07 Scheme	Use the existing S-bends around the Hatch Beauchamp Bypass Although other elements of these options would comply with design standards, the alignment through these bends would not likely be to current standards Assessed to be 'moderately beneficial'
15	This is the southern-most option Whilst this would be expected to serve traffic to and from the south west well, it was not considered to be a particularly attractive route for traffic to and from Taunton and the North The existing A358 would have been a slightly more attractive route for these journeys than for Option 1 which did not travel as far south Assessed to be 'moderately beneficial'
2, 2/2A, 2/2D, 2/2D*, 2A/2D, 2A/2D*, 7, 8/8A, 8A/8B, 9, 12, 13, 14	All other options were assessed to be 'largely beneficial'

Resilience

Option	Assessment
1, 11, 11C, 12, 15	Fully offline and considered to provide the most resilience as the existing A358 could be retained for non-strategic traffic Therefore scored as 'largely beneficial'
1/1A, 1/1B, 2, 2/2A, 2/2B, 2A/2B, 2/2D*, 2A/2D*, 4, 4/4A, 7, 8, 8/8A, 8/8B, 8A/8B, 9, 13, 2006-07 Scheme	Do not comprise new single carriageway elements Incorporate existing sections of the A358, providing some additional resilience to the road network Hence assessed to be 'moderately beneficial'
2/2D, 2A/2D, 14	Comprise a single carriageway Henlade Bypass Will not significantly improve resilience for road users travelling to and from Taunton or the M5 north. Scored as 'slightly beneficial'

Delivery of housing

Option	Assessment
1, 1/1A, 1/1B, 2, 2/2A, 2/2B, 2/2D, 2/2D*, 2A/2B, 2A/2D, 2A/2D*, 4, 4/4A, 7, 8, 8/8A, 8/8B, 8A/8B, 9, 11, 11C, 12, 13, 14, 15, 2006-07 Scheme	Not expected to directly facilitate the construction of new housing Junctions would not be provided along the alignment and therefore would not open the area to housing developments No housing developments were identified in the local area plans All options were therefore scored 'neutral' for this aspect.

Carbon emissions - Activity

6.3.3. All routes were assessed according to the journey distances they would impose between a point on the A303 Ilminster Bypass and points on the M5 north and south of the scheme limits, and a point on the A358 to the west of junction 25.

Option	Assessment
2, 2/2B, 8/8A, 8A/8B	Options use the central corridor along the existing A358 and include a connection to the M5 at junction 25 Offline route to the north of the village of Rapps Most direct route Judged to be 'largely beneficial'
2/2A, 2A/2B, 8, 8/8B, 13, 2006-07 Scheme	Options use the central corridor along the existing A358 and include a connection to the M5 at junction 25 Follow a more southerly loop close to Southfields Roundabout Judged to be 'moderately beneficial'
12	Provides a direct connection to junction 25 and generally follows a central corridor Assessed to be 'largely beneficial' regarding carbon emissions
1, 1/1A, 1/1B, 4, 4/4A, 15	Tie-in to the M5 to the north or south of Taunton Provide benefit to road users heading to the north or south Increase the distance travelled for a considerable number of road users who travel between Taunton and the east Options therefore considered to be only 'slightly beneficial'
2/2D, 2/2D*, 2A/2D, 2A/2D*, 7, 9, 14, 11, 11C	Reduced vehicle-kilometre travelled, hence anticipated to provide a 'moderately beneficial' change to carbon emissions

Carbon emissions - Embedded carbon

Option	Assessment
1, 1/1A, 1/1B, 2, 2/2A, 2/2B, 2/2D, 2/2D*, 2A/2B, 2A/2D, 2A/2D*, 4, 4/4A, 7, 8, 8/8A, 8/8B, 8A/8B, 9, 11, 11C, 12, 13, 14, 15, 2006-07 Scheme	Due to the nature of the works being proposed, it was anticipated that significant construction work would be required on all options

Carbon emissions - Carbon content

Option	Assessment
1, 1/1A, 1/1B, 2, 2/2A, 2/2B, 2/2D, 2/2D*, 2A/2B, 2A/2D, 2A/2D*, 4, 4/4A, 7, 8, 8/8A, 8/8B, 8A/8B, 9, 11, 11C, 12, 13, 14, 15, 2006-07 Scheme	Once the scheme is completed and operational it was anticipated that there would be a reduction in greenhouse gas emissions as traffic would relocate from the existing A303 and A358 to the new alignment It was therefore concluded that all options were 'neutral' in this respect.

Carbon emissions - Efficiency

Option	Assessment
1, 1/1A, 1/1B, 2, 2/2A, 2/2B, 2A/2B, 2/2D*, 2A/2D*, 4, 4/4A, 7, 8, 8/8A, 8/8B, 8A/8B, 9, 11, 11C, 12, 13, 15, 2006-07 Scheme	Expected to provide high-quality dual carriageway elements with grade-separated junctions, therefore assessed to be 'slightly beneficial' regarding fuel efficiency
2/2D, 2A/2D, 14	Include single carriageway versions of the Henlade Bypass which may be susceptible to congestion Hence allocated a 'neutral' score

Socio-distributional impacts and the region - Regeneration

Option	Assessment
1, 1/1A, 1/1B, 2, 2/2A, 2/2B, 2/2D, 2/2D*, 2A/2B, 2A/2D, 2A/2D*, 4, 4/4A, 7, 8, 8/8A, 8/8B, 8A/8B, 9, 11, 11C, 12, 13, 14, 15, 2006-07 Scheme	No targeted 'Regeneration Areas' were identified within the scheme limits and so all options accordingly a 'neutral' score

Socio-distributional impacts and the region Regional imbalance – in an economically weak region

6.3.4. *The Local Enterprise Partnership Strategic Economic Plan 2014 – 2030* (Heart of the south west – Local Enterprise Partnership, March 2014) identifies the south west of England as having lower wages than the national average and persistent unemployment problems in some areas. Poor transport connectivity has been identified as a barrier to economic growth within the region.

Option	Assessment
4, 4/4A, 11, 11C	Options have a junction with the M5 north of junction 25 are anticipated to have less impact on regional imbalance as they would have slightly greater journey distances and times to and from the south west, therefore assessed to have only a 'slight impact'
1, 1/1A, 1/1B, 2, 2/2A, 2/2B, 2/2D, 2/2D*, 2A/2B, 2A/2D, 2A/2D*, 7, 8, 8/8A, 8/8B, 8A/8B, 9, 12, 13, 14, 15, 2006-07 Scheme	Improve connectivity and positively impact the region in terms of economic growth, reduced congestion and regional imbalance through the reduction in congestion and journey times Judged to have a 'moderately beneficial' impact on regional imbalance

Socio-distributional impacts and the region Regional imbalance – impact on economic growth

Option	Assessment
2/2D, 2A/2D, 14	Options have single carriageway links to junction 25 judged to be 'slightly beneficial' to the area
1, 1/1A, 1/1B, 2, 2/2A, 2/2B, 2A/2B, 2/2D*, 2A/2D*, 4, 4/4A, 7, 8, 8/8A, 8/8B, 8A/8B, 9, 11, 11C, 12, 13, 15, 2006-07 Scheme	Anticipated to provide a 'moderately beneficial' impact to economic growth

Local environment - Air quality

6.3.5. All the options under consideration were expected to improve local air quality to some degree. There would be likely to be a positive impact to many households in the Henlade AQMA as a result of all options under consideration.

Option	Assessment
1/1A, 1/1B	Follow the existing A358 corridor partially and include an intermediate junction between the proposed road and existing A358 The junction would encourage traffic to and from Taunton to continue to use the A358 through Henlade Options therefore judged to have only a 'slightly beneficial' impact on air quality
1	Option is entirely offline Crosses the existing A358 near Hatch Beauchamp but it was considered that there would be no need for an intermediate junction between the two routes at this location Thus traffic to and from Taunton would be less likely to use the A358 through Henlade Assessed to be 'moderately beneficial' in terms of air quality
4, 4/4A	Similar to Options 1/1A and 1/1B as, although they would take the main strategic traffic flows away from Henlade, the existing A358 through the village would still be the main route into and out of Taunton Options were therefore assessed to have only a 'slightly beneficial' impact on air quality
2/2D, 2A/2D, 14	Comprise only single carriageway versions of Henlade Bypass May not reduce congestion in the vicinity of the AQMA as much as the dual carriageway sections, therefore assessed to be only 'slightly beneficial'
15	Option 15 was assessed to be only slightly beneficial in terms of air quality. The southerly alignment was considered to be a relatively unattractive route for journeys to and from Taunton and the north and as such a greater proportion of these journeys would be made via the existing A358 Assessed to be 'slightly beneficial' in terms of air quality
2, 2/2A, 2/2B, 2A/2B, 2/2D*, 2A/2D*, 7, 8, 8/8A, 8/8B, 8A/8B, 9, 11, 11C, 12, 13, 2006-07 Scheme	Removes traffic from the existing A358 through Henlade, therefore considered to have a 'moderately beneficial' improvement on air quality

Local environment - Noise

6.3.6. The assessment of noise impact of the options being proposed took into account the likely existing noise conditions and the likely effect on any tranquil locations.

Option	Assessment
4, 4/4A	Options are anticipated to increase noise levels in the settlement of Creech St. Michael so judges to have a 'slightly adverse' impact on noise conditions
13	Removes traffic from the centre of Henlade and incorporate a southern alignment towards the southern scheme extents, minimising new noise disturbance to properties in the vicinity of Rapps and Ilton Judged to have a 'moderately beneficial' impact on noise
8, 8/8B	Follows a southerly looped alignment close to Southfields Roundabout Removes traffic from the centre of Henlade and minimises new noise disturbance to properties in the vicinity of Rapps and Ilton, therefore considered to be 'moderately beneficial'

Option	Assessment
8/8A, 8A/8B	Options take a more direct line towards the southern scheme extents Removes traffic from the NIA at Henlade and Henlade itself, but introduces new noise sources in the vicinity of Rapps and Ilton Assessed to be 'slightly beneficial'
14	Removes traffic away from the Noise Important Areas in Henlade as a result of bypassing the village However, the route to and from the M5 would introduce new noise sources to the area Overall assessed to be 'neutral'
15	One of the longest routes Anticipated to remove most of the strategic traffic from the existing A358 and communities adjacent to it However, due to its length, the amount of disturbance to the tranquil setting was expected to be high therefore judged to have a 'slightly adverse' impact regarding noise disturbance
2, 2/2B, 2/2D, 2/2D*	Options take a direct offline route close to the village of Rapps Follow a route much closer to Henlade therefore reducing the magnitude of the anticipated benefits Judged to have a 'neutral' impact regarding noise disturbance
2/2A, 2A/2B, 2A/2D, 2A/2D*	Options follow a southerly route close to Southfields Roundabout, thus avoiding Rapps Follow a route much closer to Henlade therefore reducing the magnitude of the anticipated benefits Judged to have a 'slightly beneficial' impact regarding noise disturbance
2006-07 Scheme	Has a similar alignment to that of Option 2A/2B and scored 'slightly beneficial'
1, 1/1A, 1/1B, 7, 9, 11, 11C, 12	Judged to have a 'neutral' impact regarding noise disturbance

Local environment - Natural environment, heritage and landscape

Option	Assessment
1, 1/1A, 1/1B	Alignments run in proximity to the Blackdown Hills Area of Outstanding Natural Beauty, therefore judged to have a 'moderately adverse' impact on the natural environment
15	Passes close to the AONB and would also pass close to Thurlbear Wood and Quarrylands SSSI, Barrington Hill Meadows SSSI as well as the multitude of floodplains that are present in the area. Therefore, judged to have a 'moderately adverse' impact on the natural environment
14	Alignment would pass close to the Thurlbear Wood and Quarrylands SSSI, therefore judged to have a 'slightly adverse' impact on the natural environment
11, 11C, 12	Interact with floodplains, the Wrantage Covert Ancient Woodland and Curry Ridge, which are considered highly valuable and sensitive environmental assets, therefore considered to have a 'moderately adverse' impact
4, 4/4A	Interact with floodplains and the Wrantage Covert Ancient Woodland, which are considered highly valuable and sensitive environmental assets, therefore considered to have a 'slightly adverse' impact

Option	Assessment
2, 2/2B, 2/2D, 2/2D*, 8/8A, 8A/8B	Options follow a direct corridor between the B3168 overbridge at the southern extents and the A358 near Ashill (passing close to the village of Rapps and just to the south of Ilton) pass through currently undeveloped rural land. Considered to have a 'slightly adverse' impact
2/2A, 2A/2B, 2A/2D 2A/2D*, 7, 8, 8/8B, 9, 13, 2006-07 Scheme	Considered to have a 'neutral impact' on the natural environment

Local environment - Improve streetscape and urban environment

Option	Assessment
1/1A, 1/1B, 4, 4A, 14, 15	Comprise a new junction either to the north or south of the existing junction 25 Involve online widening of the existing A358, meaning that an intermediate junction would be required Traffic travelling to and from Taunton would therefore still be likely to pass through Henlade These options were therefore judged to have only a 'slightly beneficial' impact on the urban environment
1, 11, 11C	Options also involve the provision of a new junction on the M5 in similar locations to Options 1/1A, 1/1B, 4, 4A, 14 and 15 All options entirely offline and therefore would not include an intermediate junction Traffic to and from Taunton would be less likely to travel along the existing A358 through Henlade Judged to be 'moderately beneficial' to the urban environment
2006-07 Scheme	Incorporates a link taking all through-traffic out of Henlade village centre Requires the acquisition of the existing playing fields at Blackbrook to the west of the M5 to construct a new junction Assessed to have only a 'slightly beneficial' impact on the urban environment
2, 2/2A, 2/2B, 2/2D, 2/2D*, 2A/2B, 2A/2D, 2A/2D*, 7, 8, 8/8A, 8/8B, 8A/8B, 9, 12, 13	Anticipated to have a 'moderately beneficial' impact on the urban environment

Wellbeing - Severance

Option	Assessment
4, 4/4A	The proposed alignments would sever the communities of Creech St. Michael and Creech Heathfield Some relief from severance in Henlade as some strategic traffic would be removed from the village. It was anticipated that these options would have a 'neutral effect' on severance

Option	Assessment
11, 11C	Options share the same northern M5 junction location as Options 4 and 4/4A It is anticipated that traffic through Henlade would be lower than Options 4 and 4/4A due to Options 11 and 11C are entirely offline No intermediate junction between the proposed road and the existing A358 Traffic to and from Taunton would therefore be less likely to use the existing A358 through Henlade. Options assessed to be 'slightly beneficial'
1/1A, 1/1B	Due to the requirement for an intermediate junction, the existing A358 would still be a relatively attractive route for journeys to and from Taunton This would retain some degree of severance at Henlade The options were assessed as being 'slightly beneficial' regarding the aspect of severance.
1	No intermediate junction between the existing A358 and the proposed route is proposed This results in relatively low levels of traffic to and from Taunton travelling along the existing A358 The option is therefore considered to be 'moderately beneficial' in terms of severance
15	This is the southern-most route Whilst this would serve traffic to and from the south west well, it would not be a particularly attractive route for traffic to and from Taunton and the north It was considered that the existing A358 would have been a slightly more attractive route for these journeys than for Option 1 which did not travel as far south. Judged to be only 'slightly beneficial' in addressing severance
2/2D, 2A/2D, 14	Include a single carriageway Henlade Bypass is unlikely to provide significant relief of congestion May result in traffic 'rat running' through the village centre. Judged to be only 'slightly beneficial'
2, 2/2A, 2/2B, 2A/2B, 2/2D*, 2A/2D*, 7, 8, 8/8A, 8/8B, 8A/8B, 9, 12, 13, 2006-07 Scheme	All other options were scored as moderately beneficial due to their anticipated removal of traffic from Henlade village.

Wellbeing - Injury or deaths

Option	Assessment
2/2B, 2A/2B, 8/8B, 8A/8B, 2006-07 Scheme, 15	Involve retention of the Hatch Beauchamp Bypass 'S' bends The alignment of these bends is not likely to be to current standards and will require technical approval. Options therefore assessed as 'neutral'
1/1A, 1/1B	Does not directly make use of the S-bends but the existing route would be a more attractive route for traffic to and from Taunton and the north This would result in a significant proportion of traffic using the existing lower standard route These options were therefore assessed as 'neutral'

Option	Assessment
4, 4/4A	Options would include spacing not to current standard between the proposed M5 junction and the existing junction 25 Involve a significant proportion of traffic to and from Taunton travelling through Henlade as a result of the provision of an intermediate junction between the proposed route and existing A358 which would make the existing A358 a more attractive route than with other options These options were therefore assessed as 'neutral'
11, 11C	Include a new junction on the M5 at the same location as Options 4 and 4/4A Options 11, 11C would be entirely offline. As such the existing A358 through Henlade would be a less attractive route to Taunton than it might be for Options 4 and 4/4A, due to the lack of an intermediate junction These options were therefore assessed as 'slightly beneficial'
1, 2, 2/2A, 2/2D, 2/2D*, 2A/2D, 2A/2D*, 7, 8, 8/8A, 9, 12, 13, 14	Assessed to have a 'slightly beneficial' impact on road injuries/deaths.

Wellbeing - Crime

Option	Assessment
1, 1/1A, 1/1B, 2, 2/2A, 2/2B, 2/2D, 2/2D*, 2A/2B, 2A/2D, 2A/2D*, 4, 4/4A, 7, 8, 8/8A, 8/8B, 8A/8B, 9, 11, 11C, 12, 13, 14, 15, 2006-07 Scheme	At this stage it was difficult to determine what impact the options under consideration would have on crime or public fear of crime All options received a 'neutral' score

Wellbeing - Enjoying access to a range of goods, services and places

6.3.7. When assessing the options against connectivity, a combination of each route's overall length as well as the distance to the north, south and Taunton have been considered.

Option	Assessment
1, 1/1A, 1/1B, 15	Provides the most direct options to the south west but are relatively long and would increase journey times for road users wishing to access Taunton or use the M5 northbound Judged to be 'slightly beneficial'
2, 2/2A, 2/2B, 7, 8/8A, 8A/8B	Options which would closely follow the existing A358 corridor but would cut the corner south of Ilton provide a more direct route to and from Taunton while conversely providing slightly longer journeys to the north and south were considered as 'largely beneficial' overall.
2A/2B, 8, 8/8B, 9, 13	Options which would follow the existing A358 but would follow the existing alignment in the vicinity of Southfields Roundabout would be slightly longer and were therefore considered as 'moderately beneficial' to road users.
2/2D, 2A/2D, 14	Option 14 and the first pair of variants of Options 2/2D, 2A/2D would provide a new single carriageway link to junction 25 which would be more susceptible to congestion during peak times They were therefore considered to be 'slightly beneficial' to road users
2/2D*, 2A/2D*	The second pair of variants of Options 2/2D, 2A/2D with the dual carriageway link to junction 25 would be less susceptible to congestion during peak times They were therefore considered to be 'largely beneficial' to road users

Option	Assessment
4, 4/4A, 11, 11C	Options 4, 4/4A, 11 and 11C would be beneficial for road users wishing to continue north along the M5 but would increase journey times to the south. These options are slightly longer than those found along the existing A358. Due to the difference in lengths, Options 4, 4/4A were judged to be 'slightly beneficial' and Options 11, 11C were judged to be 'moderately beneficial'
12, 2006-07 Scheme	The remaining Options were all judged to be 'slightly beneficial'

Wellbeing - Improve access to key locations

Option	Assessment
1, 1/1A, 1/1B, 2, 2/2A, 2/2B, 2/2D, 2/2D*, 2A/2B, 2A/2D, 2A/2D*, 4, 4/4A, 7, 8, 8/8A, 8/8B, 8A/8B, 9, 11, 11C, 12, 13, 14, 15, 2006-07 Scheme	Evaluation of how each option would alter the ability of nearby residents to access key locations such as hospitals, schools, supermarkets, and employment locations All options were considered to have a 'slightly' beneficial impact on the ability to access key locations due to increase connectivity within the region and improved journey times and reliability.

Wellbeing - Impact on day to day variability

Option	Assessment
2/2D, 2A/2D, 14	Provide only single carriageway elements and/or make use of the existing A358 through Henlade Hence less reliable than the other options and scored as 'moderately' beneficial
1, 1/1A, 1/1B, 2, 2/2A, 2/2B, 2A/2B, 2/2D*, 2A/2D*, 4, 4/4A, 7, 8, 8/8A, 8/8B, 8A/8B, 9, 11, 11C, 12, 13, 15, 2006-07 Scheme	No single carriageway elements and do not make use of the existing A358 through Henlade Hence scored as 'largely' beneficial to road users.

Wellbeing - Change in number of incidents

Option	Assessment
4 and 4/4A	'Slight' benefits to road users, due to the distance that is not to current standards between the new M5 junction provided for these options and the existing junction 25. A sub-standard distance between junctions could lead to an increase in weaving-related incidents on the M5. Options would also require journeys to and from Taunton to continue along the existing A358 through Henlade with a likelihood that existing congestion around junction 25 would prevail, with no subsequent decrease in congestion-related incidents such as shunts
1/1A and 1/1B	Options are considered likely to result in high traffic flows along the existing A358 to and from Taunton However, would provide adequate weaving length between their proposed tie-in with the M5 and junction 25 Judged to be 'moderately' beneficial as a result.

Option	Assessment
11 and 11C	<p>Would include a new junction on the M5 which, similar to Options 4 and 4/4A, would be a distance that is not to current standards from junction 25</p> <p>However, these options would be entirely offline</p> <p>The existing A358 through Henlade would therefore be less attractive as a route to and from Taunton due to the lack of an intermediate junction</p> <p>Options 11 and 11C were therefore assessed to be 'moderately' beneficial.</p>
2/2A, 2/2B, 2A/2B, 8/8B, 8A/8B and the 2006-07 Scheme	<p>Use the existing S-bend around Hatch Beauchamp</p> <p>As the existing alignment is not to current standards, the proposed alignment would require technical approval.</p> <p>Assessed to be 'moderately' beneficial</p>
15	<p>This is the most southerly route in the sift and would be entirely offline</p> <p>With this option, it was considered that the existing A358 would be the preferred route for people travelling to and from Taunton and the north</p> <p>This would lead to a significant proportion of traffic travelling along the lower standard existing route through the village of Henlade as is the current situation</p> <p>Judged to have only a 'moderately' beneficial influence on the number of incidents.</p>
1, 2, 2/2D, 2/2D*, 2A/2D, 2A/2D*, 7, 8, 8/8A, 9, 12, 13, 14	<p>All assessed to be 'largely' beneficial</p> <p>Each provides an alignment fully compliant with standards</p> <p>Attracts traffic away from existing congested routes that are not to current standards.</p>

Expected Value for Money Category

Option	Assessment
1, 1/1A, 1/1B, 2, 2/2A, 2/2B, 2/2D, 2/2D*, 2A/2B, 2A/2D, 2A/2D*, 4, 4/4A, 7, 8, 8/8A, 8/8B, 8A/8B, 9, 11, 11C, 12, 13, 14, 15, 2006-07 Scheme	<p>Expected that all options would have significant benefits.</p> <p>The scheme options were in the early stages of development, and were not costed prior to the sift.</p> <p>It was therefore not possible to calculate Value for Money for individual options.</p>

Managerial

Implementation timetable

Option	Assessment
1, 1/1A, 1/1B, 2, 2/2A, 2/2B, 2/2D, 2/2D*, 2A/2B, 2A/2D, 2A/2D*, 4, 4/4A, 7, 8, 8/8A, 8/8B, 8A/8B, 9, 11, 11C, 12, 13, 14, 15, 2006-07 Scheme	<p>It was considered that all options under consideration were deliverable within similar timescales.</p>

Public acceptability

Option	Assessment
4, 4/4A, 11, 11C, 12	Public acceptability questions in relation to the options; <ul style="list-style-type: none"> - passing close to the settlement of Creech St. Michael - having potential detrimental impacts on prominent landforms at Curry Ridge and the Wrantage Escarpment.
1, 1/1A, 1/1B, 15	Public acceptability questions in relation to the options; <ul style="list-style-type: none"> - requiring significant amounts of undeveloped rural land for construction - passing close to the Blackdown Hills AONB.
2, 2/2A, 2A/2B, 2/2D, 2/2D*, 2A/2D, 2A/2D*, 8, 8/8A, 8A/8B, 8/8B,	Public acceptability questions in relation to the options; <ul style="list-style-type: none"> - dissecting land set aside for a major employment centre, limiting future job creation in this location.
2006-07 Scheme	When this option was previously taken to Public Consultation concerns were raised about the proposals affecting local playing fields at Blackbrook for the new M5 junction.
7, 9, 12, 13, 14	Fewer more-widely identifiable public acceptability issues.

Practical feasibility

Option	Assessment
1, 11, 11C, 12, 15	Practical feasibility was judged to be 'good' because all these options should be relatively straightforward to construct. Their proposed alignments would be fully offline and could be built without significantly affecting the existing A358.
7 and 9	Incorporate free flowing slip roads with the M5 Judged to have only 'slight' practical feasibility as these links would be constructed through the proposed development at junction 25 Would be required to be built over existing development and infrastructure links including the M5 Motorway, junction 25 and associated slip roads.
1/1A, 1/1B, 2, 2/2A, 2/2B, 2A/2B, 2/2D, 2/2D*, 2A/2D, 2A/2D*, 4, 4/4A, 8, 8/8A, 8A/8B, 8/8B, 13, 14, 2006-07 Scheme	Average difficulty to construct and were therefore assessed to have 'medium' practical feasibility.

Quality of the supporting evidence

- 6.3.8. The 2006-07 Scheme had a 'good' level of supporting evidence from the work that was undertaken during its development.
- 6.3.9. Other options being assessed broadly followed the same concept as the 2006-07 Scheme although they had not been developed in as much detail. As such all other options were judged to be backed up by a 'reasonable' level of supporting evidence.

Financial

Affordability

- 6.3.10. The sifting process was undertaken without scheme costs having been estimated for comparing the options. At this stage, it was considered that all the sifted options would be broadly affordable.

Capital costs

- 6.3.11. The scheme budget had a range of £250 - £500 million. All current options were assumed to fall into that range of capital costs.

Overall cost risk

- 6.3.12. At this stage in the development of the scheme it was not possible to make a distinction between route options in terms of cost risk. The options were considered to be representative of a major infrastructure project and were therefore judged to have similar and normal cost risks for such a project.

Commercial

Option flexibility

- 6.3.13. All options proposed would comprise a new dual carriageway link between the A303 and the M5 south and would either be compliant with technical design standards, or would have technical approval in place for non-compliant elements. The length of the scheme and the prevalence of local roads would provide flexibility in the location and frequency of junctions.
- 6.3.14. The area between Southfields Roundabout and the M5 is generally rural and sparsely populated with only a few settlements. This should provide flexibility for amendments of the alignment and provision of connecting parallel local roads where junctions are not provided.
- 6.3.15. However, there are several important statutory and environmental constraints present that would limit flexibility in certain locations. As such a score of 4/5 was allocated to all options regarding flexibility.

Sources of funding

- 6.3.16. The A358 Taunton to Southfields Roundabout Scheme is being funded as part of the Road Investment Strategy. Funding is provided via the Department for Transport, i.e. it would be publicly funded.

Income generation

6.3.17. There is no intention to toll any section of the route. For this reason, this criterion has not been scored.

Results of the phase 2 sift

6.3.18. The results of the phase 2 sift are shown in Table 6.3. At the end of this phase, there was a fairly broad spread of results but with only 14 points between the top 12 options.

Table 6.3: Results of the phase 2 sift

Option	Score after phase 2	Rank after phase 2
Option 8/8A	154	1
Option 2	153	2
Option 2/2D (with dual carriageway Henlade Bypass)	152	3
Option 13	151	4=
Option 8	151	4=
Option 12	151	4=
Option 8A/8B	148	7
Option 2/2B	147	8
Option 2/2A	146	9
Option 2A/2D (with dual carriageway Henlade Bypass)	145	10=
Option 7	145	10=
Option 9	143	12
Option 8/8B	141	13
Option 2A/2B	140	14
Option 1	133	15
Option 11	132	16=
Option 11C	132	16=
2006-07 Scheme	129	18
Option 1/1A	122	19=
Option 1/1B	122	19=
Option 15	122	19=
Option 2A/2D (with single carriageway Henlade Bypass)	120	22
Option 2/2D (with single carriageway Henlade Bypass)	119	23
Option 14	116	24
Option 4	112	25=
Option 4/4A	112	25=

Table 6.4: Phase 2 sift matrix

			1	1/1A	1/1B	2	2/2A	2/2B	2A/2B	2/2D	2/2D(*)	2A/2D	2A/2D(*)	4	4/4A	7	8	8/8A	8/8B	8A/8B	9	11	11C	12D	2006-07 scheme	13	14	15			
Economic	Economic growth	Connectivity	Impact on end-to-end journey time	1	1	1	3	2	3	2	1	3	1	2	1	1	3	2	3	2	3	2	2	2	3	2	2	1	1		
			Impact on the cost of travel (vehicle operating costs, fares etc.)	1	1	1	3	2	3	2	1	3	1	2	1	1	3	2	3	2	3	2	3	2	2	2	3	2	2	1	1
		Reliability	Impact on variability of day-to-day journey times	3	3	3	3	3	3	3	2	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	2	3	
			Number of incidents	3	2	2	3	3	2	2	3	3	3	3	1	1	3	3	3	2	2	3	2	2	3	2	3	3	2	3	
		Resilience			3	2	2	2	2	2	2	1	2	1	2	2	2	2	2	2	2	2	2	3	3	3	2	2	1	3	
		Delivery of housing			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Carbon emissions	Activity			1	1	1	3	2	3	2	2	3	2	2	1	1	3	2	3	2	3	2	2	2	3	2	2	2	1	
		Embedded carbon			-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
		Carbon content			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		Efficiency			1	1	1	1	1	1	1	0	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	
	Socio-distributional impacts and the region	Regeneration			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		Regional imbalance	In an economically weak region		2	2	2	2	2	2	2	2	2	2	2	1	1	2	2	2	2	2	2	1	1	2	2	2	2	2	
			Impact on economic growth		2	2	2	2	2	2	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	1	2	1	2	
	Local environment	Air quality	Impact on local air quality		2	1	1	2	2	2	2	1	2	1	2	1	1	2	2	2	2	2	2	2	2	2	2	2	1	1	
			AQMA affected		2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
		Noise	Reduce absolute disturbance from noise		0	0	0	0	1	0	1	0	0	0	1	-1	-1	0	2	1	2	1	2	0	0	0	1	2	0	-1	
			Does it affect a problem area		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		Natural environment, heritage and landscape	Impact on natural and urban environment		-2	-2	-2	-1	0	-1	0	-1	-1	0	0	-1	-1	-1	0	-1	0	-1	0	-2	-2	-2	0	0	-1	-2	
			Value of the environment affected		-1	-1	-1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-1	-1	-1	0	0	0	-1
		Improve streetscape and urban environment			2	1	1	2	2	2	2	1	2	1	2	1	1	2	2	2	2	2	2	2	2	2	1	2	1	1	
	Wellbeing	Severance			2	1	1	2	2	2	2	1	2	1	2	0	0	2	2	2	2	2	2	1	1	2	2	2	1	1	
		Injury or deaths	Numerical impact on KSIs		1	0	0	1	1	0	0	1	1	1	1	0	0	1	1	1	0	0	1	1	1	1	0	1	1	0	
			Impact on risk of travelling (KSIs / km)		1	0	0	1	1	0	0	1	1	1	1	0	0	1	1	1	0	0	1	1	1	1	0	1	1	0	
		Crime			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		Access to a range of goods, services and places	Impact on end-to-end journey time			1	1	1	3	2	3	2	1	3	1	2	1	1	3	2	3	2	3	2	2	2	3	2	2	1	1
			Impact on the cost of travel (vehicle operating costs, fares etc.)			1	1	1	3	2	3	2	1	3	1	2	1	1	3	2	3	2	3	2	2	2	3	2	2	1	1
			Improve access to key locations			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Impact on day to day variability			3	3	3	3	3	3	3	2	3	2	3	3	3	3	3	3	3	3	3	3	3	3	2	3	2	3
	Change in number of incidents			3	2	2	3	3	2	2	3	3	3	3	1	1	3	3	3	2	2	3	2	2	3	2	3	3	2		
	Expected Value for Money Category			5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	

		1	1/1A	1/1B	2	2/2A	2/2B	2A/2B	2/2D	2/2D(*)	2A/2D	2A/2D(*)	4	4/4A	7	8	8/8A	8/8B	8A/8B	9	11	11C	12D	AS	13	14	15
Managerial	Implementation timetable	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Public acceptability	2	2	2	3	3	3	3	3	3	3	3	2	2	2	3	3	3	3	2	2	2	2	2	3	3	2
	Practical feasibility	4	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	3	3	2	4	4	4	3	3	3	4
	Quality of the supporting evidence	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	4	3	3	3
Financial	Affordability	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Capital costs	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Overall cost risk	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Commercial	Option flexibility	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
	Sources of funding																										
	Income generation																										

6.4. Development and assessment of options

- 6.4.1. The best performing options from the phase 2 sift were options 8/8A (ranked 1), option 2 (ranked 2), option 2/2D with the dual carriageway Henlade Bypass (ranked 3) and options 8, 12 and 13 (ranked =4). It was observed that the top scoring options (with the exception of option 12) were all similar in nature in that they followed a central corridor, connecting to the M5 (north) and Taunton via a direct link to junction 25 and to the M5 (south) via free-flowing slip roads. Option 12 follows the northern corridor for part of the route, but uses the central corridor as it nears Taunton, again connecting to the M5 (north) and Taunton via a direct link to junction 25 and to the M5 (south) via free-flowing slip roads.
- 6.4.2. For the further, more detailed assessment of the better-performing options, it was judged that there are important elements to the scheme that should be included (see Table 6.5) and considered by the selected shortlisted options to be taken forward for more detailed assessment (see Table 6.6 and Table 6.7).

Table 6.5: Important features to be included in the shortlist

Feature	Why was this considered important
Fully offline route	This would ensure that an option is considered that facilitates simple construction
Southern loop	This would lie roughly within the existing road corridor, and provide an opportunity for re-use of the existing A358 corridor which is considered to comprise a suitable alignment for online widening.
Cross country at Rapps	This is considered to comprise a high speed, direct route.
Retention of Ashill Bypass	This would lie roughly within the existing road corridor, and provide an opportunity for re-use of the existing A358 corridor which is considered to comprise a suitable alignment for online widening.
Retention of Hatch Beauchamp Bypass	This would lie roughly within the existing road corridor, and provide an opportunity for re-use of the existing A358 corridor which is considered to comprise a suitable alignment for online widening. This would also provide the opportunity for retention of large bridge crossing (Griffin Lane)
A way of connecting to the M5 (all movements) that does not require the use of Junction 25	This would ensure an option is considered in the shortlist that enables all traffic travelling between the new scheme and M5 Motorway to be directed away from Junction 25
A separate Henlade Bypass	This would provide a way of managing all traffic travelling between the new scheme and M5 Motorway and local traffic separately
Route that passes through Stoke Road, Henlade	Route passes in a cutting reducing visual intrusion and noise effects
A route that passes south of Stoke Road, Henlade	This would provide the opportunity to explore a corridor away from the Air Quality Management Area (AQMA) through Henlade

- 6.4.3. Four options were selected from the ranked list, starting from the top, such that these important elements were contained within at least 1 option. The assessment undertaken on all options is documented in Table 6.6.

Table 6.6: Assessment matrix for important feature

Route Option	Score after sift	Rank after sift	Fully offline	Southern loop	Cross country at Rapps	Retention of Ashill Bypass	Retention of Hatch Beauchamp Bypass	A way of connecting to the M5 (all movements) that does not require the use of junction 25	A separate Henlade Bypass	Route that passes through Stoke Road, Henlade	Route that passes south of Stoke Road, Henlade
Option 8/8A	154	1			x	x					x
Option 2	153	2			x	x				x	
Option 2/2D (Dual carriageway "Henlade bypass")	152	3			x				x	x	
Option 8	151	4=		x		x					x
Option 12	151	4=	x								x
Option 13	151	4=		x		x					x
Option 8A/8B	148	7			x		x				x
Option 2/2B	147	8			x	x	x			x	
Option 2/2A	146	9		x		x				x	
Option 2A/2D (Dual carriageway "Henlade bypass")	145	10=			x	x			x	x	x
Option 7	145	10=			x	x		x		x	
Option 9	143	12		x		x		x			x
Option 8/8B	141	13		x		x	x				x
Option 2A/2B	140	14		x		x	x			x	
Option 1	133	15	x					x			
Option 11	132	16=	x					x			
Option 11C	132	16=	x					x			
2006 - 07 Scheme	129	18		x		x	x			x	
Option 1/1A	122	19=			x	x		x			
Option 1/1B	122	19=		x		x		x			
Option 15	122	19=		x				x			
Option 2A/2D (Single carriageway "Henlade Bypass")	120	22		x		x			x	x	x
Option 2/2D (Single carriageway "Henlade Bypass")	119	23			x	x			x	x	x
Option 14	116	24		x		x		x			
Option 4	112	25=			x	x		x			
Option 4/4A	112	25=		x		x		x			

-
- 6.4.4. The resulting shortlist comprised Options 1, 2/2D, 8A/8B and 13 which were ranked 15, 3, 7 and 4 in the phase 2 sift.
- 6.4.5. Option 1 was recommended to be taken forward as it was the highest scoring route that did not require a connection to Junction 25 and therefore was considered a viable option on which the project team should consult. Option 7 was considered at this stage as it does not require a direct connection to junction 25, although the slip roads for the proposed M5 connection would have required the acquisition of a substantial amount of land associated with the proposed Nexus 25 employment site. For this reason, option 7 was discounted. Option 12 was considered as it is also predominantly offline but connects into junction 25 and was therefore was discounted in favour of Option 1. There is potentially a significant amount of construction envisaged at Junction 25 to accommodate the M5 north bound movement without causing unacceptable delay, and it was therefore considered prudent to include an option that avoided such works in the shortlist.
- 6.4.6. Option 2/2D with a dual carriageway bypass to Henlade was recommended to be taken forward as it was the highest scoring option that comprises the separate Henlade Bypass. There are only 2 points between Option 2/2D and the highest scoring option.
- 6.4.7. There are a number of variants of Option 2 and Option 8. All these variants are similar, the key differences in either case are the nature of the connection with the A303 (ie an alignment north or south of Rapps) and the alignment of the route prior to splitting north and south at Henlade (ie passing through Stoke Road or passing to the south of it). Of all the Option 2 and 8 variants, Option 8A/8B was recommended to be taken forward for public consultation as it best complimented Option 2/2D in covering as many of the key features as possible.
- 6.4.8. Option 13 was recommended to be taken forward as it complemented Options 1, 2/2D and 8A/8B by providing the remaining key features. Option 8 would have provided a similar fit, although Option 13 provided an alternative route to the south of the village of West Hatch. Versions of Option 2 and Option 8, modified to provide free flowing north and south facing slip roads both scored highly in the sift but were not considered deliverable as they inhibit access to the committed strategic development adjacent to junction 25, and also sanitise large parts of it. There were insufficient specific questions in the sifting process to discount these options in their entirety.
- 6.4.9. The key elements found within each shortlisted option are summarised in Table 6.7.

Table 6.7: Shortlisted Options

Element	1	2/2D	8A/8B	13
Fully Off-line	✓			
Southern Loop				✓
Cross Country at Rapps		✓	✓	
Retention of Ashill Bypass				✓
Retention of Hatch Beauchamp Bypass			✓	
A way of connecting to the M5 (all movements) that does not require the use of junction 25	✓			
A separate Henlade Bypass		✓		
Route that passes through Stoke Road, Henlade		✓		
A route that passes south of Stoke Road, Henlade			✓	✓

Initial Stage 1 Assessment of the shortlisted routes

6.4.10. During the initial part of Stage 1 the following exercises were undertaken using each of the four shortlisted options:

- Production of option estimates
- Liaison with key stakeholders regarding each of the route options.

6.4.11. Outcomes from these exercises prompted a review and refinement of the options under consideration to ensure that they met value for money and deliverability objectives for the scheme prior to undertaking further detailed Stage 1 assessment and reporting work. The approach taken is discussed in the following sections.

Production of Options Estimates

6.4.12. Cost estimates were prepared by Highways England Commercial Services for each of the shortlisted options. The cost estimates for each option are summarised in Table 6.8.

Table 6.8: Options estimates for the initial four shortlisted options

Option	Out-turn Cost Estimate
1	£462m
2/2D	£526m
8A/8B	£505m
13	£512m

6.4.13. These estimates were significantly higher than those prepared for the Strategic Outline Business Case and for the strategy, shaping and prioritisation stage (Stage 0) Order of Magnitude Estimate (OME). A review was therefore undertaken to identify rationalisations that could be introduced to the options without compromising the scheme objectives.

6.4.14. This review concluded with the following observations.

- All options included a free-flowing connection to the A303 Ilminster Bypass and associated grade separation of the junction at Southfields Roundabout. This element of the scheme was estimated to account for approximately £50m of the estimated out-turn cost and, whilst it did make a contribution to the realisation of benefits to the scheme, its inclusion was not essential to fulfilment of the RIS objectives as grade separation of the Southfields Roundabout could be included in the subsequent scheme to upgrade the Ilminster Bypass to dual carriageway.
- The use of the Hatch Beauchamp Bypass presents significant opportunities for minimising environmental impact, waste, disruption during construction and cost. Whilst the alignment of the existing bypass does not meet current geometric standards for new dual carriageways, it is considered that there is sufficient justification for adoption of this alignment into the scheme. Technical approval for this approach was obtained by Parsons Brinkerhoff for the previous announced scheme, and this will be applied for in later stages or potentially designed out if benefits described above can be maintained.
- The expense of a separate Henlade Bypass (as in Option 2/2D) was agreed to be excessive and not essential for compliance with the Road Investment Strategy.
- An option that generally followed the alignment of the Henlade Bypass was agreed to be beneficial as it enabled travel between the new road and the existing A378 junction at Mattock's Tree Green, an element that was known to be important in maximising removal of traffic from the centre of Henlade.
- Estimates for each of the four options included for the retention of all transverse local roads and accesses through the provision of over bridges or underbridges to reflect the anticipated expressway core requirement to maximise opportunities for community enhancement. However, as these core requirements were not yet mandated to design teams it was considered that some degree of rationalisation could be applied where two or more crossings were located in close proximity and could be linked on both sides of the proposed road.
- Estimates for each of the four options included for the provision of parallel local roads to reflect the anticipated expressway core requirement to prohibit slow moving vehicles from the dual carriageway. However, as these core requirements were not yet mandated to design teams it was agreed that parallel local roads were not essential to achieve compliance with the Road Investment Strategy.

6.4.15. On the basis of these observations refinements were therefore made to Options 1, 2/2D and 8A/8B as listed in Table 6.9.

Table 6.9: Refinements made to the shortlisted options

Option	Refinements
All options	<ul style="list-style-type: none"> • Direct connection at Southfields Roundabout rather than free flowing connection to the A303 Ilminster Bypass. • Online widening of A358 between Southfields Roundabout and Capland throughout rather than a northern offline section.
Option 1	<ul style="list-style-type: none"> • Rationalisation of transverse local road and access connections along the offline section between Capland and the proposed M5 junction.
Options 2/2D and 8A/8B	<ul style="list-style-type: none"> • Incorporation of the Hatch Beauchamp Bypass as one of the carriageways in the dual carriageway. This would include the retention of the existing Griffin Lane Underbridge for use with that carriageway. • Rationalisation of transverse local roads and accesses, particularly in the vicinity of Haydon.
Option 2/2D	<ul style="list-style-type: none"> • Deletion of the separate Henlade Bypass, and re-alignment of the mainline northwards so that it would follow the line of the Henlade Bypass, thus retaining the potential to intercept traffic to and from the A378.

6.4.16. It was noted that, if the refinements in Table 6.9 had been applied to Option 13 it would no longer have been fundamentally different to Option 8A/8B. As such Option 13 was discounted from this stage onwards in order that two identical solutions were not progressed.

Liaison with Key Stakeholders

6.4.17. The shortlisted options were discussed with key stakeholders to gain views on each option. Significant concern was expressed over the proximity of Option 1 to Blackdown Hills Area of Outstanding Natural Beauty. However, Option 1 was important because, of the 4 shortlisted options, it uniquely included an entirely new junction on the M5.

6.4.18. Early consultation on the shortlisted options was held with key stakeholders to establish the overall perception of each option and if there were any significant risks to deliverability of one or more of the options. During this process significant concern was expressed over the proximity of Option 1 to the boundary of the Blackdown Hills Area of Outstanding Natural Beauty. Option 1 was particularly important to Highways England at this stage of the process because it uniquely comprised an entirely new junction on the M5 and so it was agreed, at that point, to continue evaluating it. However, it was also decided that, should Option 1 become un-deliverable due to environmental concerns, an alternative should be found that allowed the continued consideration of a new junction on the M5.

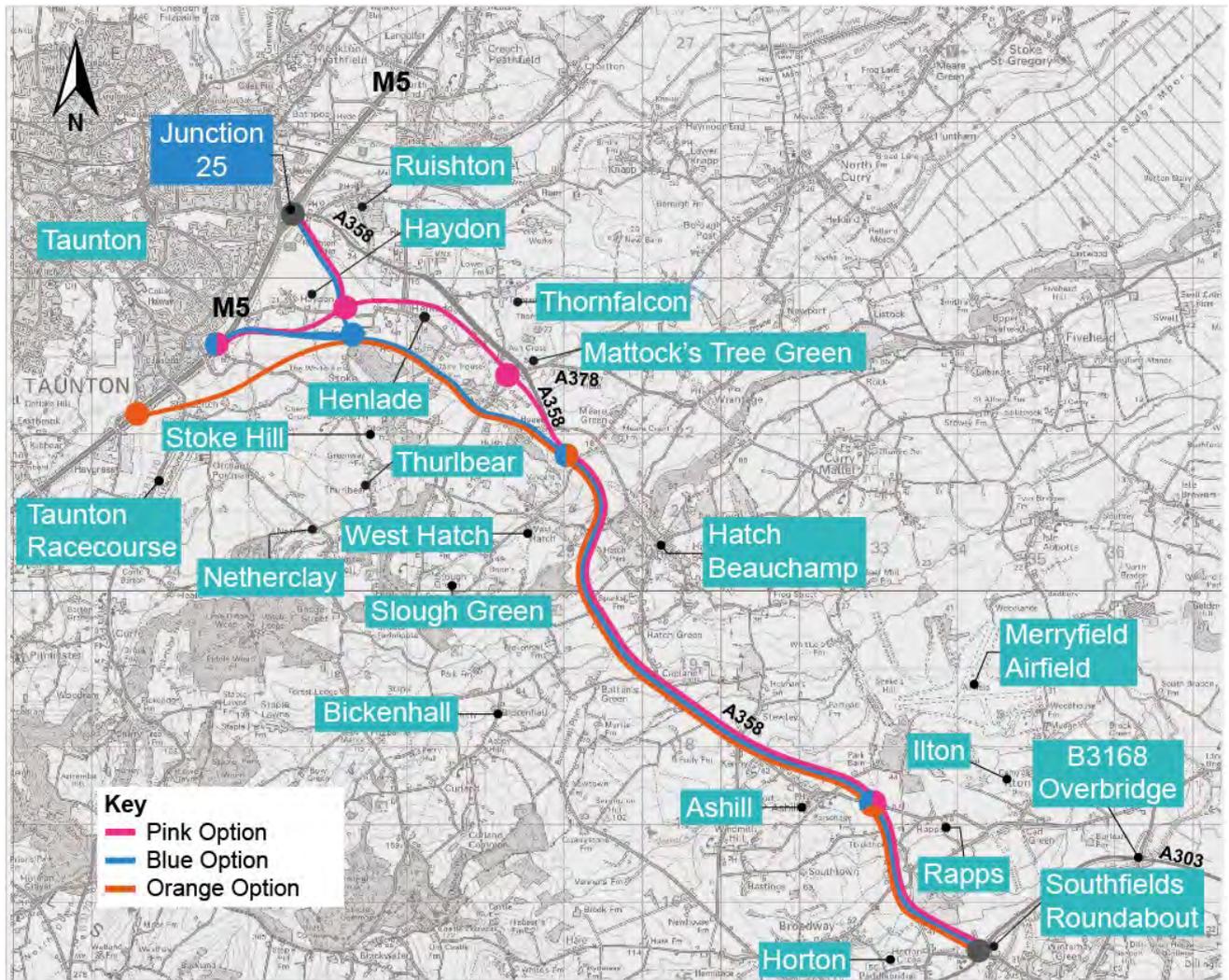
Further development and assessment of options

- 6.4.19. Alternative solutions were briefly investigated that might alleviate congestion at junction 25 whilst providing a new route away from the AONB. The most viable of these was a new junction south of M5 junction 25 further north than Option 1. A potential junction location in the vicinity of Killams Avenue was identified which could avoid direct impacts on property in the nearby vicinity and would not require a southerly route. This location was found to be compatible with possible variations of Option 2 or 8. An alternative version of Option 8 was therefore developed to enable consideration of this alternative new junction providing an alternative to Option 1 that would not raise the same environmental concerns. This new proposal was added to the shortlist and was called 'Option 8/8B+NFS'.
- 6.4.20. Overall, Option 1 would have the greatest impact on the environment. Option 1 would have a highly significant impact on the landscape due to its proximity to the Blackdown Hills AONB. It would be more visible from the higher ground than the other options and would introduce a new road corridor in a tranquil area. Option 1 would also have a greater impact on biodiversity than the other options as it would have a Large Adverse effect on Thurlbear Wood and Quarrylands Site of Special Scientific Interest. Due to these environmental impacts, it was decided that Option 1 should not be taken forward to public consultation in 2018.
- 6.4.21. The final 3 shortlisted options were as shown in Table 6.10 and Figure 6.1. The options were briefly (and arbitrarily) renumbered to ensure they could be separately identified during this process. Suffixes were used during the rationalisation process to distinguish between variations with a link to the north via the M5 junction 25 ("Jct25") or via north facing slip roads directly onto the M5 ("NFS"). This arbitrary numbering system was later amended again to reduce confusion and the 3 options renamed as the Pink, Blue and the Orange options

Table 6.10: Final shortlisted options for Stage 1 assessment and reporting

Original Option	Rationalised Option Ref	Revised Option Reference	Notes
2/2D	2A/2B	Pink	
8A/8B	8/8B+Jct25	Blue	
8A/8B	8/8B+NFS	Orange	This is the option with a new all-movement junction on the M5 in the vicinity of Killams Avenue

Figure 6.1: Final Shortlisted Options



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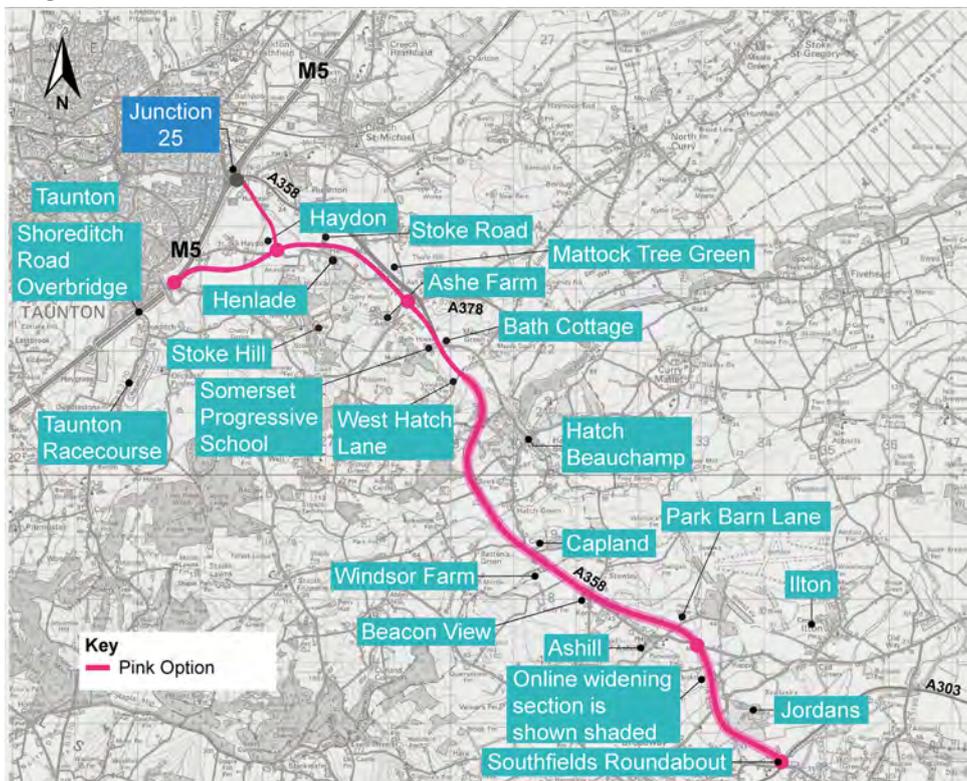
7. Shortlisted options

7.1. Pink option

Introduction

- 7.1.1. This option, shown in Figure 7.1 below, involves the re-use of the greatest amount of the existing A358 corridor of all 3 options, taking the route further north than the Blue and the Orange options between Hatch Beauchamp and Taunton. A feature of this option is that the route passes close enough to the A378 junction at Mattock's Tree Green to enable direct travel between the proposed road and the A378 via a new junction.

Figure 7.1: Pink option



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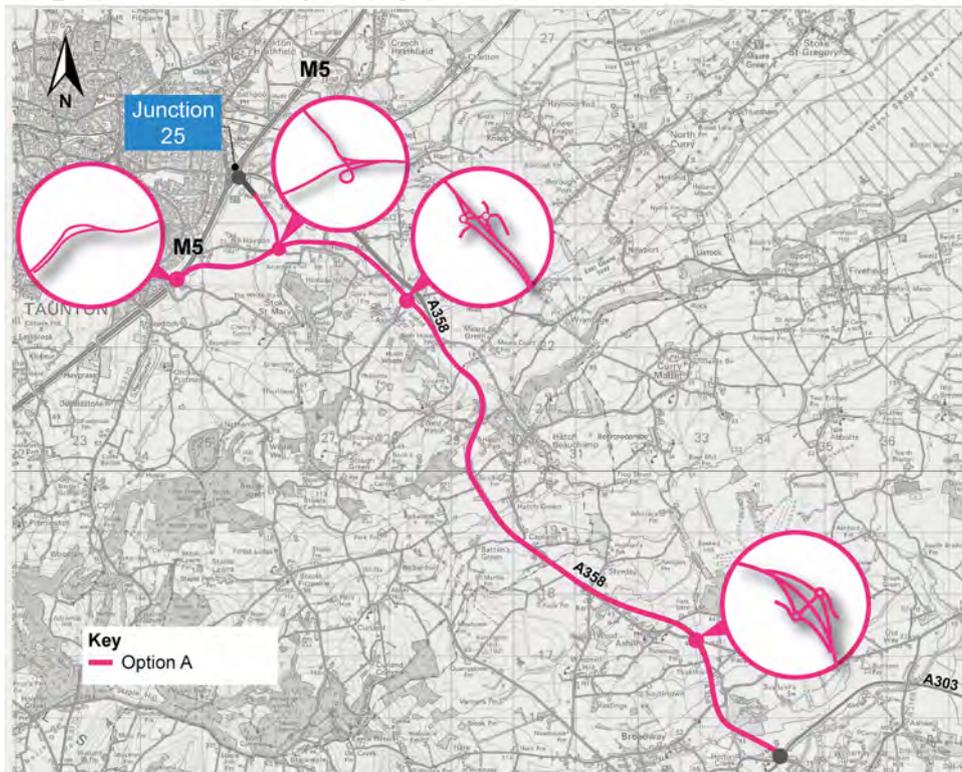
Description of route

- 7.1.2. Starting from the west, the Pink option commences at the M5 approximately 1.2 miles (2 kilometres) south of junction 25. Between Haydon and Henlade a limited-movement junction is proposed with east-facing slip road connections which would allow traffic to travel between the new A358 and junction 25 via a new 0.9 miles (1.5 kilometres) dual carriageway link.

- 7.1.3. The main route would then pass in a retained cutting through a gap between properties along Stoke Road, Henlade, before running roughly parallel to the existing A358 (approximately 100-200 metres to the south) and to the north of Dairy House Farm and Ashe Farm.
- 7.1.4. The proposed road would then meet up with the existing A358 at West Hatch Lane, passing through a gap between Bath Cottage and the Somerset Progressive School. The proposed road would then follow the existing A358 Hatch Beauchamp Bypass using asymmetrical widening. It was originally the intention for this widening to incorporate the existing road as the northbound carriageway and for a new southbound carriageway to be constructed alongside (to the north of the existing). However, since the original proposals were conceived the sensitivity of some plots to the north of the existing road have become apparent and so it may be necessary to widen on different sides of the road depending upon adjacent land.
- 7.1.5. The total length of the Pink option is 9 miles (14.6 kilometres), plus the 0.9 miles (1.5 kilometres) spur leading to M5 junction 25.

Possible junctions

Figure 7.2: Pink option - junctions



Note: Junction location and layout are indicative.

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- 7.1.6. A free-flowing junction is proposed with the M5. However, this would cater for limited movements, namely westbound A358 traffic joining the M5 southbound and vice versa. This has been located far enough south to avoid the proposed Nexus 25 employment site, and far enough north to minimise construction in the vicinity of Stoke St Mary and Shoreditch. The location should not require the acquisition of residential property to the west of the M5, and also avoids contentious land associated with the 2006-07 scheme at the Blackbrook Recreation Centre. However, the northbound slip road may require the acquisition of some open space land.
- 7.1.7. The junction proposed between Haydon and Henlade (see Figure 7.2) would also be a free-flowing, limited-movement junction between the new link road and the new A358 from the east. This would enable traffic to travel between the new road and Junction 25 on the M5, facilitating movements to and from the M5 (north) and to and from Taunton. The junction would have east-facing entry/exit slip roads on the A358. The new link to Junction 25 would either connect directly into the existing roundabout at Junction 25, or, assuming the new Nexus 25 strategic employment site proceeds as planned (see 4.2.10–4.2.12 and Figure 4.1), the link would connect into Junction 25 via the new road layout arrangements proposed as part of the planned development adjacent to Junction 25. This has been located to provide the most direct link from the proposed dual carriageway to Junction 25, whilst avoiding land associated with the employment site and minimising impact upon Stoke Hill. This is in a similar location to one of the junctions proposed as part of the 2006-07 scheme, although has a different layout intended to simplify the layout of the bridge associated with this junction.
- 7.1.8. 2 other junctions are proposed along the route:
- An all-movement, grade-separated junction at Mattock's Tree Green would accommodate free-flow of traffic along the new road while providing slip road connections with both the existing A358 and the A378. This junction would serve communities to the south of the route such as Slough Green, Thurlbear and Stoke St Mary, and Hatch Beauchamp. This has been located so that it is close to (and may therefore largely replace the need for) the existing traffic signal controlled junction), in open space just to the south of the existing junction. This is in a similar location to one of the junctions proposed as part of the 2006-07 scheme
 - A grade-separated junction would be provided near to Ashill, accommodating free-flow of traffic along the new road while providing access to communities near Ashill and Ilton.
- 7.1.9. The existing Southfields Roundabout on the A303 would be modified to accommodate the new A358 dual carriageway connecting into the roundabout. Other existing arms would be retained, although will require widening in order to provide additional capacity.

- 7.1.10. The proposed size and layout of these junctions would be determined during further design development and would be based upon predicted traffic volumes and relevant design standards. The precise junction locations may also vary to avoid constraints and optimise service to local traffic and non-motorised users.

Structures

- 7.1.11. Structures, primarily overbridges, would be required at each of the junctions identified above. Structures, again primarily overbridges, would also be required in order to carry local roads over the proposed new road and maintain local road connectivity.
- 7.1.12. Culverts would be required to convey existing watercourses under the new roads. In some instances, these culverts would comprise simple piped cross sections, although for more significant watercourses these structures may need to have rectangular cross sections or be simple integral bridges. It is noted that watercourses such as Broughton Brook, Venner's Water and Fivehead River, all of which are crossed by the route of the Pink option, have flood plains. Depending upon the flood risk assessment the structures will be large enough to ensure the scheme does not increase the risks of flooding.
- 7.1.13. Retaining walls would be required to minimise impact on adjacent property. This would include a retained cutting where the proposed road passes through the gap between property along Stoke Road, Henlade, and retaining structures to accommodate carriageway widening of the M5 motorway associated with the south-facing slip roads. These retaining walls would be necessary to avoid or reduce impact upon adjacent residential properties, allotments and public open space (known as Higher Holway Open Space) adjacent to the motorway.

Compliance with standards

- 7.1.14. The design development of this option would aim to maximise retention of the existing A358, particularly the Ashill and Hatch Beauchamp Bypasses which were constructed in the 1980s and 1990s and as such are relatively high-standard single-carriageway construction. However, the pair of sweeping bends that carry the A358 around the western periphery of Hatch Beauchamp have been assessed to have horizontal and vertical alignment that is not to current relevant geometric standards for the proposed higher speed dual carriageway. It is considered that there is sufficient justification for the retention of this alignment on the basis that it can be managed safely, would minimise construction disruption, waste and visual intrusion. Corresponding departures would therefore be sought. If more detailed assessment indicates that there would be safety concerns, the route could still be achieved by straightening the existing road alignment, albeit at additional cost.

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- 7.1.15. The layout of junctions is generally anticipated to be compliant with the geometric standards for each junction type. However, as design development progresses and constraints become clearer, it may be necessary to balance impacts and relax the standard of provision, in which case the appropriate technical approval would be obtained prior to incorporating any reduced elements into the design.

Drainage considerations

- 7.1.16. From the proposed junction with the M5, the first 2.5 miles (4 kilometres) of this route passes through the Black Brook and Broughton Brook catchments. These watercourses eventually drain to the River Tone just downstream of Taunton. As this section comprises a new off-line route and there are flood plains associated with most of the watercourses, the drainage scheme through this section would need to meet stringent performance requirements, particularly regarding the control of flooding.
- 7.1.17. The following 2.1 miles (3.5 kilometres) drains into the Widness Rhyne which, via West Sedgemoor, is a tributary of the River Parrett. A significant flood plain is associated with West Sedgemoor, and this is would be a factor in the design of drainage for these sections.
- 7.1.18. Along the online widening sections between Hatch Beauchamp and Southfields Roundabout, works would involve the extension of existing crossings of watercourses such as Fivehead River, Venner's Water and other tributaries of the River Isle and modifications to existing drainage outfalls. It has been noted that flood mapping obtained from the Environment Agency indicates that some of the existing watercourse crossings appear to act as a throttle, increasing the extents of existing upstream flood plains. Requirements for these culverts with regards to alleviating existing flooding problems would need to be considered as the design progresses.

Design considerations

- 7.1.19. Edge-of-pavement detailing would follow the conventions set out in the Design Manual for Roads and Bridges and Highway Construction Details. Concrete channels would be used for the collection of surface run-off, and these channels would outfall to adjacent watercourses via sustainable treatment systems. The treatment measures would vary from site to site depending upon aspects such as available space and sensitivity of the receiving watercourses, although ponds and basins are expected to be the appropriate treatment method along the majority of the Pink option. The exception to this would be the tie in works at the M5 motorway which would be constrained by the need to minimise impact on adjacent property. In this area flood and pollution control measures would likely comprise of enlarged pipes, tanks and valves.

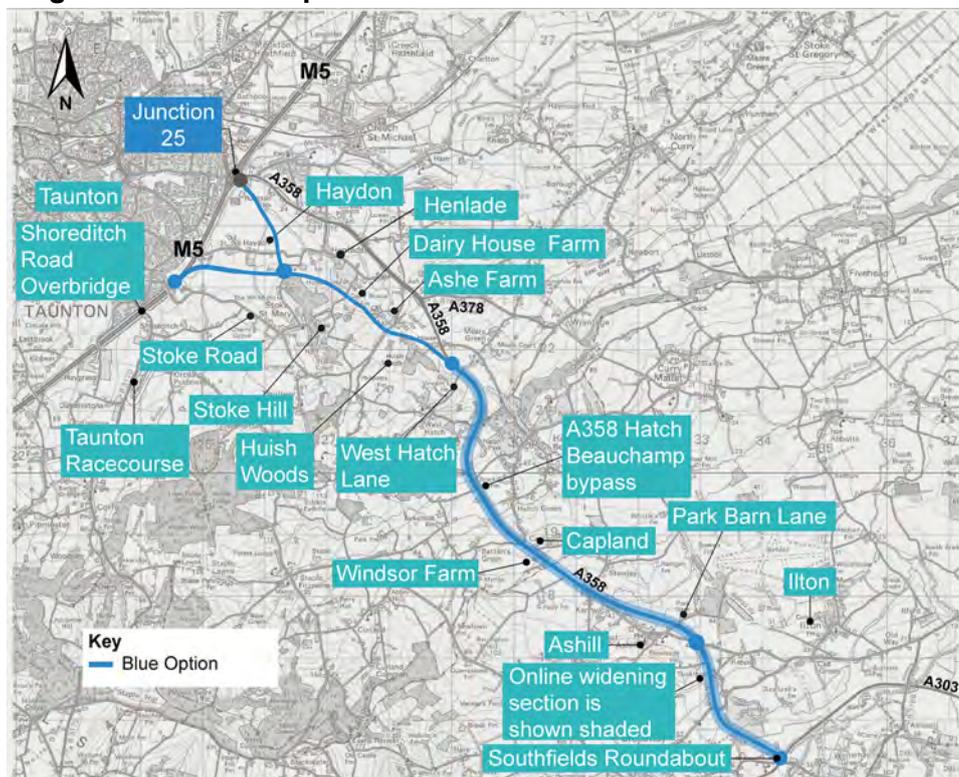
7.1.20. Earthworks drainage, pavement foundation drainage and drainage outfalls would be provided as required in accordance with the Design Manual for Roads and Bridges and where necessitated by geotechnical design.

7.2. Blue option

Introduction

7.2.1. The online section for this option is almost identical to that proposed for the Pink option. However, the off-line section takes a more southerly route than the Pink option, passing to the south of Ashe Farm and Dairy House Farm and around the northern slope of Stoke Hill. The route is shown in Figure 7.3 below.

Figure 7.3: Blue option



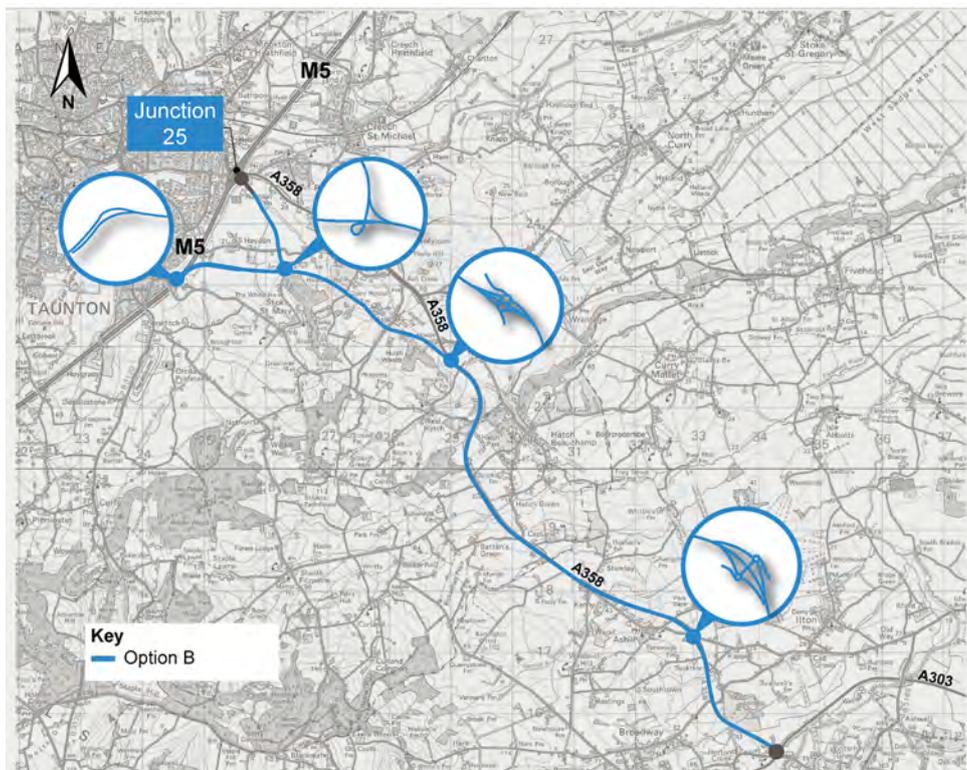
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Description of route

- 7.2.2. The Blue option commences at the M5 approximately 1.2 miles (2 kilometres) south of junction 25. South facing slip roads commence just north of Shoreditch Road Overbridge and pass over the M5 carriageway to become the new road, which initially passes south of Haydon. At Stoke Hill a junction is proposed which would allow traffic to travel between the new A358 and junction 25 via a new 1.2 miles (2 kilometres) dual carriageway link which would connect to a roundabout and link road that are proposed as part of the strategic employment site adjacent to junction 25. The road would then continue in a south easterly direction for 1.5 miles (2.5 kilometres) passing to the south of Dairy House Farm, Ashe Farm, skirting the northern boundary of Huish Woods and then joining up with the existing A358 corridor at West Hatch Lane.
- 7.2.3. This option is identical to the Pink option from this point onwards.
- 7.2.4. The total length of the Blue option is 8.7 miles (14.1 kilometres), plus the 1.2 miles (2.0 kilometres) spur leading to M5 junction 25.

Possible junctions

Figure 7.4: Blue option - Junctions



Note: Junction location and layout are indicative.

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- 7.2.5. A free-flowing junction is proposed with the M5. This would cater for limited movements, namely westbound A358 traffic joining the M5 southbound and vice versa. This has been located far enough south to avoid the proposed Nexus 25 employment site, and far enough north to minimise construction in the vicinity of Stoke St Mary and Shoreditch. The location should not require the acquisition of residential property to the west of the M5, and also avoids contentious land associated with the 2006-07 scheme at the Blackbrook Recreation Centre. However, the northbound slip road may require the acquisition of some open space land.
- 7.2.6. Another limited movements junction would be provided to the east which would enable traffic to travel between the new road and junction 25 of the M5, subsequently enabling movements to and from the M5 (north) and to and from Taunton. This has been located to provide the most direct link from the proposed dual carriageway to Junction 25, whilst avoiding land associated with the employment site and minimising impact upon Stoke Hill.
- 7.2.7. An all-movement, grade-separated junction would be provided at West Hatch Lane to enable travel between the new road and the existing A358. This junction would also serve adjacent communities such as West Hatch and Hatch Beauchamp. This has been located to provide a connection between the proposed dual carriageway and the existing retained A358 carriageway at the point where the two roads diverge.
- 7.2.8. A grade-separated junction near to Ashill would accommodate free-flowing traffic on the A358 while providing a connection with the local road network, serving nearby communities towards Ilton to the east and Ashill to the west.
- 7.2.9. The existing Southfields Roundabout on the A303 would be modified to accommodate the new A358 dual carriageway connecting into the roundabout. Other existing arms would be retained, although will require widening in order to provide additional capacity.
- 7.2.10. The proposed size and layout of these junctions would be determined during further design development and would be based upon predicted traffic volumes and relevant design standards. Junction locations may also vary to avoid constraints and optimise service to local traffic and non-motorised users.

Structures

- 7.2.11. Structures, primarily overbridges, would be required at each of the junctions identified above. Structures, again primarily overbridges, would also be required to carry local roads across the proposed new road and maintain local road connectivity.

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- 7.2.12. Culverts would be required to convey existing watercourses under the proposed road and local roads. In some instances, these culverts would comprise simple piped cross sections, although for more significant watercourses these structures may need to have rectangular cross sections or be simple integral bridges. It is noted that watercourses such as Broughton Brook, Venner's Water and Fivehead River, all of which are crossed by the route of the Blue option, have flood plains. The design of the structures will be sufficient to accommodate any flood risks associated with these watercourses.
- 7.2.13. Retaining walls would be required to accommodate carriageway widening of the M5 motorway associated with the south facing slip roads. These walls would be necessary to minimise impact upon adjacent residential property, allotments and open space adjacent to the motorway.

Compliance with standards

- 7.2.14. An objective of the design development of this option would be to maximise retention of the existing A358, particularly the Ashill and Hatch Beauchamp Bypasses which were constructed in the 1980s and 1990s and as such are relatively high standard single carriageway construction. However, the pair of sweeping bends that carry the A358 around the western periphery of Hatch Beauchamp have been assessed to have horizontal and vertical alignment that is not to current relevant geometric standards for the proposed dual carriageway. These elements are also likely to contribute to visibility that is not to current standards. It is considered that there is sufficient justification for the retention of this alignment on the basis that it would minimise construction disruption, waste and visual intrusion. Corresponding departures would therefore be sought. There is also precedent in the proposal to incorporate this alignment in the proposed scheme as this was the intention in the previous 2006-07 Scheme.
- 7.2.15. The layout of junctions is generally anticipated to be compliant with the geometric standards for each junction type. However, as design development progresses and constraints become clear, it may be necessary to relax the standard of provision in which case the appropriate technical approval would be obtained prior to incorporating any reduced elements into the design.

Drainage considerations

- 7.2.16. From the proposed junction with the M5, the first 2.5 miles (4 kilometres) of this route passes through the Black Brook and Broughton Brook catchments. These watercourses eventually drain to the River Tone just downstream of Taunton. As this section comprises a new off-line route and there are flood plains associated with most of the watercourses it is expected that the drainage scheme through this section will need to meet stringent performance requirements, particularly regarding the control of flooding.

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- 7.2.17. The following 2.1 miles (3.5 kilometres) will drain into the Widness Rhyne which, via West Sedgemoor, is a tributary of the River Parrett. A significant flood plain is associated with West Sedgemoor, and this is likely to be a factor in the design of drainage for these sections.
- 7.2.18. Along the online widening sections between Hatch Beauchamp and Southfields Roundabout construction will essentially involve the extension of existing crossings of watercourses such as Fivehead River, Venner's Water and other tributaries of the River Isle and modifications to existing drainage outfalls. It has been noted that flood mapping obtained from the Environment Agency indicates that some of the existing watercourse crossings appear to act as a throttle, increasing the extents of existing upstream flood plains. Requirements for these culverts with regards to alleviating existing flooding problems will need to be considered as the design progresses.

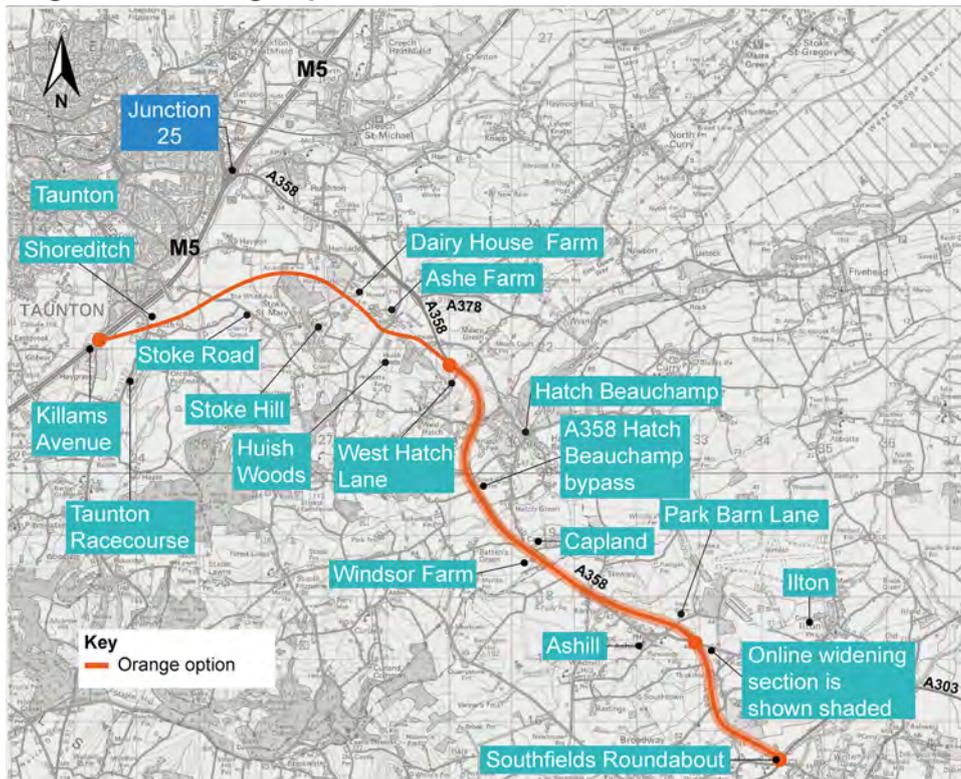
Design considerations

- 7.2.19. Edge of pavement detailing would follow the conventions set out in the Design Manual for Roads and Bridges and Highway Construction Details. Concrete channels would be used for the collection of surface run-off, and these channels would outfall to adjacent watercourses via sustainable treatment systems. The treatment measures would vary from site to site depending upon aspects such as available space and sensitivity of the receiving watercourses, although ponds and basins are expected to be the appropriate method along the majority of route the Blue option. The exception to this would be the tie in works at the M5 motorway which would likely be constrained by the need to reduce impact on adjacent property. In this area flood and pollution control measures would likely comprise of enlarged pipes, tanks and valves.
- 7.2.20. Earthworks drainage, pavement foundation drainage and outfalls would be provided as required in accordance with the Design Manual for Roads and Bridges and where necessitated by geotechnical design.

7.3. Orange option

Introduction

- 7.3.1. The online section of this option is almost identical to that proposed for the Pink option. The off-line section takes a similar route to the Blue option, although the link to junction 25 is omitted in favour of a new all-movements junction with the M5, approximately 1.4 miles (2.2 kilometres) south of junction 25. This option would provide an additional north facing connection to the M5 that is not available with the Blue option, hence the earlier use of the "NFS" (North Facing Slips) suffix. This option is shown in Figure 7.5 below.

Figure 7.5: Orange option

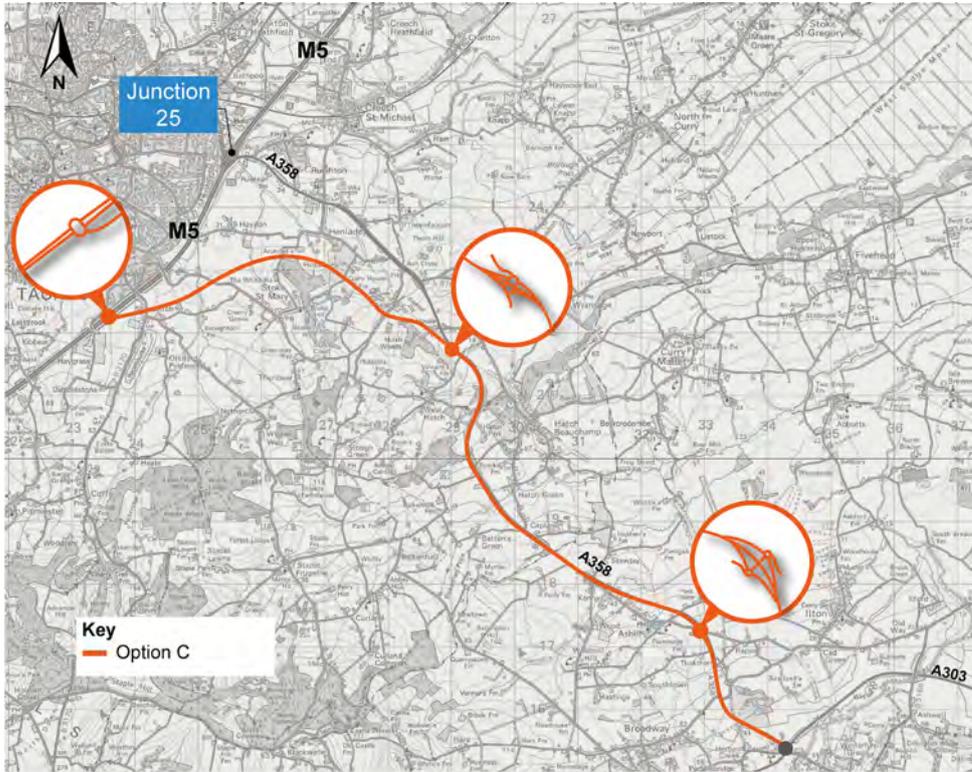
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Description of route

- 7.3.2. The Orange option commences at the M5 approximately 2.1 miles (3.5 kilometres) south of junction 25 at a new 2-bridge roundabout which forms a new all-movements junction with the motorway. The proposed road initially takes a north-easterly course past Shoreditch, crossing the B3170 and Stoke Road before arcing around the north of Stoke Hill. In contrast to the Blue option, there is no link to junction 25 from this location, and therefore no junction at Stoke Hill.
- 7.3.3. From Stoke Hill the proposed road continues in a south easterly direction for 1.5 miles (2.5 kilometres) passing to the south of Dairy House Farm, Ashe Farm, skirting the northern boundary of Huish Woods and then joining up with the existing A358 corridor at West Hatch Lane.
- 7.3.4. This option is identical to the Blue option from this point onwards.
- 7.3.5. The total length of the Orange option is 9.5 miles (15.3 kilometres).

Possible junctions

Figure 7.6: Junctions Orange option



Note: Junction location and layout are indicative.

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- 7.3.6. An all-movement, grade-separated junction would be provided at the connection to the M5 motorway. This would be located approximately 1.4 miles (2.2 kilometres) south of junction 25, and would essentially form a new junction on the M5 for strategic traffic. This has been located far enough south to provide the minimum permitted separation from Junction 25, whilst avoiding the need to directly acquire residential property to the south, along the B3170 and Killams Avenue. The acceptable separation between consecutive junctions (the 'weaving length') is 2 kilometres and the distance between the proposed Killams Avenue Junction and the existing Junction 25 (measured from merge tip to diverge tip) is just over 2 kilometres (2.2 kilometres).
- 7.3.7. An all-movement, grade-separated junction would be provided at West Hatch Lane to enable connection with the existing A358 and A378. This junction would also serve adjacent communities such as West Hatch and Hatch Beauchamp. This has been located to provide a connection between the proposed dual carriageway and the existing retained A358 carriageway at the point where the two roads diverge.
- 7.3.8. A grade-separated junction near to Ashill would accommodate free-flowing traffic on the A358 while providing a connection with the local road network, serving nearby communities towards Ilton to the east and Ashill to the west.

- 7.3.9. The existing Southfields Roundabout on the A303 would be modified to accommodate the new A358 dual carriageway connecting into the roundabout. Other existing arms would be retained, although will require widening in order to provide additional capacity.
- 7.3.10. The proposed size and layout of these junctions would be determined during further design development and would be based upon predicted traffic volumes and relevant design standards. Junction locations may also vary to avoid constraints and optimise service to local traffic and non-motorised users.

Structures

- 7.3.11. Structures, primarily overbridges, would be required at each of the junctions identified above. Structures, again primarily overbridges, would also be required to carry local roads across the proposed new road and maintain local road connectivity.
- 7.3.12. Culverts would be required to convey existing watercourses under the proposed road and local roads. In some instances, these culverts would comprise simple piped cross sections, although for more significant watercourses these structures would need to have rectangular cross sections or be simple integral bridges. It is noted that watercourses such as Broughton Brook, Venner's Water and Fivehead River, all of which are crossed by the route of the Orange option, have flood plains. The design of the structures will be sufficient to accommodate any flood risks associated with these watercourses.
- 7.3.13. Retaining walls would be required to reduce impact on adjacent property. For the Orange option it is not anticipated that these structures will be large or numerous.

Compliance with standards

- 7.3.14. An objective of the design development of this option is to maximise retention of the existing A358, particularly the Ashill and Hatch Beauchamp Bypasses which were constructed in the 1980s and 1990s and as such are relatively high standard single carriageway construction. However, the pair of sweeping bends that carry the A358 around the western periphery of Hatch Beauchamp have been assessed to have horizontal and vertical alignment that is not to current relevant geometric standards for the proposed dual carriageway. These elements would contribute to visibility that is not to current standards. It is considered that there is sufficient justification for the retention of this alignment on the basis that it would minimise construction disruption, waste and visual intrusion. Corresponding departures would therefore be sought.

- 7.3.15. The layout of junctions is generally anticipated to be compliant with the geometric standards for each junction type. However, as design development progresses and constraints become clearer, it may be necessary to balance impacts and relax the standard of provision, in which case the appropriate technical approval would be obtained prior to incorporating any reduced elements into the design.

Drainage considerations

- 7.3.16. From the proposed junction with the M5, the first 3.1 miles (5 kilometres) of this route would pass through the Black Brook and Broughton Brook catchments. These watercourses eventually drain to the River Tone just downstream of Taunton. As this section would comprise a new off-line route and there are flood plains associated with most of the watercourses it is expected that the drainage scheme through this section would need to meet stringent performance requirements, particularly regarding the control of flooding.
- 7.3.17. The following 2.1 miles (3.5 kilometres) would drain into the Widness Rhyne which, via West Sedgemoor, is a tributary of the River Parrett. A significant flood plain is associated with West Sedgemoor, and this is likely to be a factor in the design of drainage for these sections.
- 7.3.18. Between Hatch Beauchamp and Southfields Roundabout, drainage outfalls would be to the Fivehead River, Venner's Water and other tributaries of the River Isle. Works would essentially involve the extension of existing watercourse crossings, including those that currently already have flood plains. It has been noted that flood mapping obtained from the Environment Agency indicates that some of these existing watercourse crossings appear to act as a throttle, increasing the extents of existing upstream flood plains. Requirements for these culverts and any associated outfalls from the upgraded road with regards to alleviating existing flooding problems will need to be considered as the design progresses.

Design considerations

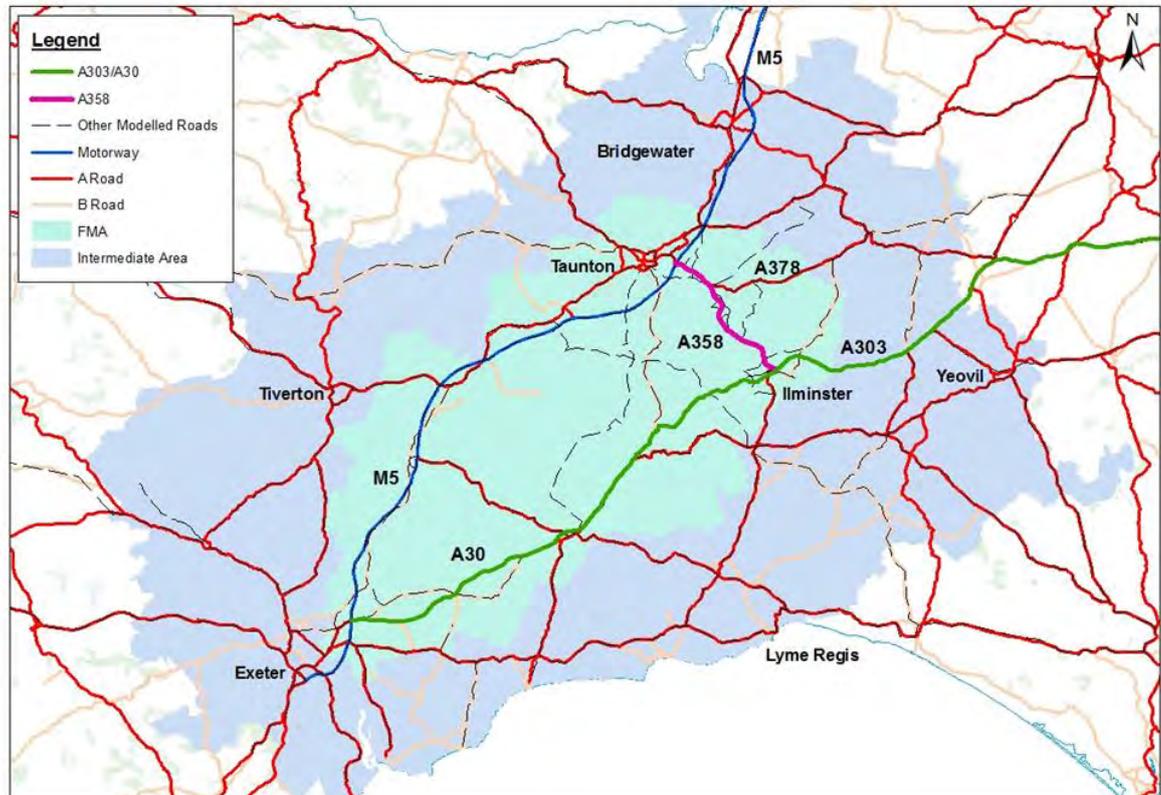
- 7.3.19. Edge of pavement detailing would follow the conventions set out in the Design Manual for Roads and Bridges and Highway Construction Details. Concrete channels would be used for the collection of surface run-off, and these channels would outfall to adjacent watercourses via sustainable treatment systems. The treatment measures would vary from site to site depending upon aspects such as available space and sensitivity of the receiving watercourses, although ponds and basins would be expected to be the appropriate method along the majority of route the Orange option. The exception to this will be the tie in works at the M5 motorway which would be constrained by the need to reduce impact on adjacent property. In this area flood and pollution control measures would comprise of enlarged pipes, tanks and valves.
- 7.3.20. Earthworks drainage, pavement foundation drainage and outfalls would be provided as required in accordance with the Design Manual for Roads and Bridges and where necessitated by geotechnical design.

8. Traffic analysis

8.1. Traffic data

- 8.1.1. The performance of the options in terms of traffic has been assessed by using a traffic model. The traffic model utilises traffic data from various sources to model the flows on the existing network and its associated operation in a base year. The options are then superimposed on this network in the model which then estimates how traffic will redistribute to use the proposed improvements. The economic benefits accrued through this redistribution are then determined through consideration in changes in overall journey times across the whole network, changes to the number of accidents and changes in social impacts such as noise and air quality. These economic benefits are then compared to the costs of the various options to indicate value for money and thus which option should perform better economically.
- 8.1.2. To assist with the creation of a strategic model for the scheme a large amount of data has been obtained from local authority datasets. The fully modelled and intermediate study areas for the traffic model is shown in Figure 8.1 below.

Figure 8.1: Traffic Study Area



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- 8.1.3. From Somerset County Council (SCC) the following types of data were obtained:
- Automatic Traffic Count (ATC)
 - Manual Classified Count (MCC)
 - Roadside Interview Data (RSI)
 - Journey Time Data
- 8.1.4. From Devon County Council (DCC) the following types of data were obtained:
- Automatic Traffic Count (ATC)
 - Manual Classified Count (MCC)
 - Roadside Interview Data (RSI)
- 8.1.5. The above data included considerable amounts of ATC and MCC data for both the A358 and the A303 / A30 between Honiton and Ilminster.
- 8.1.6. M5 junction 29 is an important part of the alternative routes between Exeter and Southfields and would be the decision point for the choice between A30 / A303 and M5 / A358 for eastbound traffic. Junction 29 is also a recently improved and complex junction which is important to represent accurately in the traffic model. For this reason, additional manual classified turning count data for junction 25 of the M5 at Taunton and classified count data was obtained for sections of junction 29 of the M5 at Exeter from Highways England sources.
- 8.1.7. ATC and journey time data was also obtained directly from Highways England and Department for Transport. For data up until the end of March 2015, the Highways Agency Traffic Information System (HATRIS) database was used. Data for the remainder of 2015 is obtained from the new Highways England Open Source online.
- 8.1.8. Origin-destination (O-D) data is important for building transport models. Some O-D data (in the form of road side interview data) was available from local authority sources, however the majority of this data was not collected within the immediate study area for this scheme. To complement the existing data, Roadside Interview Surveys (RSIs), MCCs, ATCs were undertaken in 2015. Manual Classified Turning Counts (MCTCs) were also undertaken at two locations to supplement the data.

8.2. Traffic analysis methodology

- 8.2.1. The purpose of developing the new local traffic model was to forecast the traffic impacts of options for dualling the existing A358 and to provide the evidence base for scheme appraisal. The following sections describe how the base model was built and used to produce future-year forecasts for the scheme options.

Base year model

- 8.2.2. The local highway traffic model has been developed in the SATURN10 suite of traffic modelling software, in accordance with the DfT's Transport Analysis Guidance (WebTAG), to represent 3 weekday time periods that are consistent with the time periods in the South West Regional Traffic Model (SWRTM) which provides the wider context for the local model. These are an average AM peak period hour (07:00-10:00), an average hour in the inter-peak (10:00-16:00) and an average PM peak period hour (16:00-19:00) for an average Monday to Thursday weekday in October 2015 (excluding school holidays). A weekday off-peak period (19.00-07.00) model has also been derived from the inter-peak model to assist with data provided for appraisal purposes. It should be noted that higher traffic flows occur at weekends and during holiday periods but, at this stage, these have not been modelled. Seasonal traffic will be addressed at the next stage of the scheme's development.
- 8.2.3. The zoning system within the model has been largely based upon the zoning system within the SWRTM. Within the Fully Modelled Area (FMA), and in close proximity to the proposed scheme and key areas of the A358 and A303 / A30, it has been necessary to split the SWRTM zones further to match the lowest level of census area being used - Output Areas (OA). To represent development sites in the vicinity of the M5 junction 25, new zones have been created within OA's. The network comprises 248 different zones split amongst 3 distinct model areas:
- Fully Modelled Area (FMA) – this is the area over which the proposed scheme will have a significant influence. This network focuses on the M5, A358 and A303 / A30 and is bounded by 3 key junctions: M5 junction 25 that connects the M5 with the A358 at Taunton; Southfields Roundabout at the junction of the A358 / A303 at Ilminster; and M5 junction 29 that connects the M5 with the A30 at Exeter. The links included within the FMA are fully simulated within the SATURN model, with junction delays included.
 - Intermediate Area – developed in order to ensure the correct movement of trips between the external (SWRTM) network and the FMA and modelled as a buffer network with a relatively fine zoning system and road network. Relevant Speed Flow Curves have been applied to each link within the intermediate area, with no junction delay included.
 - A network external to the FMA and intermediate areas (from the SWRTM) which provides the robust loading and routing of longer distance strategic trips with modelling characterised by a great deal of zonal aggregation and a minimal road network. Again, relevant Speed Flow Curves have been

¹⁰ SATURN: Simulation and Assignment of Traffic to Urban Road Networks

applied to each link included within the external area, with no junction delay included.

- 8.2.4. Trip matrices have been prepared based on both observed and synthetic data. Checks were undertaken at key stages in the development of the matrices to ensure that the provenance of the matrices is maintained. Checks include analysis of the observed and synthetic matrices prior to merging and, after merging, comparisons with counts before applying matrix estimation. Analyses of the effects of matrix estimation are also in line with current WebTAG guidance.
- 8.2.5. The SATURN model convergence meets WebTAG criteria in all time periods. The model achieves a good level of traffic flow calibration, with results indicating a close match to observations on the calibration screenlines and for individual link counts in all time periods for all vehicles and cars.
- 8.2.6. Traffic flow validation has been undertaken against independent count data, and the validation shows that the model also achieves a good level of flow validation in each of the modelled time periods.
- 8.2.7. Journey time validation is good, with the model accurately recreating all journey times that are representative on key routes in the modelled area, although the variability of the westbound delays on the A358 are difficult to accurately replicate in the model.
- 8.2.8. In conclusion, it is considered that the base year highway assignment developed for the October 2015 weekday average (Monday to Thursday) scheme traffic model demonstrates a good representation of traffic behaviour in the study area and forms a robust basis from which future year forecasts can be developed.

Traffic Forecasting

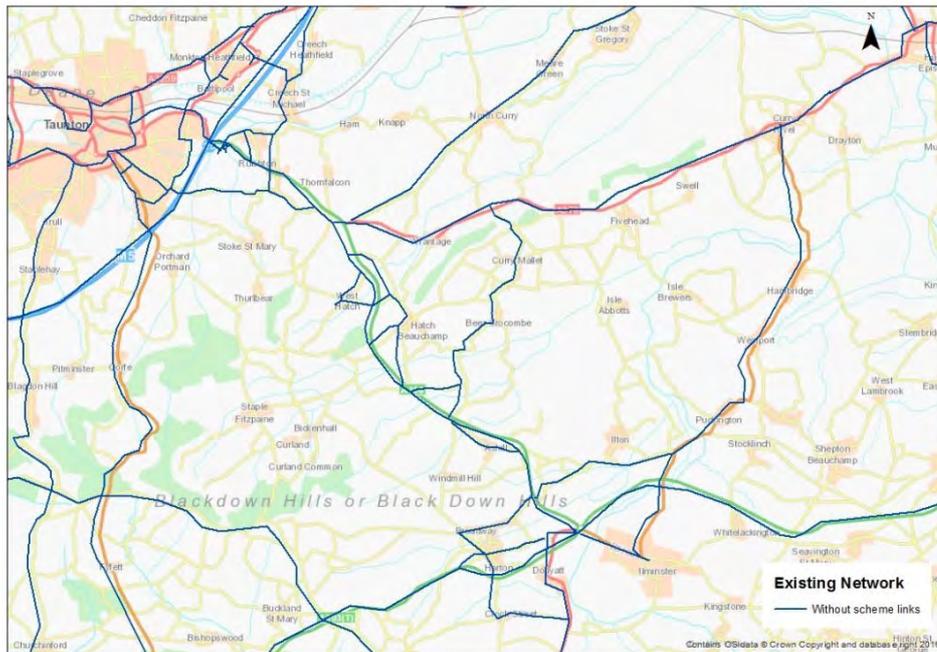
- 8.2.9. Whilst the scheme development programme is continually being reviewed, the traffic forecasts have been prepared for 2 forecast years, an assumed scheme opening year of 2023 and a design year 15 years later, 2038. The forecasting method took account of the spatial allocation of local development as well as using the DfT's National Trip End Model 7.0 (NTEM7.0) released in July 2016 and the latest 2015 Road Transport Forecast databases. Since the release of NTEM 7.0, some localised issues have been identified with the dataset. Nevertheless, for the purposes of this stage of the assessment, the NTEM7.0 was used in the forecasting leaving the improved revision of NTEM to be used in the next stages of the scheme development, together with any changes in the forecasting years.

-
- 8.2.10. First the growth factors for the networks different zones were derived from NTEM and the matrices were factored to account for projected forecasted growth. Next the different developments identified by local councils were assessed in an uncertainty log to identify those likely to be built by the opening or design years. The additional trips that these sites were projected to attract were incorporated into finessed matrices.
- 8.2.11. The traffic forecasts have been prepared assuming a fixed matrix on an origin-destination basis using the local SATURN traffic model. Variable demand modelling has not been implemented at this stage but will be at the next stage in the scheme's development. In the absence of variable demand modelling, fuel and income factors have been applied to the trip-end growth to represent the effect of changing costs over time, in accordance with WebTAG guidance.
- 8.2.12. Future year Most Likely (Do Minimum) networks have been based on the 2015 validated model. The developments included in the Most Likely scenarios were identified following an assessment of the likelihood of each development going ahead. The Strategic Employment Site at Henlade (Nexus 25, located just south of M5 Junction 25) has been considered in the analysis (Do Minimum and Do Something) even though it had a likelihood of "Reasonably Foreseeable". This site was included given its size and the importance to the A303 / A358 corridor, including the operation of M5 Junction 25. Those developments that would create a different highway structure have been coded as differences between the 2023 and 2038 Do Minimum networks and the 2015 base networks.
- 8.2.13. Results indicate that the numbers of trips are forecast to increase for future forecast years of 2023 and 2038 above base year 2015 values across the study area. As the model has been run with a fixed trip matrix, this means the initial future year trip matrices loaded on the Do Minimum and the Do Something networks are the same.

8.3. Traffic Model

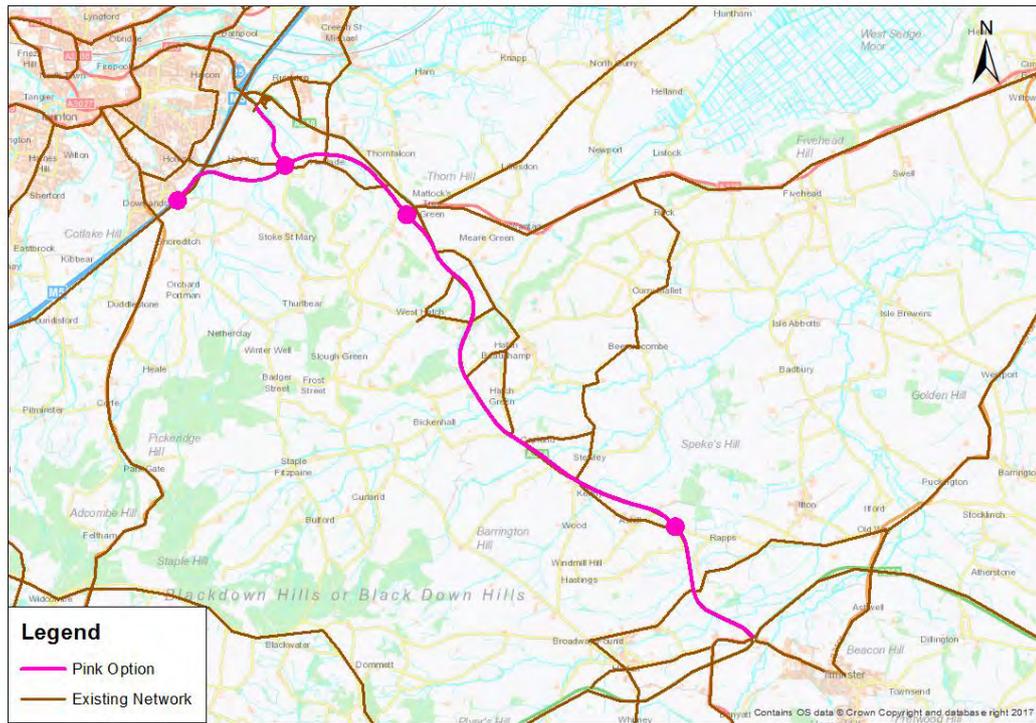
- 8.3.1. Figure 8.2 shows the without-scheme scenario, the local traffic model network is overlaying a map base of the local area. Figure 8.3 to Figure 8.5 show the graphical representations of the future forecast networks as they appear in with-scheme networks; the pink links show the new model links added to represent each of the 3 scheme options that have been tested.

Figure 8.2: A358 Taunton to Ilminster network – without scheme



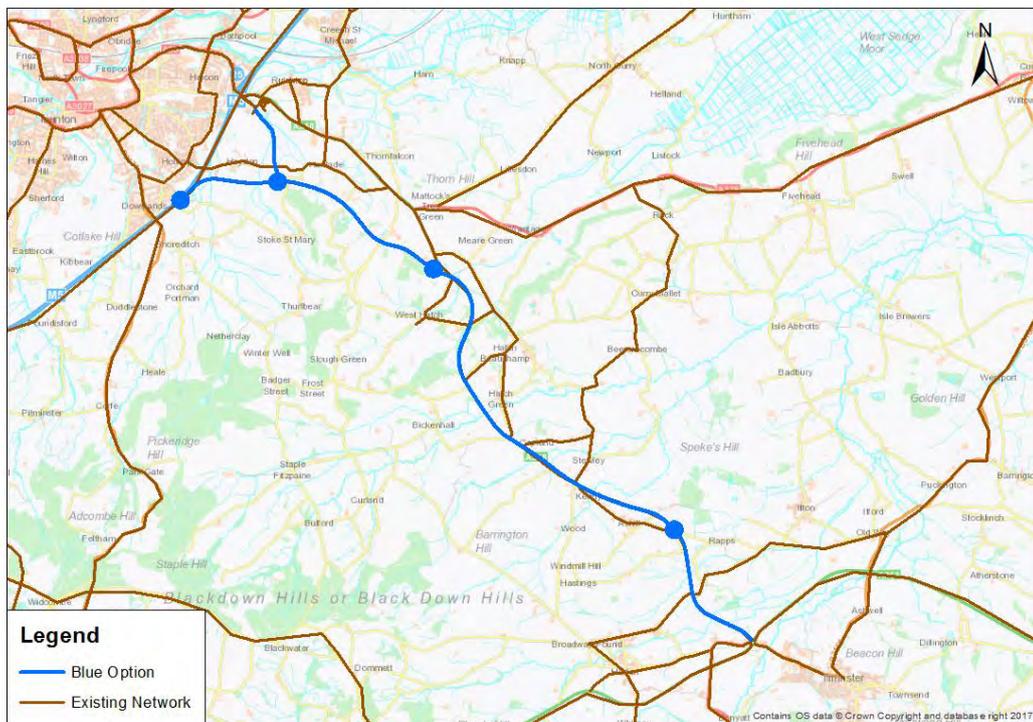
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Figure 8.3: A358 Taunton to Iminster network – with the Pink option



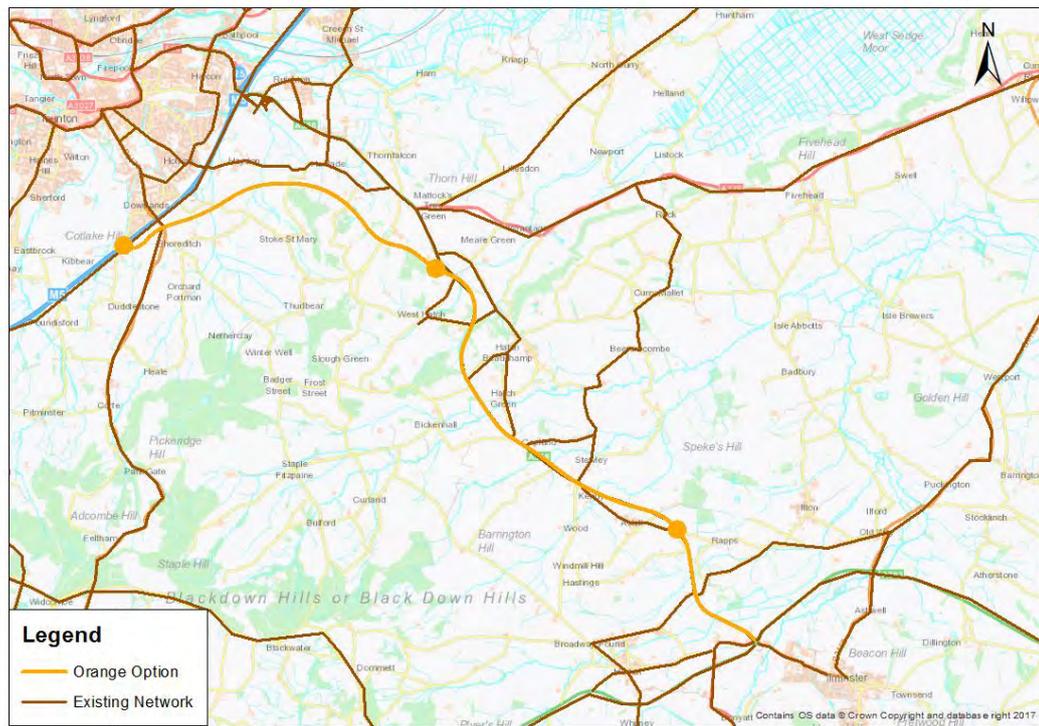
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Figure 8.4: A358 Taunton to Iminster network – with the Blue option



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Figure 8.5: A358 Taunton to Iminster network – with the Orange option



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8.4. Summary of traffic assessment

Introduction

8.4.1. The 3 route options described in Section 7 of this report have been assessed and compared in terms of:

- Analysis of Annual Average Daily Traffic (AADT)
- Analysis of Journey Times
- Operational Assessment of M5 Junction 25

Analysis of Annual Average Daily Traffic

8.4.2. Analysis of Annual Average Daily Traffic (AADT – see Figure 8.8 to Figure 8.13 at the end of this section) shows flow differences on the new A358 to the east of the M5 between the Blue option (45,900 2-way flow in 2038) and the Orange option (26,000 2-way flow in 2038). The difference in AADTs is due to the presence of the link onto Junction 25 in the Blue option which attracts Taunton traffic to the new scheme whereas in the Orange option this traffic remains on the existing A358 through Henlade. The Pink option attracts the most traffic to the new A358 (54,600 2-way flow in 2038), with the majority of this traffic (73%) travelling to and from the M5 north and Taunton via the new link to junction 25, the remainder (27%) using the new free flow slip roads with the M5 south. The higher AADTs in the Pink option, when compared with the Blue option, are due to the Pink option being able to attract additional traffic from the A378 given the location of a proposed new junction adjacent to the A378.

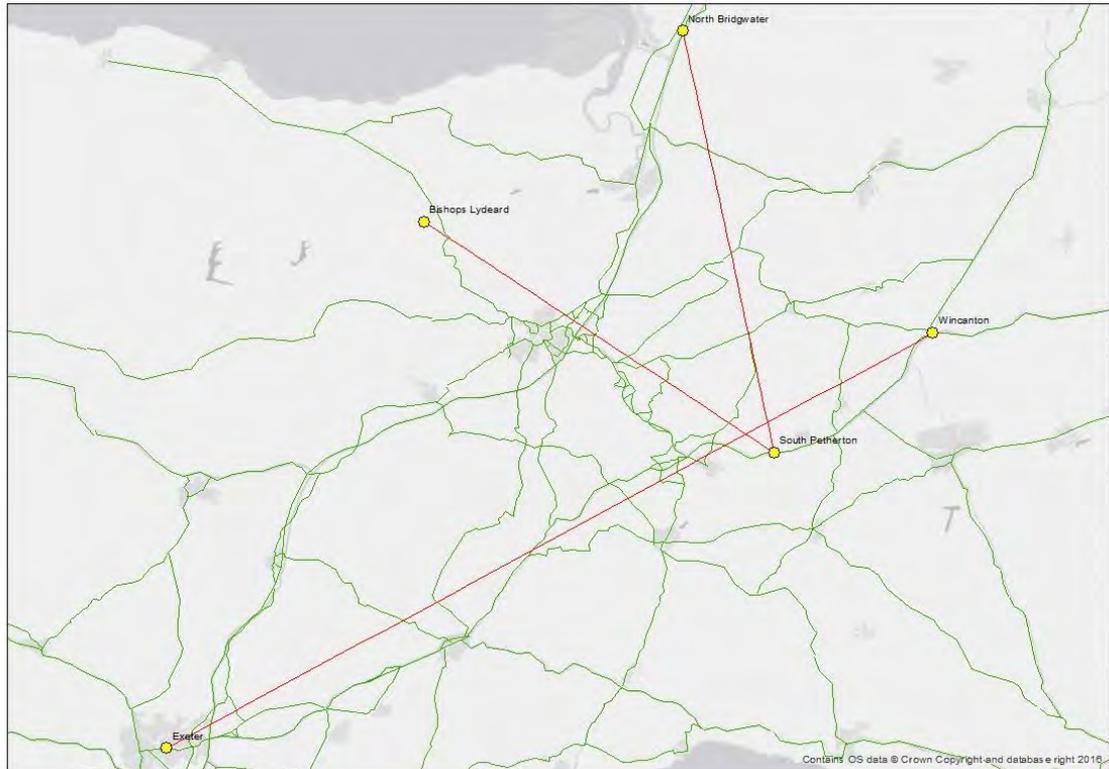
8.4.3. The forecast traffic for each of the options in Figure 8.8 to Figure 8.13 contain the Most Likely/Central growth scenario only, and does not include forecasts for Low or High sensitivity test forecasts at this stage. These sensitivity tests will need to be undertaken in the next stage.

Analysis of Journey Times

Journey times at the corridor level

8.4.4. Highway journey times between four locations on strategic routes were studied. The locations are shown in Figure 8.6.

Figure 8.6: Origin and destinations of pairs used for the strategic route journey time analysis



8.4.5. The 3 journey time routes studied were:

- **Route 1:** A303 / A30 East to West: Wincanton to Exeter
- **Route 2:** A303 / A358 South to North: South Petherton to A358 north of Taunton (Bishops Lydeard)
- **Route 3:** A303 / A358 / M5 South to North: South Petherton to M5 north of Bridgwater

8.4.6. Table 8.1 to Table 8.4 show a comparison of average journey times for the AM peak and PM peak periods respectively. These are arithmetic means of the journey time for both directions. These tables show the journey times for the Do Minimum and the Do Something scenarios for the forecast years together with the percentage changes for the Do Something compared with the Do Minimum scenario.

8.4.7. The data show that for both the AM and PM peak periods there is a small increase in journey times on the A303 / A30 between Wincanton and Exeter, which may be due to increased congestion at the Southfields Roundabout under the new configuration. For both routes between the A303 to the east of the Southfields junction via the A358, i.e. routes 2 and 3, there is a decrease in journey times for both the AM and PM peak periods.

Table 8.1: Average Journey Times Car Commute Trips – 2023 AM Peak (hour:mins)

Route	Do Minimum	Pink option		Blue option		Orange option	
		Journey Time	% Change	Journey Time	% Change	Journey Time	% Change
1	00:59	01:01	3%	01:01	4%	01:00	2%
2	00:38	00:30	-19%	00:31	-18%	00:33	-12%
3	00:40	00:31	-22%	00:31	-21%	00:32	-19%

Table 8.2: Average Journey Times Car Commute Trips – 2038 AM Peak (hour:mins)

Route	Do Minimum	Pink option		Blue option		Orange option	
		Journey Time	% Change	Journey Time	% Change	Journey Time	% Change
1	01:03	01:05	3%	01:06	4%	01:05	3%
2	00:40	00:34	-15%	00:34	-15%	00:36	-12%
3	00:44	00:36	-18%	00:36	-17%	00:36	-17%

Table 8.3: Average Journey Times Car Commute Trips – 2023 PM Peak (hour:mins)

Route	Do Minimum	Pink option		Blue option		Orange option	
		Journey Time	% Change	Journey Time	% Change	Journey Time	% Change
1	00:58	00:59	1%	00:59	2%	00:58	0%
2	00:36	00:29	-19%	00:29	-18%	00:32	-10%
3	00:37	00:30	-19%	00:30	-18%	00:31	-16%

Table 8.4: Average Journey Times Car Commute Trips – 2038 PM Peak (hour:mins)

Route	Do Minimum	Pink option		Blue option		Orange option	
		Journey Time	% Change	Journey Time	% Change	Journey Time	% Change
1	01:01	01:02	2%	01:03	3%	01:02	1%
2	00:38	00:30	-20%	00:31	-18%	00:32	-15%
3	00:39	00:31	-21%	00:31	-20%	00:32	-19%

8.4.8. Analysis of these strategic journey time demonstrates that each of the 3 scheme options would improve access times along the A358 corridor between the A303 at Ilminster and the M5 at Taunton.

- 8.4.9. For traffic travelling between the A303 east of the Southfields Roundabout junction to the north of Taunton via the A358, i.e. routes 2 and 3, journey time savings of 12%-18% during the AM period and 15%-21% during the PM period are forecast for with the 3 options along these routes in 2038. These results are for an average neutral weekday, which are likely to be greater during the higher flows experienced particularly during busy summer weekends.
- 8.4.10. For traffic travelling between the A303 east of the Southfields Roundabout junction to the M5 at junction 29 (Wincanton-Exeter) along the A303 and A30 there is a slight increase in forecast journey times, with an increase in journey time of 3%-4% during the AM period and 1%-3% during the PM period being forecast across the 3 options in 2038. This slight increase in journey times is a result of the increased levels of congestion at the Southfields Roundabout and again would likely be greater during busy summer weekends. The analysis at this stage did not include improvements to Southfields Roundabout, however improvements to address these negative impacts would be considered in further scheme development during later stages of development.

Journey times at the scheme level between the Southfields Roundabout and the M5

- 8.4.11. Journey times along the existing and new A358 between Southfields Roundabout and the M5 are summarised in Table 8.5. This shows average peak period journey times for three shorter routes between Southfields Roundabout and M5 Junction 26 (to the south of junction 25), M5 Junction 24 (north of junction 25) and Taunton (M5 junction 25). The times are shown for the design year 2038 taken from the local highway traffic model. The same data is presented graphically in Figure 8.7.
- 8.4.12. All journeys between the M5 and Southfields show substantial journey time savings for the scheme options when compared to the journey times in 2038 for the Do Minimum scenario.
- 8.4.13. The journey times between the options would be similar. The changes are summarised below, averaged across the three routes.
- In the AM-Peak period
 - The Pink option showed a 46% (~12 min 6 sec) and 45% (~11 min 11 sec) improvement in journey time in the eastbound and westbound directions respectively
 - The Blue option showed a 44% (~11 min 24 sec) and 43% (~10 min 34 sec) improvement in journey time in the eastbound and westbound directions respectively
 - The Orange option (via the new all-movement junction) showed a 44% (~11 min 37 sec) and 43% (~10 min 35 sec) improvement in journey time in the eastbound and westbound directions respectively

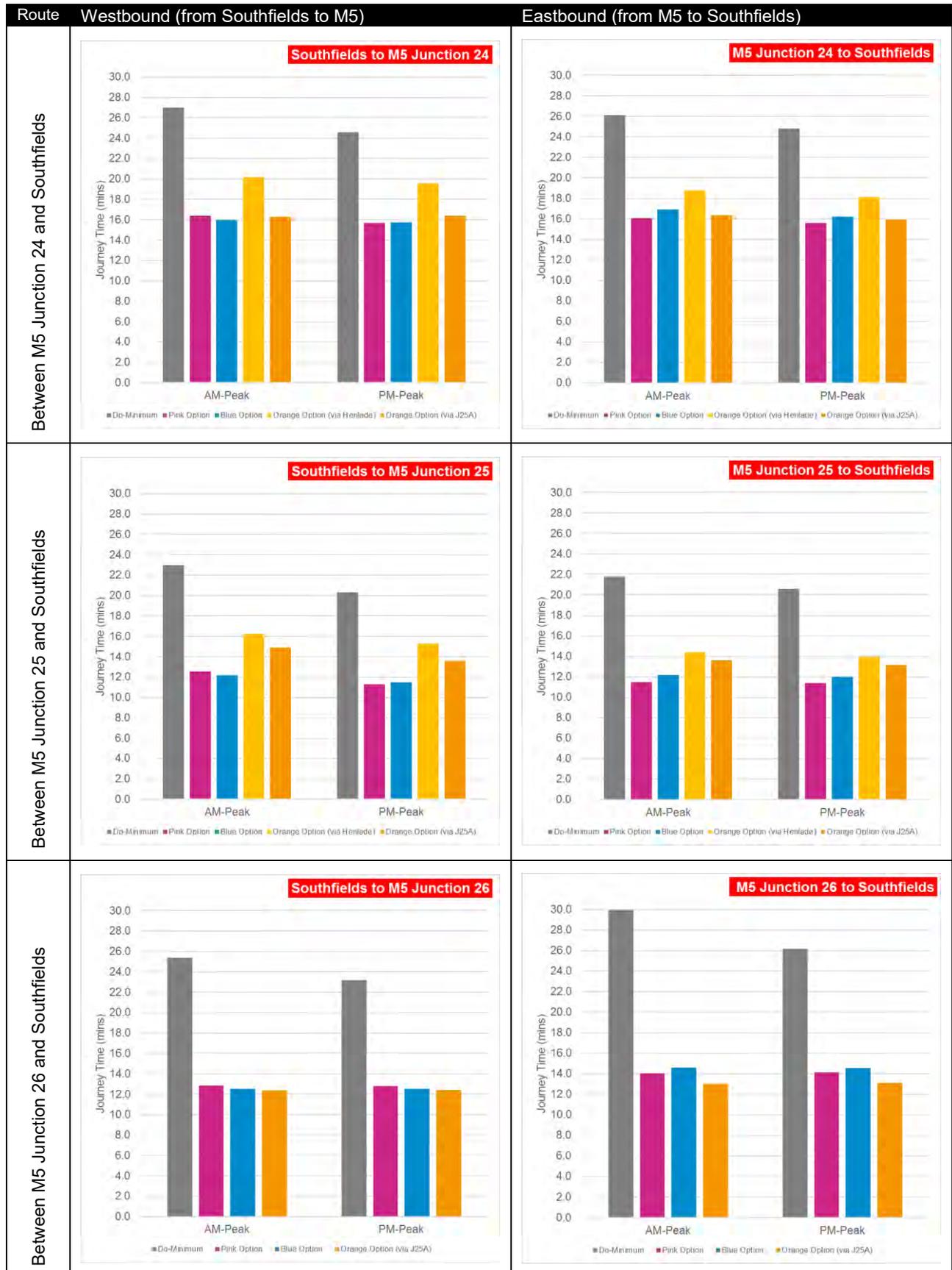
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- In the PM-Peak period
 - The Pink option showed a 43% (~10 min 8 sec) and 42% (~9 min 26 sec) improvement in journey time in the eastbound and westbound directions respectively
 - The Blue option showed a 40% (~9 min 36 sec) and 41% (~9 min 16 sec) improvement in journey time in the eastbound and westbound directions respectively
 - The Orange option (via the new all-movement junction) showed a 40% (~9 min 47 sec) and 39% (~8 min 33 sec) improvement in journey time in the eastbound and westbound directions respectively

8.4.14. The figures indicate that for the Orange option, journey times are shorter travelling through the new proposed all-movement junction than through Henlade (the route via the new junction is shown by the orange column and via Junction 25 by the yellow column in the figure below).

Table 8.5: Summary of average peak period journey times and changes in average peak period journey times between Southfields Roundabout and M5 Junction 26, Junction 24 and Taunton (M5 Junction 25) in 2038

Route		Do Minimum	Pink option			Blue option			Orange option (via Henlade)			Orange option (via J25A)			
			Journey Time (min:sec)	Difference (min:sec)	% change	Journey Time (min:sec)	Difference (min:sec)	% change	Journey Time (min:sec)	Difference (min:sec)	% change	Journey Time (min:sec)	Difference (min:sec)	% change	
Eastbound	M5 J26 to Southfields	AM-Peak	29:57	14:02	-15:54	-53%	14:35	-15:22	-51%	--	--	--	13:01	-16:56	-57%
		PM-Peak	26:10	14:06	-12:04	-46%	14:31	-11:39	-45%	--	--	--	13:06	-13:04	-50%
	M5 J25 to Southfields	AM-Peak	21:48	11:27	-10:20	-47%	12:10	-09:38	-44%	14:24	-07:23	-34%	13:36	-08:11	-38%
		PM-Peak	20:34	11:23	-09:11	-45%	11:58	-08:35	-42%	13:54	-06:39	-32%	13:07	-07:26	-36%
	M5 J24 to Southfields	AM-Peak	26:07	16:04	-10:02	-38%	16:53	-09:13	-35%	18:47	-07:20	-28%	16:21	-09:45	-37%
		PM-Peak	24:47	15:36	-09:11	-37%	16:11	-08:35	-35%	18:08	-06:39	-27%	15:56	-08:50	-36%
Westbound	Southfields to M5 J26	AM-Peak	25:21	12:49	-12:32	-49%	12:30	-12:51	-51%	--	--	--	12:23	-12:58	-51%
		PM-Peak	23:11	12:47	-10:23	-45%	12:32	-10:39	-46%	--	--	--	12:24	-10:46	-47%
	Southfields to M5 J25	AM-Peak	22:59	12:33	-10:26	-45%	12:11	-10:48	-47%	16:13	-06:46	-29%	14:53	-08:06	-35%
		PM-Peak	20:18	11:17	-09:01	-44%	11:29	-08:49	-43%	15:15	-05:03	-25%	13:34	-06:43	-33%
	Southfields to M5 J24	AM-Peak	26:59	16:24	-10:34	-39%	15:58	-11:00	-41%	20:09	-06:49	-25%	16:18	-10:40	-40%
		PM-Peak	24:34	15:40	-08:53	-36%	15:45	-08:49	-36%	19:32	-05:01	-20%	16:23	-08:11	-33%

Figure 8.7: Average peak period journey times between Southfields Roundabout and M5 Junction 26, Junction 24 and Taunton (M5 Junction 25) in 2038



Operational Assessment of M5 junction 25 (all options) and proposed new all movements junction with M5 in the Orange option

8.4.15. The operational performance of the connections between the scheme options and the M5 is considered very important given the known existing operational problems at Junction 25 and the plans for an improvement to the junction to help accommodate traffic growth and development traffic. An initial operational assessment of M5 Junction 25 for the years 2023 and 2038 used peak period traffic forecasts averaged over the 3 hours in each of the AM and PM peak periods. Assessments were carried out for scenarios without the A358 scheme and with each of the options. The assessments indicated that:

- Junction 25 would operate satisfactorily with the improvement proposed by Somerset County Council in connection with the Nexus 25 development; that is, a provision for a signal controlled gyratory that comprises 4 circulating lanes on the roundabout instead of 3, as well as additional capacity on the entry approaches from Taunton and the M5 southbound off-slip road onto Junction 25.
- The analysis using LINSIG (Linear Signal Analysis) showed that with average peak period traffic flows degrees of saturation would be around 85% in 2038 with the options, compared with a desirable maximum of 90% for traffic signal control.

8.4.16. Further analysis for 2023 and 2038 has been undertaken using highest peak hour traffic forecasts; these represent the highest hourly traffic levels in the AM and PM 3-hour peak periods. Using these peak hour traffic forecasts derived from the traffic model, the LINSIG assessment showed the following:

Do-Minimum peak-hour analysis¹¹

8.4.17. The improved junction's capacity in the Do Minimum scenario would be significantly exceeded (degree of saturation higher than 100%) in the AM peak on the A358 eastern approach, in both opening and design years (2023 and 2038). In 2038 the A358 eastern approach will have:

- In the AM peak, a degree of saturation reaching 140%
- In the PM peak, a degree of saturation reaching 113%

Do-Something peak-hour analysis

8.4.18. All three options would result in the removal of traffic from Junction 25 between M5 south and the new A358 scheme. However, the Orange option results in the largest traffic reduction compared with the Do Minimum.

8.4.19. In the AM peak, with the Pink and Blue options, there are still overcapacity issues on the new link into Junction 25.

¹¹ The 'Do-Minimum' scenario reflects the traffic impacts should no scheme be built.

8.4.20. In 2038, during the AM-Peak, there are some circulation capacity issues for all options which means that queuing traffic on the roundabout circulation links may exceed the available storage capacity and this would need to be addressed further during the detailed design and operational control of the signal controlled roundabout improvement to avoid the junction 'locking up'. The A358 eastern approach performance is summarised as follows and for the Pink and Blue options this refers to the new link road approach whilst for the Orange option this is for the existing A358 approach:

- The Pink option will have a degree of saturation of 138%
- The Blue option will have a degree of saturation of 132%
- The Orange option will have a degree of saturation of 79%

8.4.21. Degrees of saturation for the entry approaches to the junction are all below 90% in the PM peak/Inter-peak hours except for the entry approach from Taunton in 2038 PM in the Blue option (degree of saturation of 93%)

8.4.22. There are some circulation capacity issues in both 2023 and 2038 and as explained above these will need to be further addressed.

8.4.23. Notwithstanding the capacity issues in 2023 and 2038 on both the junction entry approaches and the capacity limitations for some of the circulation lanes within the roundabout, it is possible to summarise the **overall** junction performance as follows:

- The Orange option relieves Junction 25 and provides better performance than the other options or the Do Minimum scenario;
- The Pink and Blue options provide similar operational performance which in the AM peak is overcapacity and similar to the Do Minimum, but below or close to capacity in the PM peak.

8.4.24. It should be noted that the traffic forecasts are preliminary at this early stage in the scheme's development, and will be updated in future by forecasts from the new South West Regional Traffic Model that will account for wider area reassignment and variable demand modelling. It will also be possible to refine the LINSIG optimisation of the forecasts further, although these assessments are considered to give reasonable indications of peak period and peak hour performance.

For the Orange option, an ARCADY analysis of the operational performance of the proposed new all movements junction with M5 was assessed. This showed that for peak period design year 2038 traffic forecasts that the ratio of flow to capacity would be 0.46 for both peak periods. The acceptable limiting value is usually taken as 0.85 for roundabouts so there would be considerable spare capacity available.

Figure 8.8: AADT Traffic Flows (Vehicles) – Pink option Model Area

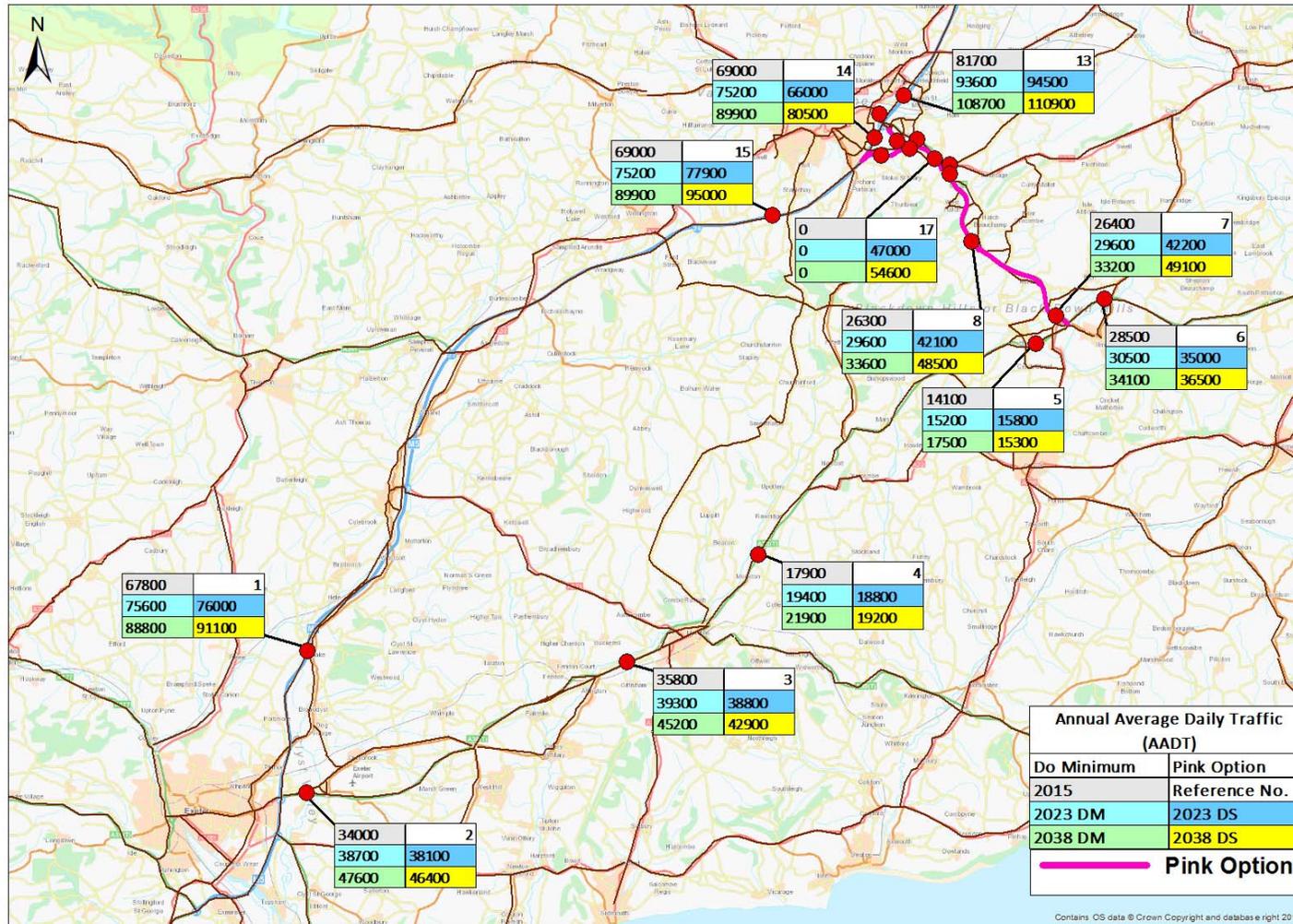


Figure 8.9: AADT Traffic Flows (Vehicles) – Pink option Scheme Area

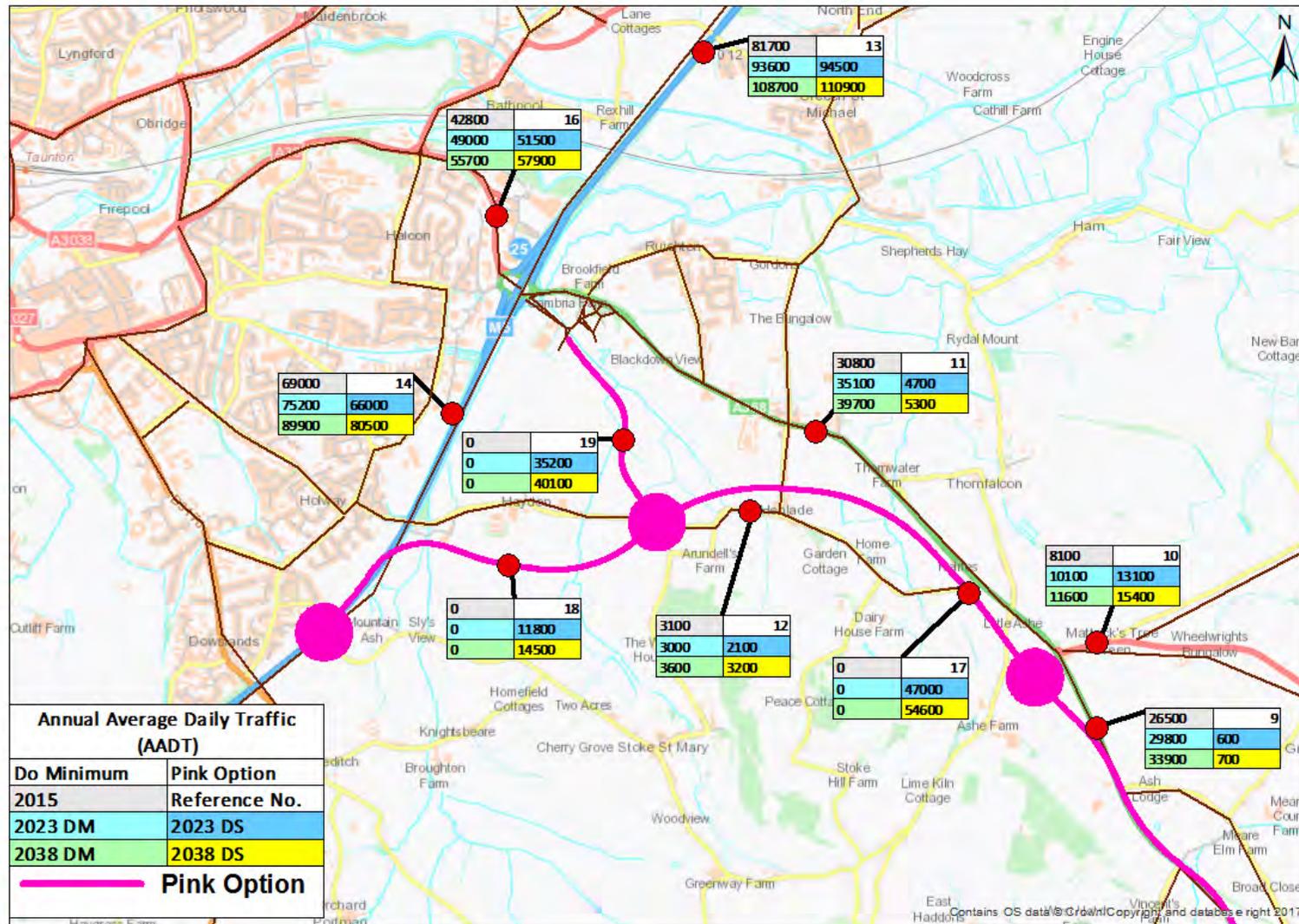


Figure 8.10: AADT Traffic Flows (Vehicles) – Blue option: Model Area

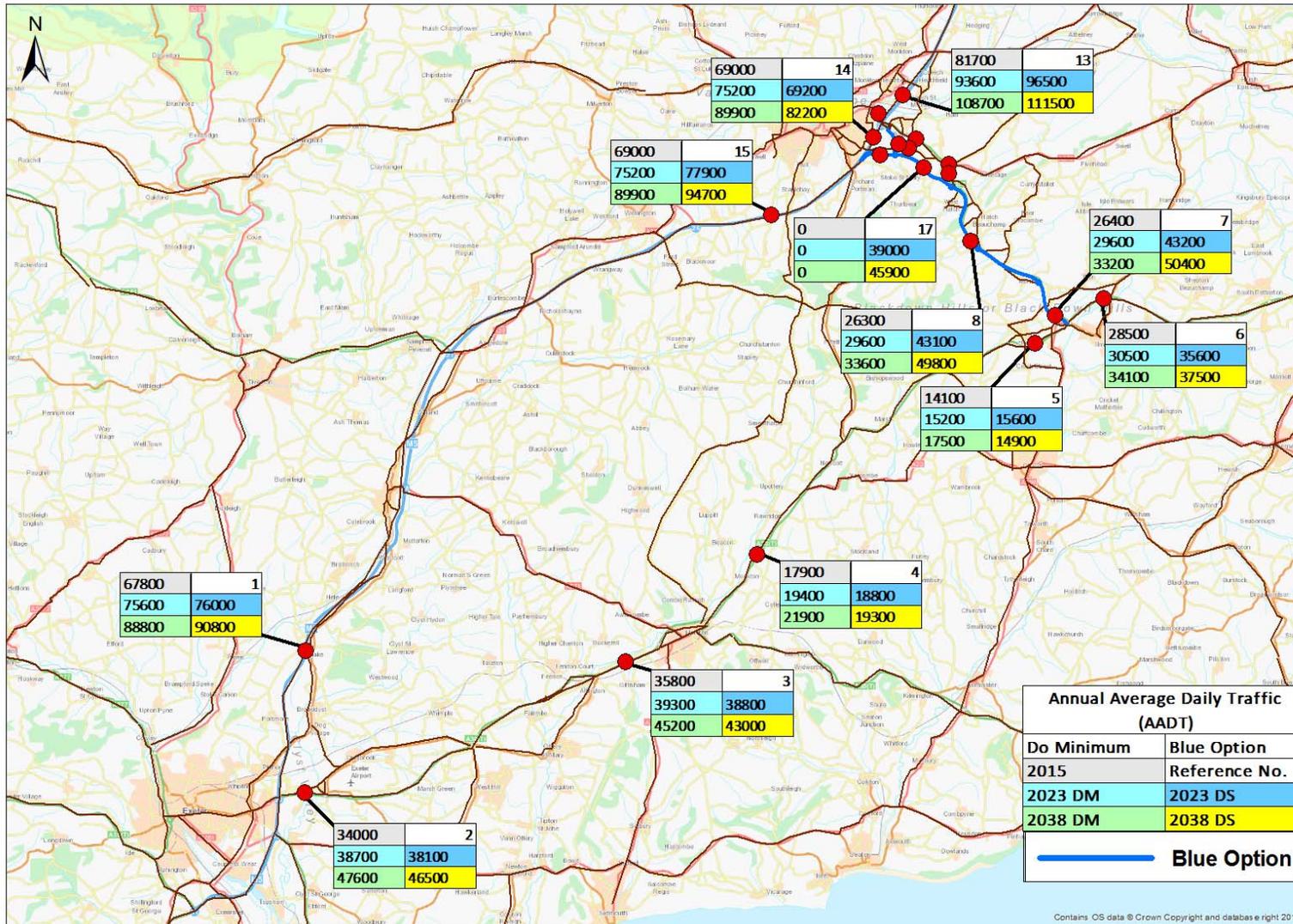


Figure 8.11: AADT Traffic Flows (Vehicles) – Blue option: Scheme Area

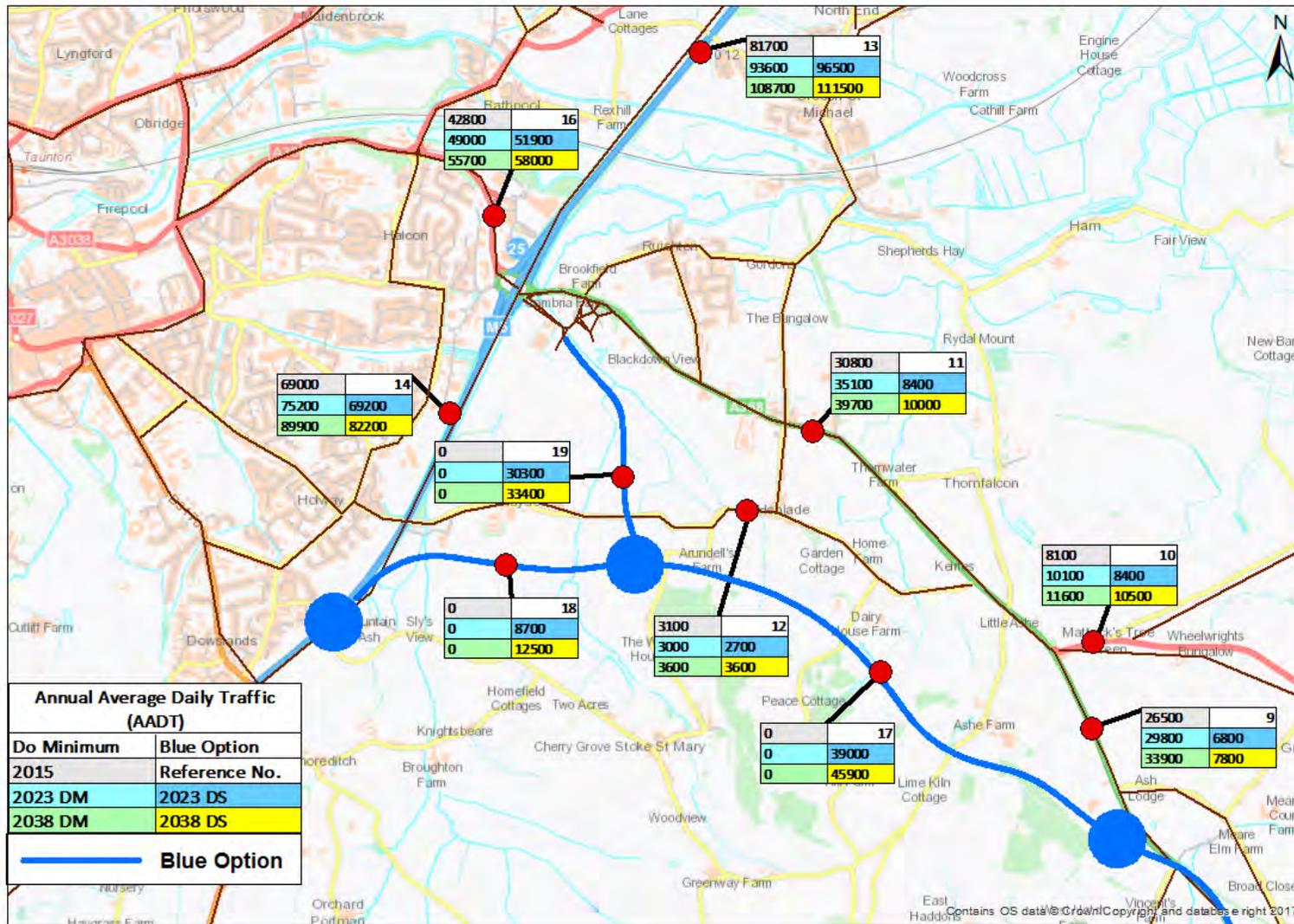


Figure 8.12: AADT Traffic Flows (Vehicles) – Orange option: Model Area

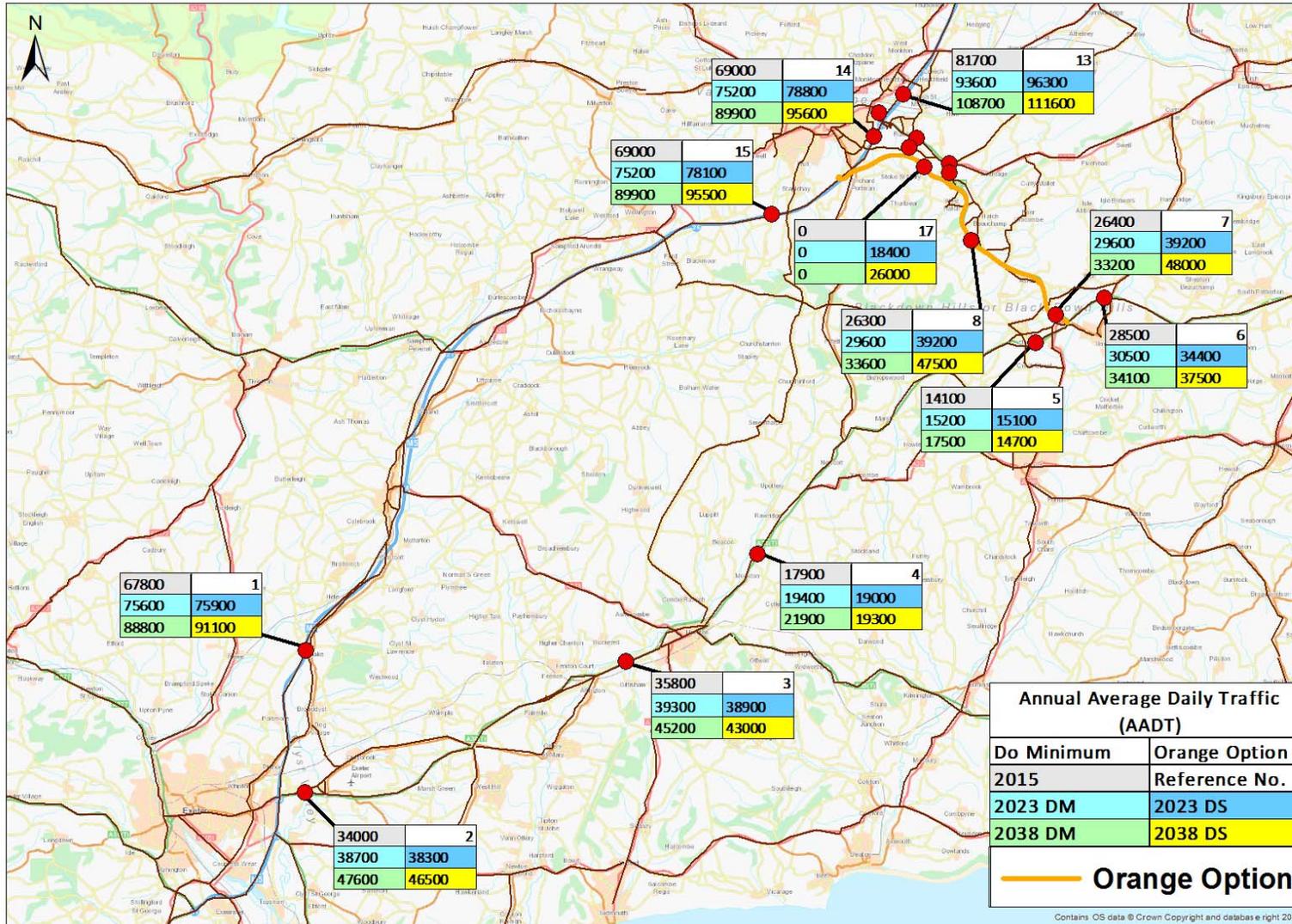
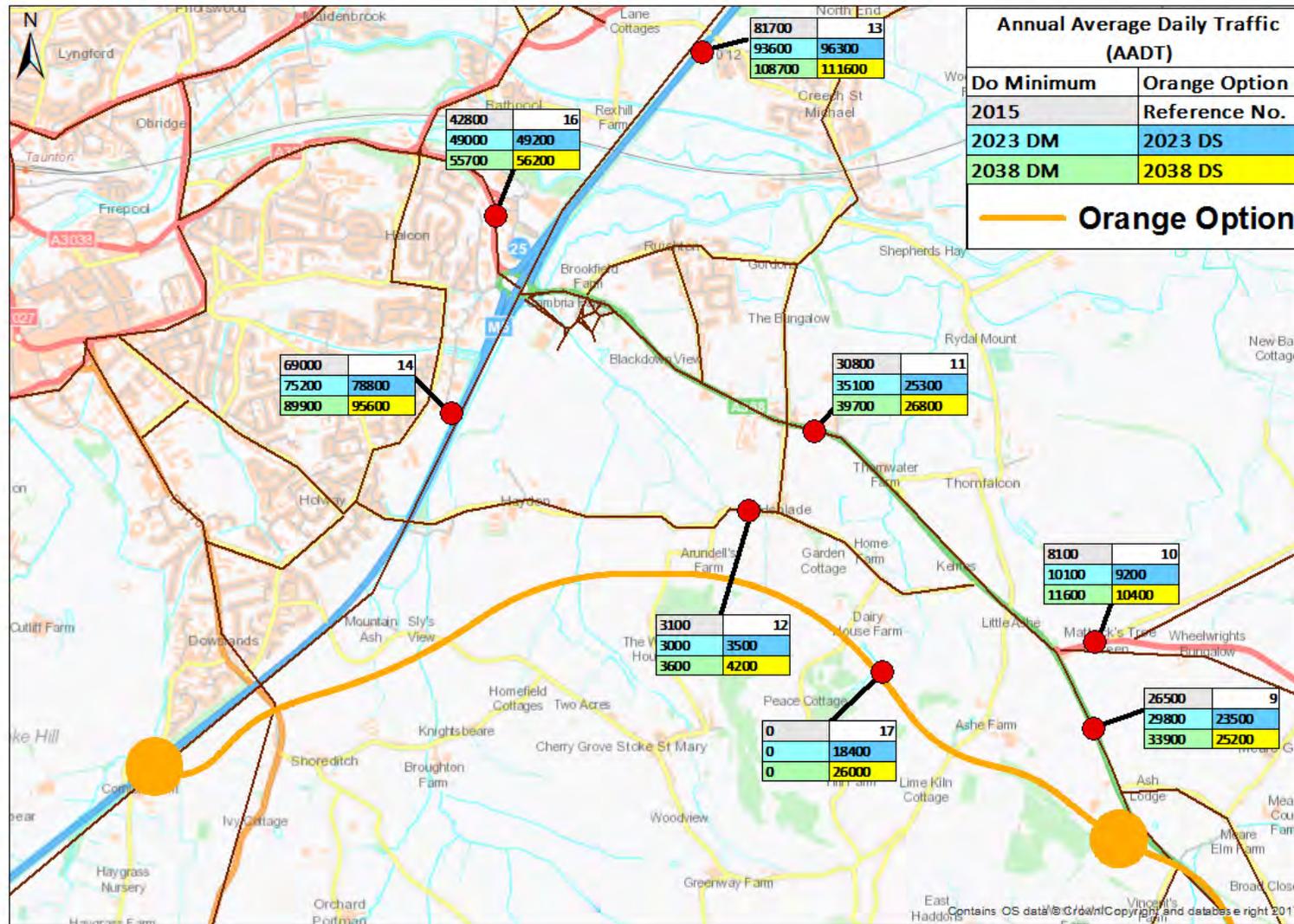


Figure 8.13: AADT Traffic Flows (Vehicles) – Orange option: Scheme Area



9. Road layout and standards

9.1. Standards used

- 9.1.1. The geometric design of the proposed A358 main carriageway and associated junction connector roads has been developed in accordance with the Design Manual for Roads and Bridges (DMRB) Volume 6. In particular, the following Design Standards have been used:
- TD9/93 Highway Link Design (DMRB 6.1.1)
 - TD27/05 Cross Sections and Headroom (DMRB 6.1.2)
 - TD22/06 Layout of Grade Separated Junctions (DMRB 6.2.1)
- 9.1.2. Principles of DMRB Volume 6 will also be applied to the design of local roads although this approach is subject to agreement with the local highway authority, Somerset County Council. Relaxations from the requirements of the DMRB may be necessary along local roads to ensure these works are appropriate to their standard and character.

9.2. Road geometry

- 9.2.1. The design speed for each link has been selected in accordance with the references in Table 9.1 below.

Table 9.1: Link design speeds

Link Type	Design Speed (km/h)	Reference
Mainline	120A	TD9/93 Table 3
Connector roads	85	TD22/06 Table 4/1
Slip Roads	70	TD22/06 Table 4/1
Dumb-bell Link Roads	70	TD22/06 Table 4/1
Single Carriageways	-	To be selected on a case by case basis, depending on location and adopting authority requirements
Compact Connectors	30	TD40/94 Paragraph 6.5

9.3. Cross sections

- 9.3.1. The dual carriageway sections will be designed as Dual 2 Lane All-Purpose (D2AP) carriageways as detailed in Figure 4-3a in TD27/05, "Cross Sections and Headroom".
- 9.3.2. Headroom clearances are also determined from this standard. It is expected that the road improvement will become an abnormal and indivisible loads (AIL) route and headroom clearances for overbridges will be designed accordingly.
- 9.3.3. It is possible that a rigid (concrete) vehicle restraint system may be selected for the central reserve as an alternative to a flexible (steel) system that is conventionally used on D2AP carriageways.

- 9.3.4. Single carriageway sections will generally be single carriageway (S2) standard as detailed in Figure 4-3a in TD27/05. However, in many cases these cross-sectional standards may be relaxed by agreement with Somerset County Council to ensure works to local roads are appropriate to the standard and character of adjacent existing roads.

9.4. Junction strategy: location and layout

- 9.4.1. The suggested locations of the provisional junctions are provided in Table 9.2 below.

Table 9.2: Junction locations

Option	Junction	For travel between the upgraded A358 and ...
Pink option	M5	M5 South
	Henlade	Taunton and M5 junction 25
	Mattock's Tree Green	Hatch Beauchamp, Henlade and surrounding communities A378
	Ashill	Ashill, Ilton and surrounding communities
	Southfields Roundabout	A303 South, A358 South and Ilminster
Blue option	M5	M5 South
	Henlade	Taunton and M5 junction 25
	West Hatch Lane	Hatch Beauchamp, West Hatch and surrounding communities A378 via retained A358 carriageway
	Ashill	Ashill, Ilton and surround communities
	Southfields Roundabout	A303 South, A358 South and Ilminster
Orange option	M5	M5 South and North
	West Hatch Lane	Hatch Beauchamp, West Hatch and surrounding communities Taunton and A378 via retained A358 carriageway
	Ashill	Ashill, Ilton and surround communities
	Southfields Roundabout	A303 South, A358 South and Ilminster

- 9.4.2. An early assessment has been made to determine whether full grade-separation standards (in accordance with TD22/06) or compact grade-separation (in accordance with TD40/94) would be most appropriate. In view of the likely high mainline flows that are expected all junctions are currently designed to full grade-separation standards with the exception of Southfields Roundabout which will be slightly modified to accommodate the new A358 dual carriageway. (Larger-scale improvements to Southfields Roundabout will be considered as part of the future A303 South Petherton to Southfields scheme, which will extend the A303 / A358 corridor improvements past Ilminster, upgrading the existing single carriageway to dual carriageway).

10. Economic assessment

10.1. Application of TUBA/COBA

- 10.1.1. The DfT's Transport Analysis Guidance (WebTAG) provides a detailed methodology for quantifying a wide range of potential impacts of a transport scheme and monetising them wherever possible. According to the WebTAG guidelines, the potential impacts of the improvements are categorised under the main objectives as Economy, Environment, Society and Public Accounts. These objectives are further subdivided into sub-objectives. The economic assessment of the A358 Taunton to Ilminster scheme assesses impacts according to the guidelines and the results are summarised in an Appraisal Summary Table (AST) included at Appendix D.
- 10.1.2. An assessment of the wider economic impacts has also been undertaken. This approach has been carried out using TEAM (Mott MacDonald's Transparent Economic Assessment Model). This indicates that the wider economic impacts are positive and likely to be significant for the local economy (630 jobs and £37.7m of annual Gross Value Added (GVA)), providing further justification for the scheme. However, the current guidance recommends that these benefits may be used only to support the strategic case and not the economic case.
- 10.1.3. The transport users' economic appraisal has been undertaken using the computer program TUBA (Transport Users Benefit Appraisal) Version 1.9.8, with an updated economics file to take on board changes in the November 2016 WebTAG guidance. Using trip and cost matrices from the traffic model, TUBA calculates user benefits and produces results for various degrees of disaggregation and summarises the outputs. For calculating accident benefits COBALT (Cost and Benefit of Accidents – Light Touch) Version 13_02 was used. For calculating benefits caused by queues and delays as a result of scheme construction, the QUADRO version 14 (QUEues And Delays at ROadworks) program was used. With both programs, the latest 2016 economics files were used to comply with the November 2016 WebTAG guidance. Journey time reliability has been assessed using the method set out in TAG A1.3 Appendix C.5.
- 10.1.4. The economic analysis is based on matrices from the application of a fixed trip matrix on an origin-destination basis using the local SATURN (Simulation and Assignment of Traffic to Urban Road Networks) traffic model. The economic appraisal has been carried out for a scenario that uses National Trip End Model (NTEM) 7.0 growth rates with attraction of planned local developments also taken into account.
- 10.1.5. Other impacts such as noise, air quality and greenhouse gases have also been monetised. These impacts are described in Section 10 of this report and summarised in the Appraisal Summary Table (AST) (Appendix D).

TUBA assumptions

- 10.1.6. The appraisal is based on matrices of trips and costs extracted from the transport model. From these, TUBA calculates the user benefits in time, fuel vehicle operating costs (VOC), non-fuel VOC and charges. Scheme costs are input and both benefits and costs are discounted by TUBA to the present value year (2010) in accordance with WebTAG unit A1.1 paragraph 2.7.6.
- 10.1.7. Table 10.1 presents a comparison of scheme costs for levels of probability to account for risk and uncertainty. These are in 2014 Quarter 1 prices.

Table 10.1: Comparison of scheme costs

2014 Q1 prices [£]	P10	P50	P90
Pink option	329,054,621	451,760,360	661,276,892
Blue option	323,792,276	400,820,487	532,873,082
Orange option	297,515,215	366,106,661	492,768,063

- 10.1.8. Table 10.2 summarises the costs for each option in 2010 prices (in the factor cost unit of account based on P50 estimates) as required by WebTAG for input to the economic appraisal. It should be noted that these costs will be lower than the initial scheme costs quoted at 2014 Q1 prices.

Table 10.2: Scheme Cost Summary (£, 2010 Prices)

Cost Type	Pink option	Blue option	Orange option
Preparation	£19,552,630	£20,964,160	£20,876,006
Supervision	£5,528,906	£5,046,075	£5,046,986
Works	£300,286,030	£275,674,261	£246,997,627
Land	£20,959,344	£23,200,964	£24,031,634
TOTAL	£346,326,909	£324,885,460	£296,952,253

- 10.1.9. The scheme costs range between £297m for the Orange option to £346m for the Pink option in 2010 prices and reflect the complexities and the uncertainties related to the schemes as more features are added. Maintenance and operation costs have not been included in the costs above and therefore the economic assessments exclude them at this stage.
- 10.1.10. TUBA has been used to appraise the 3 scheme options on the basis of a 2023 opening year. Forecasts have been produced for the opening year and 15 years later, 2038. The appraisal period is 60-years from scheme opening. Assumptions for the economic appraisal including economic parameters and annualisation factors that form inputs to the TUBA economic appraisal process include:
- After the year of 2038, user benefits are assumed not to grow and are subject to normal discounting to 2010 present value year and changes to other economic parameters.

- The economic analysis is based on a fixed origin-destination basis using the local SATURN traffic model.
- Any economic benefits are based on differences between the 'with' and 'without' scheme scenarios.
- Economic benefits are estimated for all hours and days of a full calendar year and have been derived from the weekday traffic models with off-peak and weekend benefits derived by a process of factoring.
- The final appraisal has been carried out on scenarios that have been grown by the NTEM 7.0 growth rates along with local planned developments having been accounted for to address the trip attraction of future developments in the area.
- Scheme option costs set out above have been assessed by Highway England's cost consultants Benchmark based on design information provided.

Accident assumptions in COBALT

- 10.1.11. COBALT (Cost and Benefits of Accidents – Light Touch) is the industry standard software provided by the Department for Transport which is used to derive the accident (or collision) impacts of a scheme. Accidents for the 5-year period (2010-14) were entered into the COBALT network along with the existing and future annual average daily traffic flows from the traffic model. Somerset and Devon County Council provided the accident data.
- 10.1.12. COBALT calculates existing accident rates based upon the Somerset County Council records and uses these to estimate future accident numbers in the Do-Minimum scenario, whilst rates for new carriageways in the scheme options are based upon default accident rates. COBALT then compares the predicted numbers of accidents with and without the scheme and converts them into monetary values by multiplying the numbers of accidents by their monetised costs.
- 10.1.13. COBALT outputs the accident benefits for the scheme over the 60-year appraisal period in 2010 prices and discounted to 2010.

Construction delay in QUADRO

- 10.1.14. Some delays to the local road network will be caused during the construction of the A358 dualling. Consequently, a QUADRO based economic assessment was performed to analyse the potential construction impact due to the implementation of the improvements.

- 10.1.15. This assessment assesses the dis-benefits caused by construction of each of the options taking account of the traffic management proposals during construction and the time periods for which they are expected to be in place. The dis-benefits occur as a result of roadworks causing delays to traffic (both due to physical presence of the works and any delays caused by breakdowns or accidents occurring within the works), leading to impacts on travel times, vehicle operating costs, carbon emissions and accident costs.
- 10.1.16. Delays due to maintenance are not being included as part of the QUADRO assessment at this options identification stage of the scheme as the maintenance profiles after construction are yet to be decided. Such details will be presented in the next scheme development stages. It should be noted that delays due to future maintenance activities are likely to decrease due to the increase in network capacity with the scheme.

Journey time reliability benefits using WebTAG A1.3 Appendix C.5

- 10.1.17. 'Reliable journeys' is one of the sub-objectives within the 'Economy' section of scheme appraisal and the estimate provided in this section is aimed at addressing this sub-objective for the A358 scheme. The term 'reliability' is often used interchangeably with 'travel time variability' or 'journey time variability'. The stress-based approach set out in TAG A1.3 Appendix C.5 has been used to assess journey time reliability benefits.
- 10.1.18. The predicted reliability benefits that have been calculated for the four modelled schemes are shown in Table 10.3.

Table 10.3: Predicted Reliability Benefits (£000's) – all DS options

	Pink option	Blue option	Orange option
Travel Time Benefits (60-years' appraisal period)	625,449	536,206	477,376
Reliability Impact	Moderate Beneficial	Moderate Beneficial	Moderate Beneficial
Reliability Percentage	10%	10%	10%
Reliability benefits	62,545	53,621	47,738

Notes: All monetary values are expressed in 2010 prices discounted to 2010

Noise

- 10.1.19. The noise appraisal has been undertaken in accordance with TAG unit A3 chapter 2. Net present values (NPV) have been calculated for changes in noise, amenity and several specific health issues. To derive the NPVs, calculated values within the respective option study areas required independent entries in the WebTAG Noise Worksheets for 'with' and 'without' scheme in both opening and design years. The study areas used in the calculations were consistent with the DMRB approach, which in broad terms has been determined by minimum changes of 1dB in a comparison between 'with' and 'without' scheme scenarios in the year of Opening, or the equivalent in the Design Year of 3dB. Therefore, the study areas for each option were different due to variations in traffic models.
- 10.1.20. Night-time noise has been calculated based on conversion from day-time to night-time using the relationship between day-time and night-time traffic flows identified within a Transport Research Laboratory report as discussed in DMRB. Owing to the preliminary stage of design, mitigation in the form of additional bunds or barriers has not been incorporated into the appraisal, and this has provided a more realistic reflection of overall benefits and dis-benefits.
- 10.1.21. As only a local traffic model has been produced at this stage which does not capture the changes that occur remote from the local area, for example reassignments from the M4 motorway, then a fixed matrix approach has been applied that excludes the wider area reassignment from the 'with scheme' case. This issue will be fully addressed in PCF Stage 2 with the application of the SWRTM whereby benefits from the traffic reductions remote from the study area can be accounted for in a regional assessment alongside the local impacts of wider area reassignment. The use of SWRTM will also account for variable demand modelling.

Air quality

- 10.1.22. The air quality appraisal has been undertaken in accordance with Transport Appraisal Guidance (TAG) unit A3 chapter 3. Net present values (NPV) have been calculated for both local and regional changes in air quality. To derive the NPV, calculations have only been undertaken in the air quality worksheets for any roads within 200 metres of the scheme options that meet the DMRB local air quality screening criteria in the traffic model. Such roads comprise: road alignment changes by 5 metres or more, daily traffic flow change by 1,000 Annual Average Daily Traffic (AADT) or more, heavy duty vehicle (HDV) flows, which comprise HGVs and buses, change by 200 AADT or more, daily average speeds change by 10km/h or more or peak hour speed change by 20km/h or more.

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- 10.1.23. A review of traffic data for the base year, opening year and design year 'with' and 'without scheme' scenarios has been undertaken with calculations taking into account AADT flows and average flows in the morning (07:00-10:00), inter-peak (10:00-16:00), evening (16:00-1900) and off-peak (19:00-07:00) periods including percentage of heavy duty vehicles (HDVs) and average speeds outputs for the preceding periods.
- 10.1.24. Changes in air quality have been appraised using the Department for Transport's Local Air Quality Workbook and Air Quality Valuation Workbook.
- 10.1.25. For the same reasons given above, the air quality assessment has used a fixed matrix approach that excludes the wider area reassignment estimate and variable demand modelling impacts which will be captured in the option selection stage with SWRTM.

Greenhouse gases

- 10.1.26. The greenhouse gases appraisal has been undertaken in accordance with TAG Unit A3 Chapter 4. To derive the NPV of change in carbon dioxide equivalent (CO_{2e}) emissions for each option, traffic data has been provided comprising AADT flows including percentage HGVs, average link speeds for the AADT period and link lengths for each scenario assessed. Traffic data was used to calculate vehicle emissions of greenhouse gases (as CO_{2e}) for the opening year and design year of the scheme using factors derived from the Department for Transport's WebTAG Databook v1.5. Linear interpolation was used to calculate vehicle emissions between 2023 and 2038; these values were input into the Department for Transport's Greenhouse Gases Workbook to calculate the NPV. In accordance with the economics appraisal, the greenhouse gas appraisal assumes no change in greenhouse gas emissions beyond 2037.
- 10.1.27. For the same reasons given above, the greenhouse gases assessment has used a fixed matrix approach that excludes the wider area reassignment estimate and variable demand modelling impacts which will be captured in PCF Stage 2 with SWRTM.

10.2. Accident savings

- 10.2.1. The accident savings for each option, which contribute to the analysis of monetised cost benefits over a 60 year appraisal period are reproduced in Table 10.4.

10.2.2. The current accident assessment has been calculated on a preliminary basis using inputs from the local traffic model. Further development of the scheme will be informed by the traffic forecasts derived from an adapted version of the South West Regional Traffic Model which will assess traffic impacts over a wider area as well as accounting for variable demand choices, such as change of mode or trip redistribution in response to changing travel costs. While the current assessment is robust for comparing the options at this early stage in the scheme's development and providing an indication of which options are likely to produce greater accident benefits, the actual values are subject to change. Some preliminary tests using data from the expanded model in the accident assessment indicates that positive accident benefits would be produced for the Orange option, along with higher benefits for the other options, so the relative rankings would remain unchanged.

Table 10.4: Predicted accident savings based on local accident rates

Number of Personal Injury Accidents savings	Severity	Pink option	Blue option	Orange option
Casualties	Fatal	-0.9	-1.3	-1.2
	Serious	47.4	43.44	16.8
	Slight	253.6	255.0	-97.6
Value of accident savings (£000's in 2010 prices discounted to 2010)		£10,183	£9,666	-£314

10.3. Results of the economic appraisal

- 10.3.1. The overall impacts are summarised in the Analysis of Monetised Costs and Benefits table, which includes all results from the TUBA, COBALT and QUADRO programs as well as the WebTAG based assessments for reliability, noise, air quality and greenhouse gases. These are shown in Table 10.5.
- 10.3.2. The Net Present Value (NPV) results indicate that all the options provide value for money. The options will result in Benefit Cost Ratios (BCR) between 1.44 and 1.86 with the initial BCR and between 1.64 and 2.08 with the adjusted BCR that includes reliability benefits. Under the Department for Transport's value for money criteria, these represent medium to high value for money with the BCR around the BCR threshold of 2.0 between medium and high value for money. However, it should also be noted that the assessment of wider economic benefits undertaken with TEAM (see paragraph 10.1.2) shows that the scheme would support benefits which are likely to be significant for the local economy (630 jobs and £37.7m of annual Gross Value Added (GVA)), providing further justification for the scheme.

Table 10.5: Analysis of Monetised Cost Benefits (£000's)

Item	Pink option	Blue option	Orange option
Accidents (not assessed by TUBA) ¹	10,184	9,666	-314
Roadworks (not assessed by TUBA) ²	-58,676	-54,691	-54,916
Greenhouse Gases (not assessed by TUBA) ³	-18,969	-16,589	-21,791
Noise (not assessed by TUBA) ⁴	493	2204	-837
Air Quality (not assessed by TUBA) ⁵	-136	180	71
Economic Efficiency: Consumer Users (Commuting)	122,843	108,557	95,830
Economic Efficiency: Consumer Users (Other)	159,928	127,916	98,781
Economic Efficiency: Business Users and Providers	283,355	239,090	200,801
Wider Public Finances (Indirect Taxation Revenues)	30,474	28,412	33,533
Present Value of Benefits (PVB)	529,496	444,745	351,158
Broad Transport Budget/Present Value of Costs (PVC)	284,094	266,270	243,851
OVERALL IMPACTS			
Net Present Value (NPV)	245,401	178,475	107,307
Initial Benefit to Cost Ratio (BCR)	1.864	1.670	1.440
Reliability Benefits	62,375	53,621	47,738
Adjusted BCR	2.084	1.872	1.636

Notes: All monetary values are expressed in 2010 prices discounted to 2010 1 - From COBALT, 2 -From QUADRO 4 -TAG Unit A3 Chapter 2,4 - TAG Unit A3 Chapter 3,5 - TAG Unit A3 Chapter 4

11. Safety assessment

11.1. Impact on road user – strategic safety action plan

Introduction

11.1.1. A high-level safety review has been undertaken for the 3 alignment options for A358 Taunton to Southfields Roundabout Route Improvement scheme. This section sets out the findings of that review.

Highways England Policy

11.1.2. Highways England is a Government owned public sector company whose primary role is to operate, maintain and improve the strategic road network. A key measure of its performance involves making its network a safer place, both to use and on which to work. Highways England acknowledges that it cannot entirely eliminate risk on the road network but that it can recognise risk, assess it and implement any controls which are reasonably required.

11.1.3. Highways England has been set a target by the Government to achieve a 40% reduction in the number of Killed or Seriously Injured (KSI) accidents by 2020, with a longer-term aim being to get as close as possible to zero by 2040.

11.1.4. The Highways England document 'Health and Safety, Our Approach' (2015) identifies 3 at-risk populations that it is responsible for (excluding its employees working away from offices):

- Road users
- Customer operations staff (eg Traffic Officers)
- Road workers and other supply chain employees

11.1.5. The design process for this scheme should at all times consider the safety of these populations.

11.1.6. The scheme objectives are identified in the Client Scheme Requirements (see Section 2). For safety, the objectives are:

- Improve safety along the A303 / A358 / A30 corridor
- Improve safety along the A358 Taunton to Southfields Roundabout route for non-motorised users (NMUs)
- The selection of more prescriptive safety objectives for the scheme will be set out in more detail in the Safety Plan which will be prepared later in the scheme programme. The Plan is expected to include:
 - For road users (which includes walkers, cyclists and equestrians), the safety objective is a reduction in Personal Injury Collisions and no increase in severity ratio

- For road workers, risks will be managed to be ‘tolerable’ (see the Health and Safety Executive’s ‘Tolerability of Risk’ model), with the aim to implement reasonably practicable control measures to drive residual risk towards the ‘broadly acceptable’ region

11.2. Buildability

Introduction

11.2.1. Potential health, safety and wellbeing factors were considered during the initial sifting process. On-going design developments will continue to address health, safety and wellbeing goals through a structured approach in accordance with the following publications:

- *Construction (Design and Management) Regulations 2015*. These regulations require that hazards and risks are identified and eliminated or reduced as part of the design process and, if elimination is not possible, for information to be provided regarding the nature of the residual risks.
- *Interim Advice Note 69/15 Design for Maintenance (Highways England, April 2015)*. This document provides guidance on the risk assessment and liaison process regarding the development of designs that are safe to maintain. The intent is to identify the key features relating to maintenance activities which:
 - Must be undertaken in a particular manner
 - Do not have an obvious approach
 - Are hazardous to those undertaking the work or others who may be affected by it
 - Require a disciplined approach

11.2.2. During the design process reference was made to feedback regarding lessons learnt from latest working and operating practices from forums such as the Road Worker Safety Forum (RoWSaF), Safe Use of Roadside Verges in Vehicular Emergencies (SURVIVE) as well as circulars such as Highways England Safety Alerts and Monthly Health Safety and Wellbeing Briefings to ensure developing designs take account of the current experience.

Traffic Management

11.2.3. Highways England obtained initial advice from contractors specialising in constructing highway works to understand how traffic on the A358, A303 and M5 may be managed during the construction of the scheme.

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- 11.2.4. It was determined that the width of the lanes on the existing A358 could be reduced to 3.25 metres and that a temporary speed limit of 40 mph could be applied throughout the online widening sections. Depending upon the nature of the separate scheme for the improvement of Southfields Roundabout it may be necessary to reduce the width of the A303 Ilminster Bypass to 1 lane in each direction, and to apply a temporary speed limit of 40mph.
- 11.2.5. During the construction of any new junction on the M5, motorway lanes could be reduced in width, the hard shoulder temporarily taken out of service, and a temporary 50mph speed limit applied.

Closures & diversion routes

- 11.2.6. Overnight motorway closures are likely to be required for the installation of overbridge beams and some construction at the new M5 junction. In this event the existing signed diversion route between junction 25 and junction 26 (via Taunton town centre and the A38) could be used subject to consultation with Somerset County Council (SCC).
- 11.2.7. Although temporary traffic management measures would be needed at times on the A358 and A303, the aim would be to keep both roads open at all times.

Cost effectiveness

- 11.2.8. The approach to ensuring cost effective construction and maintenance will centre on maximising standardisation of components such as structures, drainage and road restraint systems, and enabling the use of familiar and conventional construction and maintenance techniques. This approach should also help increase the health and safety performance of the scheme during construction and operation.
- 11.2.9. This process is at an early stage, but ultimately liaison will be undertaken with Highways England's construction and maintenance supply chain partners to ensure opportunities to improve cost effectiveness are identified and implemented.
- 11.2.10. One particular area of focus will be on the treatment of the existing A358 carriageway along sections of online widening. Options in these locations range between retaining the existing carriageway as a local road and constructing an entirely new dual carriageway alongside to integrating the existing carriageway as 1 side of the new dual carriageway. The latter approach clearly offers significant efficiencies subject to resolution of complications such as traffic management during construction and the risk of the existing asset being in a poor condition.

Option comparison

- 11.2.11. At this early stage in the scheme's development, there is little to discriminate between the options in terms of buildability considerations relating to safety.

12. Environmental appraisal

12.1. Introduction

- 12.1.1. This section presents a summary of the appraisal of potential environmental effects at both the construction and operation stages of the A358 Taunton to Southfields scheme. The environmental appraisal has been completed in accordance with WebTAG Unit A3 Environmental Impact Appraisal (Department for Transport, December 2015).
- 12.1.2. Environmental assessment has also been completed to a Scoping Level in accordance with Volume 11, Section 3, parts 1-2 and parts 4-11 of the Design Manual for Roads and Bridges (Highways England, dates of issue as appropriate to each part).
- 12.1.3. At this early stage in the scheme's development, the appraisals are being made on a precautionary like-for-like basis across the scheme options without taking into consideration mitigation measures that will accompany the development of the preferred route to avoid or reduce scheme impacts. Once mitigation has been developed and fully integrated into scheme designs, this would reduce some of the adverse effects that have been identified at this stage in the consideration of options. Measures may include screening planting, landscape and acoustic bunds and fences and planting of new habitats for biodiversity value.

12.2. Consultation with statutory bodies

- 12.2.1. Consultations with Statutory Environmental Bodies (SEB) have been undertaken with members of Historic England, Natural England and the Environmental Agency. Workshops have also been held to introduce the scheme to representatives from Somerset County Council, Taunton Deane Borough Council, South Somerset District Council, National Trust and South West Heritage Trust.

12.3. Noise

- 12.3.1. The numbers of properties predicted to experience noise increases or decreases, along with changes in Noise Net Present Value (NPV) for each of the proposed options are presented in Table 12.1. Positive values indicate overall benefits and negative values are considered to be dis-benefits.

Table 12.1: Predicted Noise Benefits (£'s) – all DS options

	Pink option	Blue option	Orange option
Households experiencing increased daytime noise in forecast year (2038)	342	251	397
Households experiencing reduced daytime noise in forecast year (2038)	252	496	74
Households experiencing increased night time noise in forecast year (2038)	229	79	187
Households experiencing reduced night time noise in forecast year (2038)	204	385	93
Noise Benefits (NPV)	£493,647	£2,204,368	-£837,041

Notes: All monetary values are expressed in 2010 prices discounted to 2010

- 12.3.2. The Blue option produces the greatest noise benefit because it would take a substantial proportion of traffic away from properties adjacent and in close proximity to the existing A358 between West Hatch Lane and junction 25. The Pink option would take more traffic off the existing A358 north of the A378, but the new route would run closer to a higher number of properties than the Blue option, particularly where the new road bypasses Henlade, resulting in slightly lower overall noise benefits than the Blue option. The Orange option would remove lower levels of traffic from the A358 through Henlade as no link road would be provided directly to junction 25 unlike the other options, and the new junction at Killams Avenue is located close to a greater number of properties than for the south facing slip roads with the M5 for the other options. Therefore, overall disbenefits are predicted for the Orange option.

12.4. Air quality

- 12.4.1. The change in regional emissions, number of properties experiencing changes in air quality and Net Present Value (NPV) for each of the proposed options is presented in Table 12.2 below.

Table 12.2: Predicted Air Quality Benefits (£'s) – all DS options

	Pink option	Blue option	Orange option
Number of properties where local air quality would improve (2023)	NO ₂ : 10468 PM ₁₀ : 4831	NO ₂ : 9656 PM ₁₀ : 4738	NO ₂ : 5652 PM ₁₀ : 2965
Number of properties where there would be no effect on local air quality (2023)	NO ₂ : 212 PM ₁₀ : 6633	NO ₂ : 192 PM ₁₀ : 6585	NO ₂ : 1359 PM ₁₀ : 4495
Number of properties where local air quality would deteriorate (2023)	NO ₂ : 5850 PM ₁₀ : 5066	NO ₂ : 5316 PM ₁₀ : 3841	NO ₂ : 3166 PM ₁₀ : 2717
Change in Regional Emissions	NO _x (2023): 28.6 t/year PM ₁₀ (2023): 1.9 t/year	NO _x (2023): 26.1 t/year PM ₁₀ (2023): 1.5 t/year	NO _x (2023): 20.9 t/year PM ₁₀ (2023): 1.1 t/year
Air Quality Benefits (NPV)	£-135,996	£179,513	£70,803

Notes: All monetary values are expressed in 2010 prices discounted to 2010

- 12.4.2. The local WebTAG quantitative assessment for Air Quality has concluded that for all options there would be an overall improvement in local ambient air quality within the study area with respect to Particulate Matter (PM₁₀). The regional assessment predicts an increase in regional emissions of oxides of nitrogen (NO_x) and therefore a worsening in regional air quality for all options. None of the scheme options are expected to result in exceedances of the NO₂ or PM₁₀ air quality objectives or limit values.
- 12.4.3. The Pink option is the only option with a negative NPV, due to the regional dis-benefit associated with the increase in regional NO_x emissions outweighing the local PM₁₀ air quality benefits. This is because the Pink option is predicted to trigger the DMRB criteria (namely the Annual Average Daily Traffic (AADT) change of more than 1,000 vehicles) on a greater number of roads than the other options. Therefore, the Pink option has a larger Affected Road Network (ARN) and affects a greater number of properties than the other options. The ARN for this option also includes additional roads with a higher number of properties (for example, in North Curry) where there is also an increase in vehicle numbers and therefore a worsening in local air quality; the Pink option is predicted to have the largest number of properties experiencing a deterioration in local air quality. Therefore, the Pink option has a low local air quality benefit (relative to the other options) which is outweighed by the regional dis-benefit, resulting in an overall air quality dis-benefit being predicted for this option.

12.4.4. Across all 3 scheme options, the air quality ARNs cover the M5, A303, A30 and A358 between Taunton, Southfields Roundabout and Exeter as well as minor B roads near the scheme, such as the B3170 and B3187. Under the Pink and Blue options, the ARN extends into Taunton. The largest ARN is associated with the Pink option, which in addition to covering the roads mentioned above, also includes the main roads through North Curry and Mare Green. This is because a junction would be provided at Mattock's Tree Green for the Pink option, which would cause AADT changes greater than 1000 along the A378.

12.5. Greenhouse gases

12.5.1. The Greenhouse Gas appraisal has indicated that the 3 options are predicted to increase greenhouse gas emissions. The net present value of the change in CO₂e emissions over the 60-year appraisal period from the scheme for each of the options is presented in Table 12.3 below, with detrimental impacts expected for all options. These detrimental impacts are predicted to be minimal in the context of overall UK CO₂ emissions over the next 60 years.

Table 12.3: Predicted Greenhouse Gas Benefits (£'s) – all DS options

	Pink option	Blue option	Orange option
Change in non-traded carbon over 60 years (CO ₂ e)	415,857 tonnes	365,117 tonnes	477,542 tonnes
Change in traded carbon over 60 years (CO ₂ e)	393 tonnes	344 tonnes	808 tonnes
Greenhouse gas benefits	-£18,969,025	-£16,589,054	-£21,790,787

Notes: All monetary values are expressed in 2010 prices discounted to 2010

12.6. Landscape

12.6.1. All 3 proposed route options would traverse the agricultural landscape between Taunton in the west and Ilminster in the east. Existing far reaching views would be disrupted by the presence of the new route which would be visible from this elevated ground.

12.6.2. The visibility of the Blue and the Orange options amongst the local landscape may be limited by intervening vegetation since they would be situated within the lowland plain. However, both these options would be visible from the upper slopes of the adjacent Blackdown Hills AONB, and would be set within the context of panoramic views and the town of Taunton just west of the new alignment. Also, the provision of junctions at West Hatch and Ashill, as well as the new link connecting to junction 25 would increase the level of visual disturbance for these options.

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- 12.6.3. Overall, a Large Adverse effect is anticipated as a result of the Blue option and the Orange option. However, the Pink option would be in the most part either passing in close proximity to or online with the existing A358. This would reduce adverse effects upon landscape character and visual receptors since the route would be contained within the existing road corridor.
- 12.6.4. Nonetheless, the Pink option would be visible from local visual receptors such as residential properties and Public Rights of Way (PRoWs). Large junctions at Mattock's Tree Green and Ashill would be particularly notable given their scale and extension away from the online section. Therefore, an overall Moderate Adverse significance of effect would be anticipated as a result of the Pink option.

12.7. Historic environment

- 12.7.1. All options present the potential for Large Adverse effects on unknown archaeological buried remains. The off-line alignment sections of the Blue and the Orange options would pass through current rural areas with known archaeological assets, and areas of high archaeological potential. More of the Pink option would align with the existing A358 corridor, with only the most northern extent being an off-line route. However, the online section would still require significant land take for widening and junctions and, as such, there would still be the potential for significant effects upon buried archaeology within the 250 metres study area.
- 12.7.2. It is predicted that the construction of all options would have a Slight Adverse effect on the medium value Grade II Listed Buildings located within 250 metres. The same effect is also identified for all options on the Grade II* Listed Buildings. It is not considered that there would be any potential impacts to the form, survival, condition, complexity or period of the assets, although impacts on the setting and character of context of the Grade II and Grade II* Listed Buildings as a result of construction activities is anticipated. However, it these impacts remain of minor magnitude, as all buildings are already within the vicinity of roads.
- 12.7.3. There is some potential for the scheme to have impacts on buried archaeology and on heritage assets such as listed buildings. The risks have been minimised by the choice of route alignments and there is nothing to discriminate significantly between the options at this stage.

12.8. Biodiversity

- 12.8.1. With regards to the effects on designated sites, the Orange option is anticipated to have a Moderated Adverse effect on South Taunton Streams Local Nature Reserve (LNR). These impacts may include, but are not limited to habitat removal and fragmentation, disturbance, air pollution, noise and vibration which would adversely reduce the integrity of this site's environmental resources for which are protected.
- 12.8.2. All the proposed options have the potential to disturb and remove habitats within Local Wildlife Sites (LWS) and ancient woodland, and affect the connectivity between other designated sites within the scheme study area.
- 12.8.3. The proposed works for all options would potentially result in permanent loss of habitats of high to medium conservation value. All options are anticipated to have Moderate Adverse effect upon ancient woodland, hedgerows, standing water, and watercourses. These habitats are all listed within the Somerset LBAP and Taunton Deane LBAP, whilst hedgerows are further protected against the Hedgerow Regulations 1997.
- 12.8.4. In the absence of mitigation, a Moderate Adverse effect would be anticipated to UK protected species including badgers, nesting birds, water voles, otters, white-clawed crayfish and reptiles, and a Large Adverse effect would be predicted to European Protected Species which includes, but is not limited to Great Crested Newts, bats, dormice and schedule 1 listed birds, for all the proposed options.
- 12.8.5. As such, and without mitigation, there would be an overall Moderate Adverse effect anticipated as a result of the Pink, Blue and the Orange options.

12.9. Water environment

- 12.9.1. The appraisal of impacts upon the water environment has been undertaken with the inclusion of standard best practice mitigation measures such as the inclusion of pollution prevention measures within the Construction Environmental Management Plan (CEMP) and Sustainable Drainage Systems (SuDS) in the drainage design. These measures will be a requirement of any Development Consent awarded for any of the options.
- 12.9.2. Standard mitigation would prevent adverse effects from pollutants or increased surface water run-off particularly in Flood Zone 3 and 2 (Taunton) and downstream waterbodies Isle - Cad Brook to Fivehead River, Isle, North Moor Main Drain and Tone Drains. However, it is considered that discharge of dewatering during construction would cause a Slight Adverse Impact on drains and ditches. Construction works within the western extent of all options would also result in a localised Slight Adverse Impact on Tone and North Somerset Stream groundwater body, although this would not compromise the entire waterbody or affect the overall summary assessment score.

- 12.9.3. Due to the early stage in development of the scheme and current absence of a drainage design, but considering standard mitigation measures, an overall Slight Adverse effect is anticipated for all options and no differentiation between the options. This effect would be expected to improve as the design develops, with the inclusion of more detailed and bespoke mitigation.

13. Social impact appraisal

13.1. Social appraisal

- 13.1.1. This section presents a summary of the appraisal of potential social effects at both the construction and operation stages of the A358 Taunton to Southfields scheme. The social appraisal has been completed in accordance with WebTAG Unit A4.1 Social Impact Appraisal (Department for Transport, November 2014).
- 13.1.2. Social assessment has also been completed to a Scoping Level in accordance with Volume 11, Section 3, parts 1-2 and parts 4-11 of the DMRB (Highways England, dates of issue as appropriate to each part).

Accidents

- 13.1.3. The accident assessment is detailed in Section 11.

Physical activity

- 13.1.4. There are a number of NMU amenities located within the study area for all the proposed options, consisting of cycle routes, footpaths, footways and 2 long distance trails, namely the East Deane Way and Staple Fitzpaine Herepath. One signalised crossing is located within 250 metres of all 3 options.
- 13.1.5. All the proposed options would cross several of these Public Rights of Way (PRoWs). These intercepted PRoWs would be kept open via bridged crossings at various points along the option routes. As a result, all of the proposed options have the potential to result in some changes to journey distances for NMUs.
- 13.1.6. At this early stage in the scheme's development, effects associated with physical activity are anticipated to be Neutral for all of the proposed options.

Security

- 13.1.7. None of the proposed options are predicted to alter the security indicators of: site perimeters, entrance and exits, formal or informal surveillance, lighting and visibility and emergency call. Therefore, a Neutral effect is predicted for the all of the proposed options.

Severance

- 13.1.8. All 3 of the proposed options have the potential to adversely impact upon NMU journeys to and from community facilities, resulting in an adverse severance effect. This is because, pending the development of a detailed NMU strategy, the precautionary approach is to assume that all options could result in longer journey times and journey distances between community facilities.

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- 13.1.9. Mitigation measures to minimise these adverse effects would be developed as the scheme evolves, to include new NMU networks and facilities such as footbridges and underpasses, linking community facilities. These would avoid or reduce severance impacts to journeys and potentially relieve existing severance north and south of the A358. The scheme will also reduce traffic flows on parts of the A358, which would further relieve existing severance.

Journey quality

- 13.1.10. All 3 of the proposed options would result in an improvement to journey quality. This is because, in terms of traveller stress, all 3 options have the potential to reduce traveller stress along the A358 through reduced driver frustration in particular. This would be achieved through improved journey times and reliability, with an increased network capacity and provision of new local access roads and strategically placed junctions.
- 13.1.11. Traveller care is not predicted to alter with the 3 options, with no changes to cleanliness, facilities, information and environment.
- 13.1.12. Current design principles would comprise the stopping up of uncontrolled crossing points used by NMUs across the A358, which would improve safety and associated worry of potential accidents for drivers, resulting in a beneficial impact for vehicle travellers. Furthermore, it is expected that NMU crossings would be diverted via bridges to ensure that pedestrians do not encroach on the A358, further reducing driver stress.

Accessibility

- 13.1.13. None of the proposed options are predicted to alter access to existing services, including those services at Southfields Roundabout. Therefore, the overall effects are anticipated to be Neutral.

Personal Affordability

- 13.1.14. Changes to vehicle operating costs and corresponding changes to affordability are not anticipated. Therefore, a Neutral effect is anticipated as a result of the 3 proposed options.

14. Engagement with stakeholders

14.1. Identifying and engaging with stakeholders

- 14.1.1. Identifying and engaging with stakeholders has been an integral element of the options generation and development process.
- 14.1.2. The approach taken during the option identification stage of the appraisal process has been to ensure that all 3 main components of the engagement – consultation, participation and information – are planned and undertaken on an on-going basis with key stakeholders.
- 14.1.3. A stakeholder mapping exercise was undertaken during July and August 2015. Identified stakeholders were categorised according to the role and the level of involvement they would have throughout the project lifecycle.
- 14.1.4. Following this process, the first of a series of workshops with statutory stakeholders took place in December 2015. This and subsequent workshop were attended by representatives from:
- Local authorities: Somerset County Council, South Somerset District Council, Taunton Deane Borough Council
 - Statutory environmental bodies: Environment Agency, Natural England, and Historic England
 - The National Trust and the South West Heritage Trust, both non-statutory consultees, were also invited due to having key interests in this area.
- 14.1.5. The purpose of the workshops was to inform stakeholders of the scheme's progress, seek views to align the scheme with local plans and receive input into the on-going stakeholder engagement programme and scheme development.
- 14.1.6. In addition to the stakeholder workshops, a group was formed to assist with the development of a non-statutory proxy Statement of Community Consultation (SoCC) to assist with the planning of the non-statutory consultation stage. The SoCC development group comprised local authority communications, planning and community engagement officers from Somerset CC, South Somerset DC and Taunton Deane BC. Many of the group's suggestions were incorporated into a draft SoCC, which included recommendations about identifying and engaging with different sectors of the community, including hard-to-reach groups. The group has subsequently advised on the planning of the further non-statutory consultation which will inform decision-making on the choice of preferred route for the scheme.
- 14.1.7. A period of key stakeholder engagement commenced during the summer of 2016 with a series of meetings with statutory and non-statutory stakeholders. The information and views captured during the meetings was considered during the planning of the public consultation processes.

14.1.8. Early consultation was held with local parishes along the route. Parish Council Area Group (PCAG) Meetings were held in November 2016 with all of the parish councils within the vicinity of the proposed scheme extents and provided a forum for local parish councils to air their views about potential route options.

14.2. Information provision – stakeholder workshops

14.2.1. The main role of the stakeholder workshops was to ensure stakeholders' views were captured and considered during the options development process and to introduce, explain and discuss the inclusive engagement processes that would be involved with pursuing a Development Consent Order (DCO) application.

14.2.2. A number of workshops were carried out during the options development stage to ensure that comments and views from the host local authorities, statutory and non-statutory stakeholders were collected and input to the options development process.

14.2.3. Details of the workshops held, attendees and the topics discussed are summarised in Table 14.1.

Table 14.1: Stakeholder workshops

Meeting agenda	Date	Stakeholders attending
Introduction to the A358 project and Highways England/Mott MacDonald Sweco Joint Venture (MMSJV) team	4 December 2015	Somerset County Council, South Somerset District Council, Taunton Deane Borough Council, National Trust, Environment Agency and Natural England
Scheme progress and DCO process	22 March 2016	Somerset County Council, South Somerset District Council, Taunton Deane Borough Council, National Trust, Environment Agency, South West Heritage Trust and Natural England
Scheme progress and options development	13 July 2016	Somerset County Council, South Somerset District Council, Taunton Deane Borough Council, National Trust, Environment Agency, South West Heritage Trust and Natural England
Scheme progress, parish council engagement and the public consultation	11 November 2016	Somerset County Council, South Somerset District Council, Taunton Deane Borough Council, National Trust, Environment Agency, South West Heritage Trust and Natural England
Update on second non-statutory consultation	04 October 2017	Somerset County Council, South Somerset District Council, Taunton Deane Borough Council, National Trust, Environment Agency, South West Heritage Trust and Natural England

14.3. Local authority communications and community engagement meeting

- 14.3.1. A meeting was held with the local authority communications and community engagement officers to introduce and explain the scheme and to discuss the communications strategy.
- 14.3.2. In addition to this, the discussion involved the role that the local authorities' communications and community engagement teams would have assisting with the preparation of a proxy SoCC.
- 14.3.3. This group met once, before transforming into the SoCC development group, with the addition of local authority planning officers. A summary of the topics discussed during the meeting is detailed in Table 14.2.

Table 14.2: Community engagement meetings

Meeting agenda	Date	Stakeholders attending
Introduction to Highways England/MMSJV communications team and outline of communications strategy	14 January 2016	Somerset County Council, South Somerset District Council, Taunton Deane Borough Council

14.4. SoCC development group meetings

- 14.4.1. The SoCC development group comprises representatives from the local authorities' communications, community engagement and planning officers. The purpose of the group is to advise on a SoCC that takes into consideration all sections of the local community and the methods used to communicate with them.
- 14.4.2. Much of the feedback gained during the group's first meeting was included in a non-statutory SoCC, which will be used as a guide to producing the statutory SoCC once the scheme reaches the statutory pre-application consultation stage under the DCO planning regime.
- 14.4.3. Feedback from the meetings included suggestions for public exhibition venues and public viewing areas during the non-statutory consultation period, discussion of consultation zones and consultation channels, and consideration of hard-to-reach community groups.
- 14.4.4. Feedback was collated and included in a proposed final SoCC, which was circulated with explanatory guidance to host and adjoining local authorities for a more formal 30-day review and comment period.
- 14.4.5. Details of the meetings held, the topics discussed and the location are summarised in Table 14.3.

Table 14.3: SoCC development group meetings

Meeting agenda	Date	Stakeholders attending
Non-statutory SoCC development and community engagement	22 March 2016	Somerset County Council, South Somerset District Council and Taunton Deane Borough Council
Non-statutory SoCC review	26 May 2016	Somerset County Council, South Somerset District Council and Taunton Deane Borough Council

14.5. Communications working group

- 14.5.1. Only one meeting of the communications working group has been held to date, as summarised in Table 14.4.

Table 14.4: Communications working group meetings

Meeting agenda	Date	Stakeholders attending
Communications working group	04 October 2017	Somerset County Council and Taunton Deane Borough Council

14.6. 2017 Public Consultation

- 14.6.1. The scheme held its non-statutory public consultation, presenting the Orange option as the proposed route option, between 28 March and 16 July 2017. A strong feedback theme was a wish to see more than one option which connected with the M5, providing increased traffic relief for Henlade, and for connecting more directly with the future 'Nexus 25' development (planned in the south-east quadrant of the existing M5 junction 25).
- 14.6.2. Having carefully considered the feedback received, it was concluded that it would be beneficial to reconsult on the scheme proposals before selecting a preferred route.
- 14.6.3. The 2017 consultation feedback has been reported in the *A358 Taunton to Southfields Public Consultation Report*, which can be found through the scheme website at <http://www.highways.gov.uk/Taunton-to-Southfields>.

14.7. Further engagement

- 14.7.1. Further meetings were held with stakeholders in October 2017 to introduce, explain and discuss the further non-statutory consultation. Details of these meetings are included in Table 14.5.

Table 14.5: Meetings relating to further non-statutory consultation

Meeting agenda	Date	Stakeholders attending
Further non-statutory consultation	4 October 2017	Somerset County Council, South Somerset District Council, Taunton Deane Borough Council, Blackdown Hills AONB, the National Trust, the South West Heritage Trust and the Heart of the South West LEP
Further non-statutory consultation – communications and community engagement	4 October 2017	Somerset County Council, and Taunton Deane Borough Council

15. Appraisal summary

15.1. Appraisal Summary Tables (ASTs)

15.1.1. Appraisal Summary Tables with corresponding worksheets have been produced in accordance with the Department for Transport's Transport Analysis Guidance (WebTAG). The summary tables are reproduced in Appendix D of this report.

15.2. Comparison of options

Economics

- 15.2.1. In the economic assessment summarised in Section 10 of this report, the Pink option has the highest present value benefits (£527.851 million) and the Orange option has the lowest (£351.158 million), whilst the present value costs are highest for the Pink option (£261.073 million) and lowest for the Orange option (£243.851 million).
- 15.2.2. The Pink option has the highest benefit to cost ratio (BCR) of 2.08 when adjusted to include reliability benefits, whilst the Orange option has the lowest at 1.64. The Blue option has a BCR value of 1.87.
- 15.2.3. Under the Department for Transport's value for money criteria, these represent medium or high value for money (medium value for money is in the range 1.5-2.0 and high value for money in the range of 2.0-4.0). However, it should also be noted that the assessment of wider economic benefits undertaken with TEAM (Mott MacDonald's Transparent Economic Assessment Model) shows that these benefits are likely to be significant providing further justification of the scheme.
- 15.2.4. Overall, in terms of value for money, the best option is the Pink option followed by the Blue and the Orange options.

Safety – accident savings

15.2.5. The COBALT (Cost and Benefit of Accidents – Light Touch) results used in the economic assessment give the cost of accidents in monetary form for the 60-year appraisal period. Overall, the Pink option demonstrates the highest economic benefit of accident savings, followed by the Blue and Orange options.

Buildability and maintenance

15.2.6. In the qualitative assessment presented in Section 11.2 of this report, none of the options would be more or less favourable in terms of buildability than any other. All 3 options would be similar in terms of maintenance.

Environment

Noise

15.2.7. The Pink and Blue options are predicted to result in an overall improvement in noise at local residential areas, whilst the Orange option is predicted to result in an overall disbenefit in noise in residential areas. The Blue option would have the highest positive benefit of £2,204,368 primarily due to traffic decreases at residential areas on the A358 through Henlade. The Pink option would have a positive benefit of £493,647, also with traffic reductions along the existing A358 through Henlade, but the route for this option would pass closer to more houses than the Blue option. The Orange option would have a dis-benefit of -£837,041 with the route removing the least amount of traffic from the existing A358 through Henlade and the new junction with the M5 located closer to more homes than the south facing slip roads for the other options.

Air Quality

15.2.8. All Options are predicted to result in an overall improvement in local air quality. This is due to the redistribution of vehicles on the road network. At a regional level, all options are predicted to increase emissions of oxides of nitrogen (NO_x), but it is only for the Pink option that these regional dis-benefits would outweigh the benefits from local improvements, resulting in an overall disbenefit for this option. This is due to the larger ARN for this option and the greater number of properties experiencing a worsening of air quality compared to the other options. Overall, the Blue option would have the greatest benefit in net present value benefit of £179,513, whilst the Orange option would have a net present value benefit of £70,803. The Pink option would have a net present value dis-benefit of -£135,996.

15.2.9. None of the scheme options are expected to result in any exceedances of the NO₂ or PM₁₀ air quality objectives or limit values.

Greenhouse Gases

15.2.10. The greenhouse gas appraisal indicates that all the options would lead to an increase in greenhouse gas emissions. The Blue option is predicted to have the smallest dis-benefit at -£16,589,054; the Pink option would have a dis-benefit of -£18,969,025; the Orange option would have the greatest dis-benefit of -£21,7910,787. The range of dis-benefits that have been predicted for the scheme options would primarily be due to a change in vehicle-kilometres relative to the Do Minimum scenarios in the opening year and design years. These detrimental impacts are predicted to be minimal in the context of overall UK CO₂ emissions over the next 60 years.

15.2.11. Other environmental issues have been subject to a qualitative appraisal.

Landscape & heritage

15.2.12. The Blue and the Orange options have been assessed as having a Large Adverse effect on landscape before mitigation. The Pink option has been appraised as having a Moderate effect on landscape before mitigation, since this option sits closer to the existing road corridor. In relation to heritage and historic resources, all options present the potential for Large Adverse effects on unknown archaeological buried remains. Additionally, all options, would have a Slight Adverse effect on medium value Grade II listed buildings located within 250 metres.

Biodiversity & water environment

15.2.13. In the area of biodiversity, all options are anticipated to have a Moderate Adverse impact on designated sites. All 3 options have been given a score of Slight Adverse at this stage in relation to the water environment.

Journey quality & physical activity

15.2.14. All 3 options are anticipated to have Neutral effects associated with physical activity and an improvement to journey quality.

16. Programme

16.1.1. The timeline for this scheme is currently being reviewed to understand the impact that taking the decision to reconsult will have. The intention is to build the scheme as close to the original start date as possible which would include some preparatory works in 2020 and main construction following soon afterwards assuming the scheme has successfully received planning permission.

16.1.2. Key programme dates, at the time of writing, are:

- Commence public consultation March 2017
- Commence reconsultation January 2018
- Preferred Route Announcement Autumn 2018
- Application for Development Consent Order Autumn 2019
- Publish Development Consent Order Spring 2021
- Secretary of State decision Spring 2021
- End of legal challenge period Summer 2021
- Start of construction Summer 2021
- Scheme open to traffic Summer 2024

17. Conclusions and recommendations

17.1. Options for public consultation

Conclusions

- 17.1.1. In economic terms, all options would provide medium-to-high value for money, with the Pink option having the highest benefit-cost ratio and the Orange option having the lowest.
- 17.1.2. In qualitative assessments of safety, buildability and maintenance, all 3 options are considered similar.
- 17.1.3. In environmental quantitative assessments of noise and air quality impacts, the Blue option tends to perform best on both aspects, with Orange performing better than Pink on air quality and vice versa on noise.
- 17.1.4. In environmental qualitative assessments, the options perform similarly in the categories assessed except in the areas of landscape and biodiversity, where the Pink option would have a lesser impact than the other options.

Recommendations

- 17.1.5. It is recommended that the following options be taken to public consultation:
- Pink option
 - Blue option
 - Orange option

Appendices

Appendix A Glossary

- AADT Analysis of Annual Average Daily Traffic
- AIL Abnormal and indivisible load
- AOD Above ordnance datum
- AONB Area of Outstanding Natural Beauty
- AQMA Air Quality Management Area
- AQO Air Quality Objective
- AQS Air Quality Standard
- ARCADY Assessment of Roundabout Capacity And Delay
- ARN Affected Road Network
- AST Appraisal Summary Table
- ATC Automatic Traffic Count
- BAP Biodiversity Action Plan
- BCR Benefit Cost Ratio
- BGS British Geological Survey
- BMV Best and most versatile
- BT British Telecom
- CDM Construction and Design Management
- CEMP Construction Environmental Management Plan
- COBA Cost Benefit Analysis
- COBALT Cost and Benefits of Accidents – Light Touch
- COSHH Control of Substances Hazardous to Health
- D2AP Dual 2 lane all-purpose road
- dB Decibel
- DCC Devon County Council
- DCO Development Consent Order
- Defra Department for Environment, Food and Rural Affairs
- DfT Department for Transport
- DMRB Design Manual for Roads and Bridges
- DS Do-Something
- EC European Community
- EEC European Economic Community
- EIA Environmental Impact Assessment
- EPA Environmental Protection Act
- EU European Union
- FMA Fully Modelled Area
- FRA Flood Risk Assessment
- GCN Great Crested Newts
- GIS Geographical Information System
- GVA Gross Value Added

• HADDMS	Highways Agency Drainage Data Management System
• HATRIS	Highways Agency Traffic Information System
• HDV	Heavy duty vehicle
• HELAA	Housing and Economic Land Availability Assessment
• HGV	Heavy goods vehicle
• KPI	Key Performance Indicator
• KSI	Killed or seriously injured
• LBAP	Local Biodiversity Action Plan
• LEP	Local Environmental Plan
• LinSig	Linear Signals Analysis
• LNR	Local Nature Reserves
• LWS	Local Wildlife Site
• MCC	Manual Classified Count
• MCTC	Manual Classified Turning Counts
• MMSJV	Mott MacDonald Sweco Joint Venture
• MOD	Ministry of Defence
• MSOA	Medium-level Super Output Area
• NCA	National Character Area
• NFS	North Facing Slip roads
• NHP	National High Pressure
• NIA	Noise Important Area
• NMU	Non-motorised user(s)
• NNR	National Nature Reserve
• NPPF	National Planning Policy Framework
• NPPG	National Planning Practice Guidance
• NPS	National Policy Statement
• NPSNN	National Policy Statement for National Networks
• NPV	Net Present Value
• NSIP	Nationally Significant Infrastructure Project
• NTEM	National Trip End Model
• OA	Output Area
• OD	Operations Directorate
• O-D	Origin-Destination
• PCAG	Parish Council Area Group
• PCF	Project Control Framework
• PCU	Passenger car unit
• PIA	Personal Injury Accident
• PRoW	Public Rights-of-way
• PVB	Present Value of Benefits
• PVC	Present Value of Costs
• QUADRO	Queues and Delays at ROadworks
• RAF	Royal Air Force

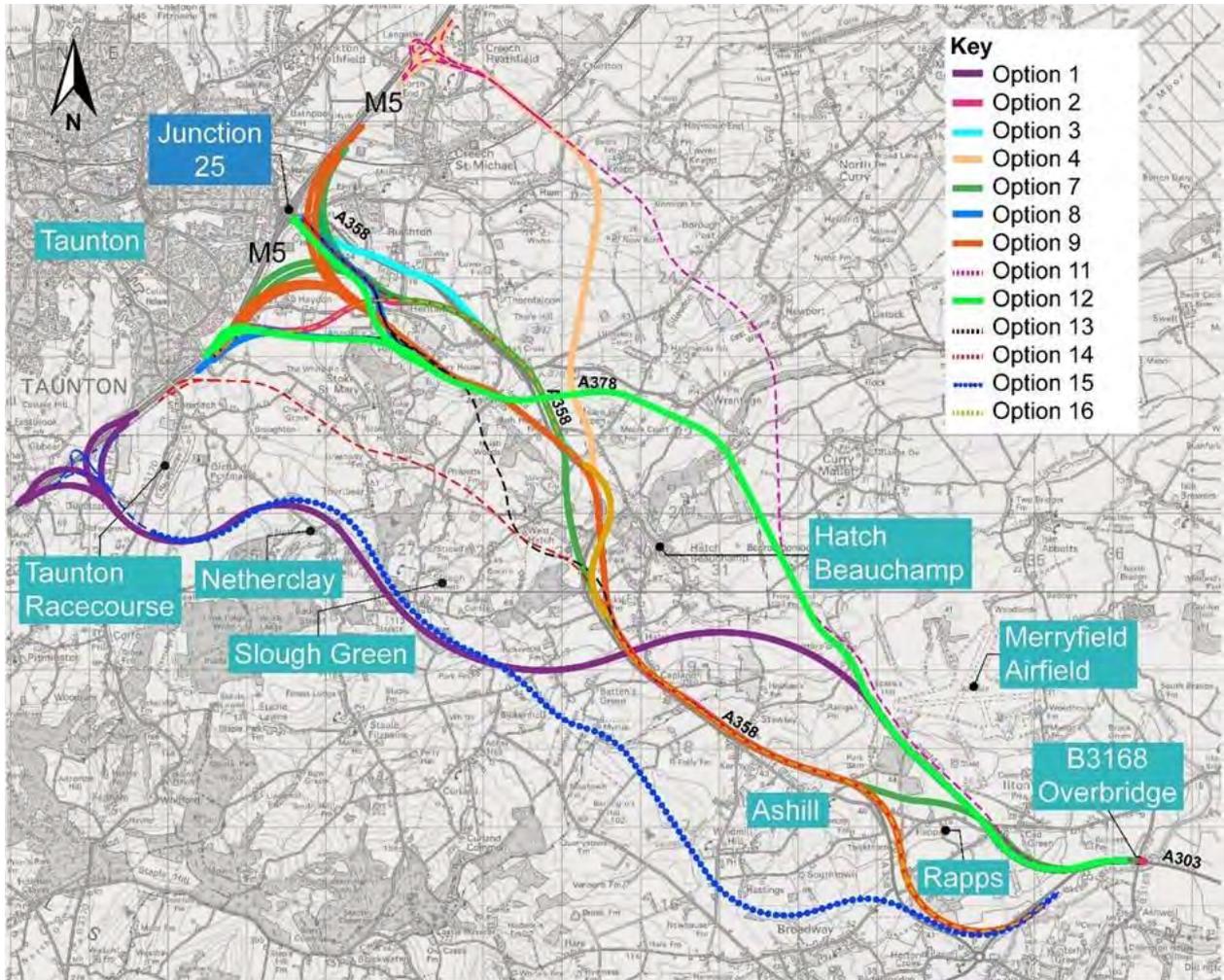
• RIS	Road Investment Strategy
• RIU	Regional Intelligence Unit
• RNAS	Royal Naval Air Service
• RoWSaF	Road Worker Safety Forum
• RSI	Roadside Interview Data
• RSPB	Royal Society for the Protection of Birds
• SAC	Special Area of Conservation
• SADMP	Site Allocations and Development Management Plan
• SATURN	Simulation and Assignment of Traffic to Urban Road Networks
• SCC	Somerset County Council
• SEB	Statutory Environmental Bodies
• SHLAA	Strategic Housing Land Availability Assessment
• SOBC	Strategic Outline Business Case
• SoCC	Statement of Community Consultation
• SPA	Special Protection Area
• SPOSH	Significant Possibility of Significant Harm
• SPOSPCOW	Significant Possibility of Significant Pollution to Controlled Waters
• SRN	Strategic Roads Network
• SSDC	South Somerset District Council
• SSE	Scottish and Southern Electricity
• SSSI	Site of Special Scientific Interest
• SuDS	Sustainable drainage systems
• SURVIVE	Safe Use of Roadside Verges in Vehicular Emergencies
• SWARMMS	South West Area Multi Modal Study
• SWP	South West peninsula
• SWRTM	South West Regional Traffic Model
• TAG	Transport Analysis Guidance
• TAR	Technical Appraisal Report
• TD	Technical Directive
• TDBC	Taunton Deane Borough Council
• TEAM	Transparent Economic Assessment Model
• TEN-T	Trans Europe Network – Transport
• TUBA	Transport User Benefit Appraisal
• VfM	Value for Money
• VOC	Vehicle operating costs
• WCC	White-clawed crayfish
• WebTAG	Transport Analysis Guidance
• WFD	Water Framework Directive
• WPD	Western Power Distribution
• ZTV	Zone of Theoretical Visibility

Design standards used:

TD 9/93	Highway Link Design	DMRB Chapter 6.1
TD27/05	Cross-Sections and Headrooms	DMRB Chapter 6.1
TD22/06	Layout of Grade Separated Junctions	DMRB Chapter 6.2
TD40/94	Layout of Compact Grade Separated Junctions	DMRB Chapter 6.2

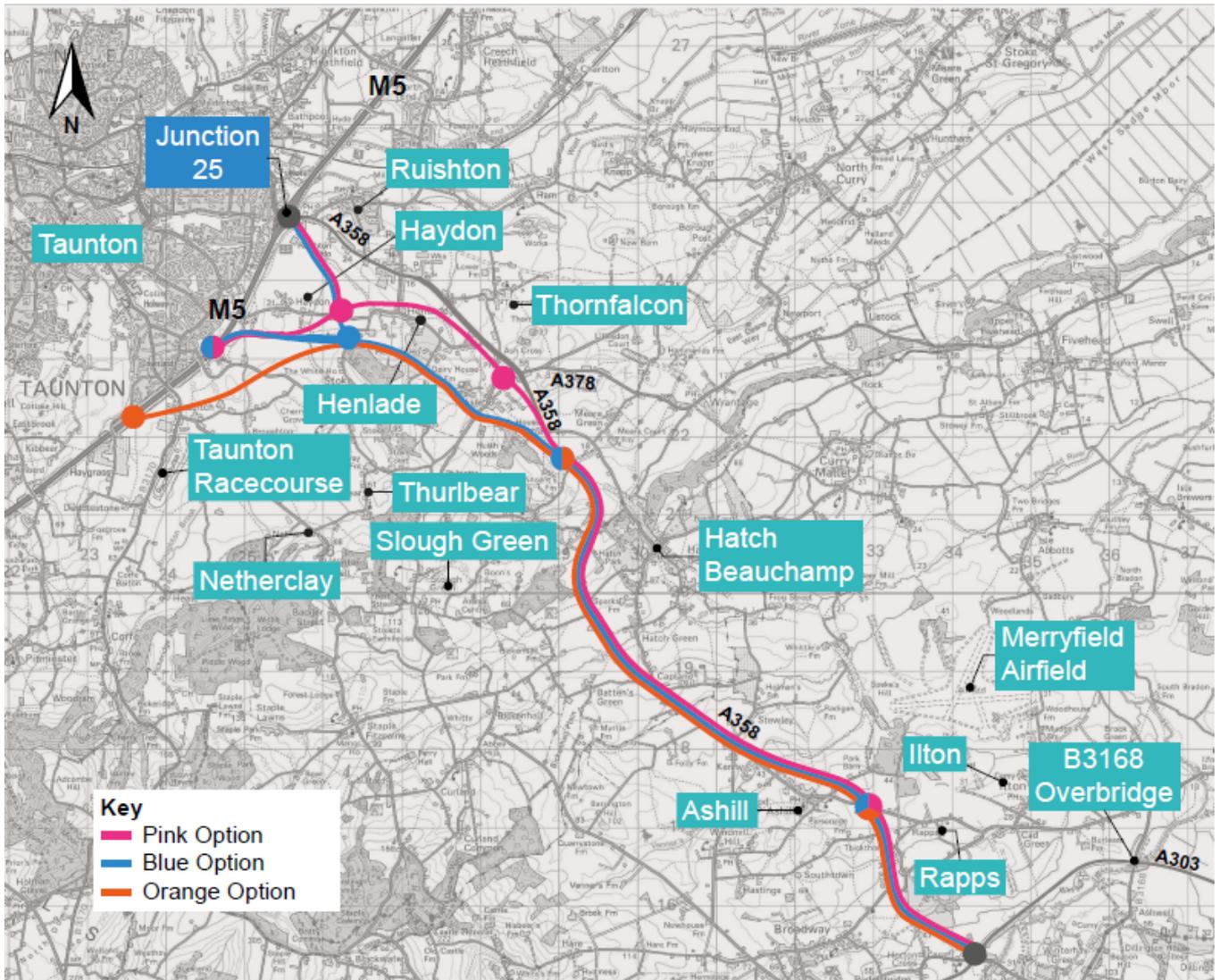
Appendix B Route Options and Environmental Constraints Plan

Appendix B 1 - Initial routes considered



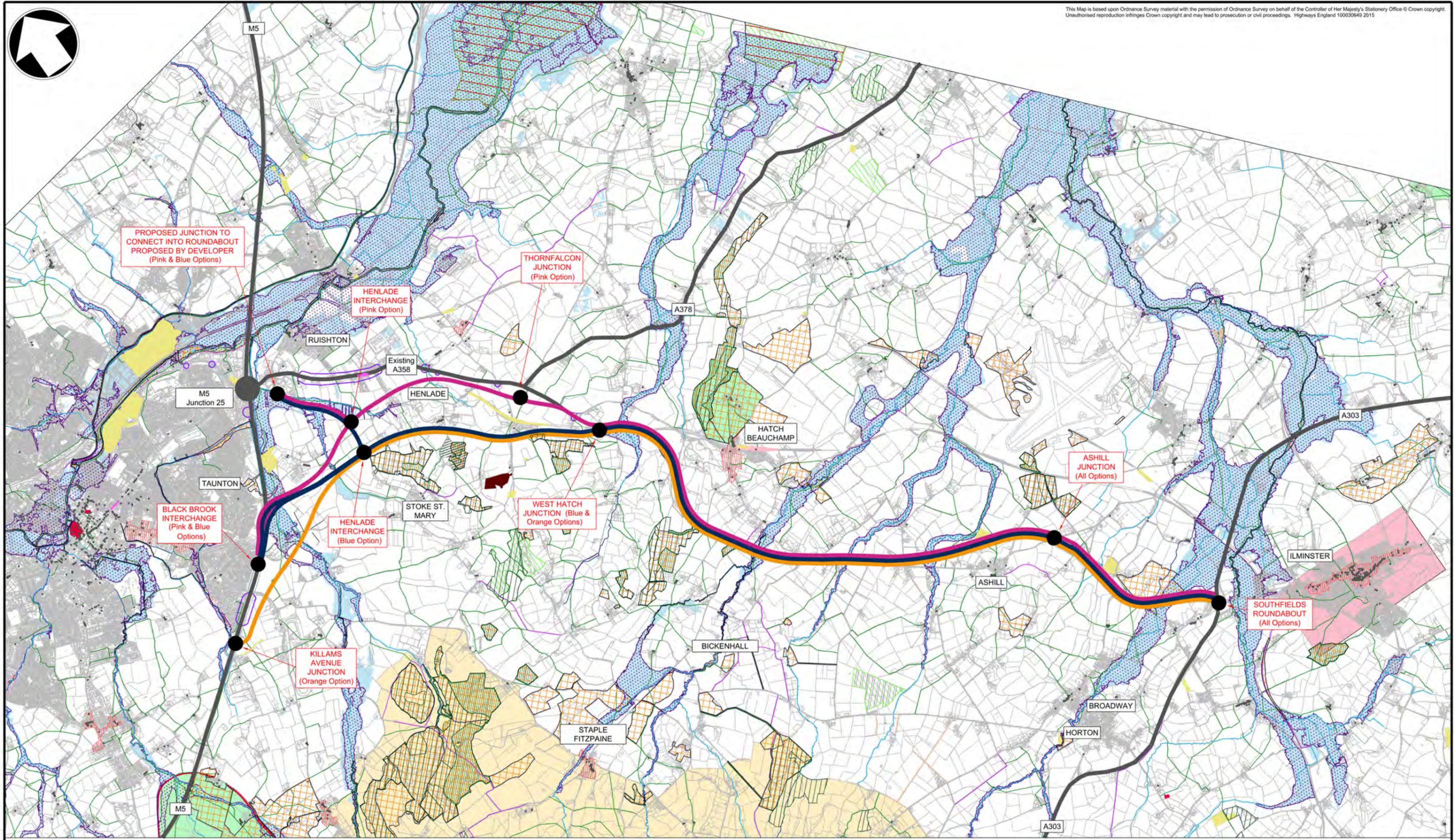
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Appendix B 2 – Shortlisted Options



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Appendix B 3 – Environmental Constraints Plan



Client

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- Key to symbols**
- Cycle path
 - Footpath
 - Bridleway
 - Restricted Byway
 - Proposed Junctions
 - Pink Option
 - Blue Option
 - Orange Option

- Rivers
- Registered Common Land
- Local Wildlife Sites
- Sites of Special Scientific Interest
- Scheduled Monuments
- Authorised Landfill
- Historic Landfill
- Listed Buildings
- Conservation Area

- RAMSAR and Special Protection Area
- Registered Parks and Gardens
- Area of Outstanding Natural Beauty
- Local Nature Reserve
- National Nature Reserve
- Ancient Woodlands
- Woodlands Trust Woods
- Listed Woodlands identified by Somerset Environmental Records Centre

- Air Quality Management Areas
- Noise Important Areas
- Local Geological Site
- Flood Zone 2
- Flood Zone 3

Not To Scale

Project Title
A358 Taunton to Southfields

Drawing Title
Known Environmental Constraints

Appendix C Sift scoring mechanism

Criteria	Purpose	Scoring	Scoring range
Phase 1			
Strategic	Does proposed option meet with pre-identified scheme objectives		
- Identified problems and objectives	Provides an opportunity for an outline of the scheme to be input with an emphasis on identifying any key issues and constraints	Not scored	N/A
- Scale of impact (RIS)	To determine to what extent proposed options have provided solutions to the problems and issues relating to the scheme	Scale of 1-5	1 = Very small positive impact 5 = Fully addresses the identified problem
- Fit with wider government and transport objectives	To assess how government and transport objectives are met for the following criteria as given in the National Policy Statement for National Networks: - Environmental and Social Impacts - Emissions - Safety - Technology - Sustainable Transport - Accessibility	Scale of 1-5 for each category	1 = Poor fit 5 = Excellent fit
- Fit with wider objectives	To determine how well the proposed options are aligned with other objectives. The Client Scheme Requirements (see section 5.2 of this report) were used to represent scheme objectives.	Scale of 1-5	1 = Poor fit 5 = Excellent fit
- Key uncertainties	To input in a text box any key uncertainties that are associated with the proposed options.	Not scored	N/A
- Degree of consensus over outcomes	To assess the level of consensus that has been achieved for each of the proposed schemes.	Scale of 1-5	1 = Little or no consultation yet or high level of disagreement over outcomes 5 = Extensive consultation to date with a high degree of consensus over outcomes
Phase 2			
Economic			
Economic growth	To assess the effects of the proposed options under each of the following criteria: - Connectivity - Reliability - Wider economic impacts - Resilience - Delivery of housing	7-point scale in line with 7 levels of rating in WebTAG Unit A3	+3 = Largely beneficial -3 = Largely adverse
Carbon emissions	To assess the effects of the proposed options under each of the following criteria: - Activity - Embedded carbon - Carbon content - Efficiency - Overall effect on carbon emissions	7-point RAG scale or Yes/No score of -1 or 0	For activity, carbon content and efficiency: +3 = Largely beneficial -3 = Largely adverse For embedded carbon -1 if significant construction work would be required; otherwise 0
Socio-distributional impacts and the regions	To assess the effects of the proposed options under each of the following criteria: - Social and distributional impacts and the regions - Regeneration - Regional imbalance	7-point RAG scale	+3 = Largely beneficial -3 = Largely adverse

Criteria	Purpose	Scoring	Scoring range
Local environment	To determine the impact of the proposed options under each of the following criteria: <ul style="list-style-type: none"> - Air quality - Noise - Natural environment, heritage and landscape - Streetscape and urban environment 	7-point RAG scale or Yes/No score of -1 or 0	+3 = Largely beneficial -3 = Largely adverse For Air Quality, if an AQMA is affected, how many are affected: 2 = Many – Positive impact -2 = Many – Negative impact For Noise, if affecting a Problem Area: 1 = Yes 0 = No For natural and urban environment, if there is a negative impact what is the value of the environment affected: -1 = High 0 = Low
Well-being	To determine the impact of the proposed options under each of the following criteria: <ul style="list-style-type: none"> - Physical activity - Injury or deaths - Severance - Crime - Terrorism - Enabling people to enjoy access to a range of goods, services, people and places 	7-point RAG scale	+3 = Largely beneficial -3 = Largely adverse
Expected value for money (VfM) category	To assess the expected VfM category against the EAST ratings of: <ul style="list-style-type: none"> - Poor (BCR<1) - Low (1<BCR<1.5) - Medium (1.5<BCR<2) - High (2<BCR<4) - Very High (BCR>4) 	Scale of 1-5	1 = Poor BCR 5 = Very high BCR
Managerial			
Implementation tables	To provide an estimate of the timescales for each option from inception to delivery.	Scale of 1-7 in line with 7 levels in EAST	1 = 0-1 months to completion 7 = 10+ years to completion
Public acceptability	To assess any perceived issues with the public.	Scale of 1-5	1 = Low 5 = High
Practical feasibility	To determine whether the proposed options will have outcomes that are both practical and effective.	Scale of 1-5	1 = Low 5 = High
Quality of the supporting evidence	To evaluate the quality of the supporting evidence that has been used to sift the proposed options.	Scale of 1-5	1 = Low level of supporting evidence; scheme has not been investigated elsewhere 5 = High level of supporting evidence; scheme has been modelled in detail or subjected to a business case appraisal
Key risks	To enable the respondent to note in a text field any key risks that have been identified with that option	Not scored	N/A
Financial			
Affordability	To set out whether the scheme is to be considered affordable in terms of the available budget as well as the budget period.	1 or 5	1 = Unaffordable 5 = Affordable

Criteria	Purpose	Scoring	Scoring range
Capital costs	To supply the estimated capital costs of all the potential options.	Scale of 1-10 in line with 10-point scale in EAST	1 = £1000 million+ 10 = No capital cost
Revenue costs	To provide an estimate of the maintenance and other costs that will be required for upkeep.	Scale of 1-10 in line with 10-point scale in EAST	As there is insufficient detail to estimate maintenance costs at this stage, no scores will be applied
Cost profile	To assess whether previous assessments have fully considered all the implementation, operation, maintenance and enforcement costs including administration.	Not scored	N/A
Overall cost risk	To rate the overall cost risk of proposed options	Scale of 1-5	1 = High risk 5 = Low risk
Commercial			
Flexibility of option	To assess what flexibility there is for changing the features of the proposed options based on the level of funding available.	Scale of 1-5	1 = Static 5 = Dynamic
Where is funding from?	This would be used to assess what sources of funding would be available for each option but at this stage it is not envisaged that there will be any other sources of funding than that announced in the Road Investment Strategy.	Not scored	N/A
Any income generated	This would be used to identify if any of the options have the potential to generate any income but at this stage there is no intention for any option to do so.	Not scored	N/A

Appendix D Appraisal Summary Tables

Appraisal Summary Table		Date produced:	Jan-18	Contact:					
Name of scheme:		A358 Taunton to Southfields - Pink Option			Name		David Stock		
Description of scheme:		The Scheme intends to provide a dual carriageway on the A358 between Taunton and Southfields Roundabout in Somerset. The Scheme links the A303 at Ilminster with the M5 at Taunton and is likely to include grade-separated junctions and the removal of at-grade junctions and direct accesses. The Pink Option commences at the M5 approximately 2km south of Junction 25. The route initially passes south of Haydon and north of Stoke Wood, and then along Stoke Road before running parallel to the south of existing A358 for approximately 100-200m. The proposed road then meets up with the route of the existing A358 at West Hatch Lane. The route passes close to the A378 junction at Mattocks Tree Hill which would enable direct travel between the proposed road and the A378. This option involves the re-use of a greater amount of the existing A358 than the other two options. There would be online widening of the existing A358 between Mattocks Tree Hill and Southfields Roundabout.			Organisation		Highways England		
					Role		Promoter/Official		
Impacts		Summary of key impacts		Assessment					
				Quantitative	Qualitative	Monetary £(NPV)	Distributional 7-pt scale/ vulnerable grp		
Economy	Business users & transport providers	Journey Time Benefits by converting a single carriageway section to modern dual carriageway with associated junction improvements. Net journey time changes is the net of positives and negatives in a given time band. Monetary (NPV) includes both journey times and vehicle operating cost impacts.		Value of journey time changes (£)		£308.6m	N/A	Yes	
				Net journey time changes (£)					
				0 to 2min	2 to 5min	> 5min			
				£7.1m	£68.5m	£233m			
	Reliability impact on Business users	Reliability benefits by converting a single carriageway section to modern dual carriageway with associated junction improvements.		N/A		N/A	£30.9m		
	Regeneration	N/A		N/A		N/A	N/A		
	Wider Impacts	Positive impact on jobs and GVA growth has been identified using a bespoke approach aligned to the emerging WebTAG units on Wider Impacts - full description provided in the A358 Taunton to Southfields Land Use and Economic Development Report, July 2016.		Growth of approx. 630 jobs and £37.7 million annual GVA.		N/A	N/A		
Environmental	Noise	The WebTAG noise appraisal for the Pink Option indicates an overall net improvement in noise within the study area. The provision of a link road to Junction 25 would divert traffic from the existing A358 onto the new road. However, the overall noise benefits are reduced as this option would pass through high population density areas. Nonetheless, the positive impact of the diversion is sufficient such that the overall appraisal with respect to noise indicates a net benefit.		Households experiencing increased daytime noise in forecast year: 342. Households experiencing reduced daytime noise in forecast year: 252. Households experiencing increased night time noise in forecast year: 229. Households experiencing reduced night time noise in forecast year: 204		n/a	NPV= £493,647 (Positive value indicates net benefit)	Yes	
	Air Quality	The WebTAG local air quality assessment results show there is a net improvement in local air quality within the study area. The Scheme does not result in an exceedance of the NO2 or PM10 air quality objectives or limit values. The regional assessment predicts an increase in emissions of NOx and PM10 primarily as a result of the rerouting of vehicles on to the M5 away from surrounding A and B roads between Exeter and Taunton, resulting in a longer route for vehicles when approaching via the A303. Reduced vehicle numbers on roads such as the A30 and A373 where there are high numbers of receptors has the effect of improving local air quality in these areas. Overall, the total change in NPV is negative indicating a net deterioration in air quality when considering both local and regional effects.		Local Air quality effects at properties (Improvements / No effect / Deterioration) NO2 2023 (10468/ 212 / 5850) PM10 2023 (4831 / 6633 / 5066) Overall Assessment Score (negative score reflect benefit) NO2: (2023): minus -1023.1 PM10: (2023): minus -195.7 Change in Regional Emissions NOx (2023): 28.6 t/year PM10 (2023): 1.9 t/year		N/A (Guidance states that this column should not be used for AQ)	Value of change in PM concentrations: NPV: £685,170 Value of change in NOx emissions: NPV: minus -£821,166 Total value of change in air quality NPV: minus -£135,996 (Negative value reflects net disbenefit)	Yes	
	Greenhouse gases	Increase in GHG emissions are due to increased fuel consumption, which is related to slightly longer distances travelled by vehicles.		Change in non-traded carbon over 60y (CO2e) 415,857 tonnes Change in traded carbon over 60y (CO2e) 393 tonnes		N/A (Guidance states that this column should not be used for GHG)	-£18,969,025		
	Landscape	This option, would in the most part either run in close proximity to the existing A358 or online. Whilst the scheme would be a short distance from designated assets, including Listed Buildings and Registered Parks and Gardens, there would be no direct impact upon these features. The Pink Option would be visible from local visual receptors such as residential properties and Public Rights of Way. Large junctions at Mattocks Tree Hill and Ashill would be particularly notable given their scale and extension away from the online scheme. Mitigation planting would help to reduce the impacts upon visual amenity and landscape character over time.		N/A		Moderate Adverse	N/A		
	Townscape	N/A		N/A		N/A	N/A		
	Historic Environment	The Pink Option has a scale of impact on the historic environment: Large Adverse on the buried archaeology, Slight Adverse on Grade II Listed Buildings and Slight Adverse on Grade II* Listed Buildings. This results in an overall Large Adverse impact. The primary concern is the removal/destruction of any buried archaeology located within the route option.		N/A		Large Adverse	N/A		
	Biodiversity	There would be an overall Moderate Adverse effect on biodiversity as a result of the Pink Option. The option presents a Moderate Adverse effect to the five Local Wildlife Sites within the footprint of the option and a Slight Adverse effect to the four Special Areas of Conservation designated for bat conservation within 30km of the route. The loss of habitats is considered to represent an Intermediate Negative magnitude of impact with a Moderate Adverse overall assessment score for those habitats listed on the Somerset Biodiversity Action Plan. The proposed works have the potential to affect bats, otters, water voles, kingfisher, dormice, reptiles, badgers, barn owls, white clawed crayfish, great crested newts, fish, invertebrates and nesting birds through the loss, fragmentation and isolation of habitats.		N/A		Moderate Adverse	N/A		
	Water Environment	Careful consideration is required for the multiple new crossings of the Pink Option over the various watercourses, potential alteration of groundwater level and the work in flood zone 3 and 2 (Taunton). The potential incorporation of SuDS and pollution control measures within the drainage design would prevent any adverse effects. A precautionary Slight Adverse score has been assigned without mitigation.		N/A		Slight Adverse	N/A		
Social	Commuting and Other users	Journey Time Benefits by converting a single carriageway section to modern dual carriageway with associated junction improvements. Net journey time changes is the net of positives and negatives in a given time band. Monetary (NPV) includes both journey times and vehicle operating cost impacts.		Value of journey time changes (£)		£316.8m	N/A	£282.8m	Yes
				Net journey time changes (£)					
				0 to 2min	2 to 5min	> 5min			
				£20.8m	£80.2m	£215.7m			
		Reliability impact on Commuting and Other users	Reliability benefits by converting a single carriageway section to modern dual carriageway with associated junction improvements.		N/A		N/A	£31.7m	
		Physical activity	The Pink Option would require the severance of several PRoW. However, it is considered likely that most of the severed routes will be replaced in the form of a crossing footbridge or underpass if deemed necessary following the NMU survey results. Given that the majority of severed NMU routes are likely to be replaced, the Pink Option has the potential to result in changes to journey distances. At this stage, it is unknown whether journey distances will increase or decrease, and as such effects are considered to be Neutral.		N/A		Neutral	N/A	
		Journey quality	The Pink Option is anticipated to improve traveller care through the provision of new signage, gantries and lighting. New views would be provided to the surrounding area for travellers, although mitigation planting and sections of road in cutting would reduce views to the wider area. Traveller stress is predicted to reduce for the Pink Option, with the provision of new safety related infrastructure including new lane markings, a reinforced concrete barrier in the central reserve, cat's eyes and road studs, as well as NMU provisions reducing the likelihood of NMUs encroaching onto the A358.		N/A		Moderate Beneficial	N/A	
		Accidents	Reduction in the number of PIAs and casualties by converting the single carriageway sections to modern dual carriageway standard with associated junction improvements. (Negative values indicate an increase in casualties).		Reduction in casualties: Fatal=-1, Serious=47, Slight=254		N/A	£10m	Yes
		Security	Effects to security as a result of the Pink Option are anticipated to be Neutral as there are not anticipated to be any changes to security indicators as a result of the proposed option.		N/A		Neutral	N/A	No
		Access to services	The Pink Option is unlikely to alter access to services within the area, with side roads and junctions appropriately positioned to minimise impacts. Therefore this option is considered to have a Neutral impact.		N/A		Neutral	N/A	Yes
	Affordability	Changes to vehicle operating costs and therefore changes to affordability as a result of the Pink Option are not anticipated and this option is therefore anticipated to have a Neutral effect on affordability.		N/A		Neutral	N/A	Yes	
	Severance	The Pink Option has the potential to result in severance to pedestrian journeys to and from community facilities within 250m of this option. There is also potential for pedestrian journeys to facilities further than 250m from this option to be affected. In the absence of a detailed NMU strategy at this stage, it is considered that this option is likely to result in longer journey times and journey distances between community facilities. Mitigation measures to minimise these adverse effects would be developed as the scheme evolves, and would be likely to include new NMU networks and facilities such as footbridges and underpasses, linking community facilities and subsequently minimising severance. The Scheme could also result in relief from existing severance with traffic flows potentially reduced on the existing A358.		N/A		Moderate Adverse	N/A	Yes	
	Option and non-use values	The scheme is expected to have little or no impact on option and non-use values		N/A		Neutral	N/A		
Public Accounts	Cost to Broad Transport Budget	The scheme would be funded through Central Government Funds. All values are 2010 prices, discounted to 2010.		Central Government Funding £284.1m		N/A	£284.1m		
	Indirect Tax Revenues	There would be some increase in tax being paid to the Exchequer.		Central Government Funding Wider Public Finances = £30.5m		N/A	£30.5m		

Appraisal Summary Table				Date produced:	Jan-18	Contact:				
Name of scheme:		A358 Taunton to Southfields - Blue Option				Name		David Stock		
Description of scheme:		The Scheme intends to provide a dual carriageway on the A358 between Taunton and Southfields roundabout in Somerset. The Scheme links the A303 at Ilminster with the M5 at Taunton and is likely to include grade separated junctions and the removal of at-grade junctions and direct accesses. The Blue Option commences at the M5 approximately 2km south of Junction 25. The route initially passes south of Hayden and north of Stoke Wood, and continues in a south easterly direction for 2.5km to join up with the existing A358 corridor at West Hatch Lane. There would be online widening of the existing A358 between West Hatch Lane and Southfields Roundabout.				Organisation		Highways England		
						Role		Promoter/Official		
Impacts		Summary of key impacts			Assessment					
					Quantitative		Qualitative			
					Value of journey time changes (£)		Monetary £(NPV)			
					Net journey time changes (£)		Distributional 7-pt scale/ vulnerable grp			
					0 to 2min		2 to 5min			
					> 5min					
Economy	Business users & transport providers	Journey Time Benefits by converting a single carriageway section to modern dual carriageway with associated junction improvements. Net journey time changes is the net of positives and negatives in a given time band. Monetary (NPV) includes both journey times and vehicle operating cost impacts.			£262.7m		N/A		£239.1m	Yes
	Reliability impact on Business users	Reliability benefits by converting a single carriageway section to modern dual carriageway with associated junction improvements.			N/A		N/A		£26.3m	
	Regeneration	N/A			N/A		N/A		N/A	
	Wider Impacts	Positive impact on jobs and GVA growth has been identified using a bespoke approach aligned to the emerging WebTAG units on Wider Impacts - full description provided in the A358 Taunton to Southfields Land Use and Economic Development Report, July 2016.			Growth of approx. 630 jobs and £37.7 million annual GVA.		N/A		N/A	
Environmental	Noise	The WebTAG noise appraisal for the Blue Option indicates an overall net improvement in noise within the study area. The provision of a link road to Junction 25 would divert traffic onto the new road, and the option also passes through a rural area, with a low population density, resulting in increased overall noise benefits as traffic would move away from residential areas. The positive impact of the diversion is sufficient such that the overall appraisal with respect to noise indicates a net benefit.			Households experiencing increased daytime noise in forecast year: 251. Households experiencing reduced daytime noise in forecast year: 495. Households experiencing increased night time noise in forecast year: 79. Households experiencing reduced night time noise in forecast year: 385		n/a		NPV= £2,204,368 (Positive value indicates net benefit)	Yes
	Air Quality	The WebTAG local air quality assessment results show there is a net improvement in local air quality within the study area. The Scheme does not result in an exceedance of the NO2 or PM10 air quality objectives or limit values. The regional assessment predicts an increase in emissions of NOx and PM10 primarily as a result of the rerouting of vehicles on to the M5 away from surrounding A and B roads between Exeter and Taunton, resulting in a longer route for vehicles when approaching via the A303. Reduced vehicle numbers on roads such as the A30 and A373 where there are high numbers of receptors has the effect of improving local air quality in these areas. Overall, the total change in NPV is positive indicating a net benefit in air quality when considering both local and regional effects.			Local Air quality effects at properties (Improvements / No effect / Deterioration) NO2 2023 (9656/ 192 / 5316) PM10 2023 (4738 / 6585 / 3841) Overall Assessment Score (negative score reflect benefit) NO2: (2023): minus -1166.8 PM10: (2023): minus -197.6 Change in Regional Emissions NOx (2023): 26.1 t/year PM10 (2023): 1.5 t/year		N/A (Guidance states that this column should not be used for AQ)		Value of change in PM concentrations: NPV: £896,858 Value of change in NOx emissions: NPV: minus -£717,345 Total value of change in air quality NPV: £179,513 (Positive value reflects net benefit)	Yes
	Greenhouse gases	Increase in GHG emissions are due to increased fuel consumption, which is related to slightly longer distances travelled by vehicles.			Change in non-traded carbon over 60y (CO2e) 365,117 tonnes Change in traded carbon over 60y (CO2e) 344 tonnes		N/A (Guidance states that this column should not be used for GHG)		-£16,589,054	
	Landscape	This option, would in the most part either run in close proximity to the existing A358 or online as it does in most of the middle part. The scheme would then diverge through open countryside across agricultural fields and vegetated boundaries. The scheme would be in close proximity to designated assets, including Listed Buildings and Registered Parks and Gardens, although would only have an indirect impact. This scheme option would be visible from local visual receptors such as residential properties and Public Rights of Way. The new junctions at West Hatch and Ashill would increase the level of disturbance, as well as, the new link connecting to Junction 25.			N/A		Large Adverse		N/A	
	Townscape	N/A			N/A		N/A		N/A	
	Historic Environment	The Blue Option has a scale of impact on the historic environment: large adverse on the buried archaeology, Slight Adverse on Grade II Listed Buildings and Slight Adverse on Grade II* Listed Buildings. This results in an overall Large Adverse impact. The primary concern is the removal/destruction of any buried archaeology located within the route option.			N/A		Large Adverse		N/A	
	Biodiversity	There would be an overall Moderate Adverse effect on biodiversity as a result of Blue Option. The Option presents a Moderate Adverse effect to the six Local Wildlife Sites within the footprint of the Option and a Slight Adverse effect to the four Special Areas of Conservation designated for bat conservation within 30km of the route. The loss of habitats is considered to represent a Intermediate Negative magnitude of impact with a Moderate Adverse overall assessment score for those habitats listed on the Somerset Biodiversity Action Plan. The proposed works have the potential to affect bats, otters, water voles, kingfisher, dormice, reptiles, badgers, barn owls, white clawed crayfish, great crested newts, fish, invertebrates and nesting birds through the loss, fragmentation and isolation of habitats.			N/A		Moderate Adverse		N/A	
Water Environment	Careful consideration is required for the multiple new crossings of the Blue Option over the various watercourses (particularly West Sedgemoor Main Drain), potential alteration of groundwater level and the work in flood zone 3 and 2 (Taunton). The potential incorporation of SuDS and pollution control measures within the drainage design would prevent any adverse effects. A precautionary Slight Adverse score has been assigned without mitigation.			N/A		Slight Adverse		N/A		
Social	Commuting and Other users	Journey Time Benefits by converting a single carriageway section to modern dual carriageway with associated junction improvements. Net journey time changes is the net of positives and negatives in a given time bend. Monetary (NPV) includes both journey times and vehicle operating cost impacts.			£273.5m		N/A		£236.5m	Yes
	Reliability impact on Commuting and Other users	Reliability benefits by converting a single carriageway section to modern dual carriageway with associated junction improvements.			N/A		N/A		£27.3m	
	Physical activity	The Blue Option would require the severance of several PRoW. However, it is considered likely that most of the severed routes will be replaced in the form of a crossing footbridge or underpass if deemed necessary following the NMU survey results. Given that the majority of severed NMU routes are likely to be replaced, this option has the potential to result in changes to journey distances. At this stage, it is unknown whether journey distances will increase or decrease, and as such effects are considered to be Neutral.			N/A		Neutral		N/A	
	Journey quality	The Blue Option is anticipated to improve traveller care through the provision of new signage, gantries and lighting. New views would be provided to the surrounding area for travellers, although mitigation planting and sections of road in cutting would reduce views to the wider area. Traveller stress is predicted to reduce for the Blue Option, with the provision of new safety related infrastructure including new lane markings, a reinforced concrete barrier in the central reserve, cat's eyes and road studs, as well as NMU provisions reducing the likelihood of NMUs encroaching onto the A358.			N/A		Moderate Beneficial		N/A	
	Accidents	Reduction in the number of PIAs and casualties by converting the single carriageway sections to modern dual carriageway standard with associated junction improvements. (Negative values indicate an increase in casualties).			Reduction in casualties: Fatal=-1, Serious=43, Slight=255		N/A		£9.7m	Yes
	Security	Effects to security as a result of the Blue Option are anticipated to be Neutral as there are not anticipated to be any changes to security indicators as a result of the proposed option.			N/A		Neutral		N/A	No
	Access to services	The Blue Option is unlikely to alter access to services within the area, with side roads and junctions appropriately positioned to minimise impacts. Therefore the Blue Option is considered to have a Neutral impact.			N/A		Neutral		N/A	Yes
	Affordability	Changes to vehicle operating costs and therefore changes to affordability as a result of the Blue Option are not anticipated and this option is considered to have a Neutral effect on affordability.			N/A		Neutral		N/A	Yes
	Severance	The Blue Option has the potential to result in severance to pedestrian journeys to and from community facilities within 250m of this option. There is also potential for pedestrian journeys to facilities further than 250m from this option to be affected. In the absence of a detailed NMU strategy at this stage, it is considered that this option is likely to result in longer journey times and journey distances between community facilities. Mitigation measures to minimise these adverse effects would be developed as the scheme evolves, and would be likely to include new NMU networks and facilities such as footbridges and underpasses, linking community facilities and subsequently minimising severance. The Scheme could also result in relief from existing severance with traffic flows potentially reduced on the existing A358.			N/A		Moderate Adverse		N/A	Yes
	Option and non-use values	The scheme is expected to have little or no impact on option and non-use values			N/A		Neutral		N/A	
Public Accounts	Cost to Broad Transport Budget	The scheme would be funded through Central Government Funds. All values are 2010 prices, discounted to 2010.			Central Government Funding £266.3m		N/A		£266.3m	
	Indirect Tax Revenues	There would be some increase in tax being paid to the Exchequer.			Central Government Funding Wider Public Finances = £28.4m		N/A		£28.4m	

If you need help accessing this or any other Highways England information, please call **0300 123 5000** and we will help you.

