HIF Banwell Bypass and Highways Improvements Project

Options Appraisal Report

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1 The Project

1.1 Context

1.1.1 North Somerset Council's (NSC) Housing Infrastructure Fund (HIF) proposal supports potential housing sites (subject to the emerging Local Plan 2038).

1.1.2 A business case was submitted to Homes England to secure funding for a package of infrastructure improvements in February 2019 and a successful funding announcement was made at the end of October 2019.

1.1.3 A number of infrastructure improvements have been proposed including: a bypass of Banwell village; a package of online improvements to the existing surrounding road network; mitigation for impacts on the nearby flood plain; and improvements to the utility supply networks in the area.

1.1.4 The bypass would provide a highway connection to enable potential housing sites that may be allocated in the emerging Local Plan and alleviate the anticipated impact of further traffic growth upon the already congested Banwell village.

1.1.5 The bypass will include wider mitigation measures and could include other enhancements subject to further appraisal, design and consultation work.

1.1.6 NSC appointed Alun Griffiths (Contractors) Ltd, with Arup and TACP (the 'AGC Team') as their technical and environmental advisors, to develop a solution including optioneering, design and planning support of the proposed HIF Banwell Bypass and Highways Improvements Project Stage 1 (the "Scheme"). Stage 1 of the project includes: optioneering; preliminary design; Environmental Impact Assessment (EIA); planning permission; Statutory Processes. Stage 2 of the project is the detailed design and construction phase, following planning determination and land acquisition.

1.2 Scheme objectives

1.2.1 NSC's overall objectives for the Scheme (which must be delivered within cost, quality, and programme targets) are:

a) Improve the local road network to deal with existing congestion issues.

b) Improve and enhance Banwell's public spaces by reducing traffic severance and improving the public realm.

c) Provide the opportunity to increase active and sustainable travel between local villages and Weston-super-Mare.

d) Deliver infrastructure that enables housing development (subject to the Local Plan).

e) Ensure the development respects the local area and minimises visual impact upon the surrounding countryside and Mendip Hills Area of Outstanding Natural Beauty (AONB).

f) Innovative and efficient in reducing and offsetting carbon from the design and construction of the infrastructure.

g) Ensure the development provides the opportunity to increase Bio-Diversity Net Gain by at least 10%.

h) Proactively engage with stakeholders in a way that is both clear and transparent.

1.2.2 At Stage 1, NSC together with its AGC Team are responsible for:

a) the production of a preliminary design for the Scheme;

b) to obtain planning consent from the Local Planning Authority, and support the land acquisition and public inquiry process for the Scheme;

c) production of a final scope for Stage 2 of the Scheme (i.e. the Scope for the NEC4 engineering and construction contract for detailed design and construction);

d) production of an agreed target cost for Stage 2 of the Scheme, (the "Stage 2 Target Cost"); and

e) the provision of ancillary services (technical, commercial etc.) to bring about the above.

1.3 Purpose of this Report

1.3.1 This report is the Options Appraisal Report. Its aim is to review the need for intervention, followed by the identification and appraisal of options for transport infrastructure to meet the Scheme objectives.

1.3.2 A route options assessment was conducted as part of the HIF Business Case. The Option Selection Report[1] (WSP, July 2018) concluded that alignment Route 2 was the preferred option, but that this conclusion should be revisited once more detailed hydraulic modelling was available.

1.3.3 Since the publication of the Option Selection Report, the planning and legislative context around building roads, especially in the context of rising carbon / greenhouse gas emissions, has changed. The method of appraisal for transport schemes has also changed.

1.3.4 This Options Appraisal Report will therefore seek to confirm whether the conclusions reached in previous Scheme reporting are still valid, and whether they accord to current local and national policies and legislation.

1.3.5 This Options Appraisal Report concludes with a recommendation of a preferred option for the Scheme to take forward for further design development.

1.3.6 Following the conclusion of the public consultation on the Banwell bypass and highway improvements, this Options Appraisal Report shall be submitted to North Somerset Council's Executive Member Panel, along with a report on the public consultation responses. Following their review, the report shall be published on the North Somerset Council website with notification of the decision of the Preferred Route.

[1] 700036256-WSP-HGN-SWI-RE-CH-0005 – Options Selection Report

2 Background

2.1 Historical Background

2.1.1 Plans for a transport intervention at Banwell have been under consideration for many years.

2.1.2 A Banwell Transport Area Study was commissioned in 2000 assess transport options for the Banwell area. This study considered public transport interventions as well as highway based solutions. The Final Study Report (JMP Consultants Ltd, 2001) concluded a bypass route recommendation to the north of Banwell. The bypass seeks to address the study objective(s) to reduce congestion through the village. This recommendation forms the basis for the route that is currently safeguarded for planning purposes within the NSC Local Plan.[2] This safeguarded route is shown in Figure 1.

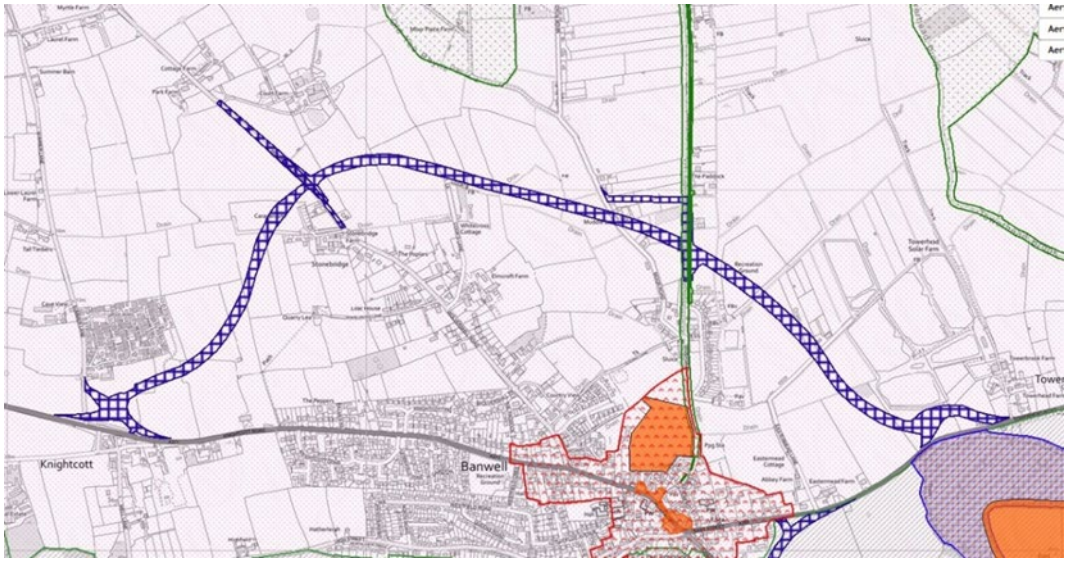

Figure 1: Route alignment that is safeguarded in the current Local Plan (© NSC)

2.1.3 In 2006, a Greater Bristol Strategic Transport Study (GBSTS) (Atkins, 2006) was conducted to review potential interventions which would improve strategic transport movements into and out of the greater Bristol region. One of the options considered within this study was a Banwell, Churchill and Sandford bypass. Due to funding availability, early assessments of this option envisaged a phased approach to bypass delivery. The current Housing Infrastructure Fund requirements do not

[2] http://map.n-somerset.gov.uk/PoliciesMap.html

align with the time needed to deliver such an extensive bypass network, with the costs considered prohibitive at this time. As such this option has not been taken forward to a shortlist.

2.1.4 In 2018, an options appraisal study was conducted to review potential route alignment options for the provision of a new highway link to connect a potential strategic development location for housing to the existing highway network. This options appraisal study was undertaken to support a business case for funding from the Ministry of Housing, Communities and Local Government's Housing Infrastructure Fund (HIF). The purpose of the appraisal study was to assess whether the safeguarded route was still the most appropriate alignment for the new highway. The Option Selection Report (WSP, July 2018) – hereafter referred to as the 2018 OSR – recommended that a route referenced as Option 2, which is an alignment that is broadly aligned with the route currently safeguarded in the existing Local Plan, should continue to be the preferred route subject to further technical assessments (namely flooding and traffic).

2.1.5 In 2019, NSC successfully secured £97.1m of funding from Homes England's HIF to deliver essential infrastructure projects to support the growing population, whist also unlocking potential housing sites to meet any need for additional new homes over the next 15 years.

2.1.6 The HIF funding will be used to deliver the Scheme, alongside a package of improvements to nearby roads and pathways, improvements to the area's utility supply networks, and an expansion of Winterstoke Hundred Academy secondary school in Locking Parklands.

2.1.7 Whilst the Scheme is funded through the HIF, the Scheme is required irrespective of any housing development that it would enable.

2.2 Study Area

2.2.1 A 5km study area has primarily been adopted for this options appraisal. Some areas of assessment, such as the traffic model, extend further than this to analyse wider impacts, and some areas will be less than 5km depending on the assessment category.

2.2.2 The approximate extent of the wider study area is shown in Figure 2.

2.2.3 This Options Appraisal Report focusses primarily on the A371/A368

route corridor through Banwell.

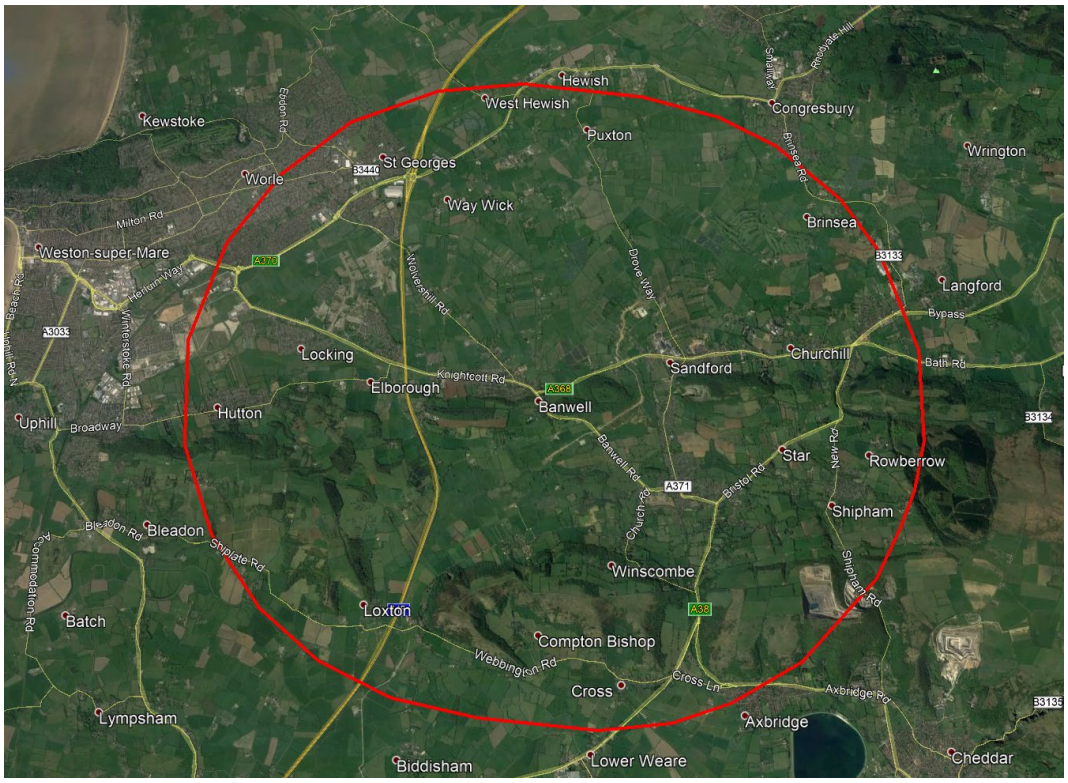

Figure 2: 5km Study Area (© Google)

2.3 Existing Conditions

2.3.1 The current highway network through Banwell (the A371 and A368) generally comprises a single carriageway road with one lane in each direction. The routes pass through the villages of Banwell, Churchill, Sandford, Winscombe and Locking. The sections of the highway between the villages provide access to residential and agricultural properties.

2.3.2 The A368 forms the northern boundary of the Mendip Hills (AONB) whilst the A371 between Banwell and Winscombe passes through the AONB. The A368 passes along the northern edge of the North Somerset and Mendip Hills Bat Special Area of Conservation (SAC). The A371 and A368 through Banwell both run through the Banwell Conservation Area.

2.3.3 Between villages the roads are bordered by high hedges and are integrated into the landscape. They are only intermittently visible from points away from the highway.

2.3.4 The A371 is the main route from Weston-super-Mare to Banwell. The route passes through Banwell and continues in a generally south-easterly direction onto Winscombe, Cheddar, Wells, and eventually terminates in a junction with the A303 at Wincanton. A section of this road through Banwell reduces down to a single lane of traffic. At certain times of the day this causes congestion, journey time delays, and uncertainty.

2.3.5 The A368 corridor runs along the northern edge of the Mendip Hills AONB. Starting at Banwell, it forms part of the main route from Weston-super-Mare in the west to Bath in the east.

2.3.6 The A368 between Banwell and Churchill is well used as a school route by children, parents & carers, on foot and cycling. The route is generally narrow in character, and beyond the village centres there is a lack of suitable walking/cycling facilities along its length. There are some areas towards Churchill where the road narrows and the centreline has been removed.

2.3.7 These sections of highway are, for the most part, restricted to posted speed limits of 30mph and 40mph. The A371 has only 1km of highway at the national speed limit, and 600m at a posted limit of 50mph, within the study area. The A368 also has only 1km of highway at the national speed limit within the study area.

3 Information informing Options Appraisal

3.1.1 This options appraisal builds on the appraisal undertaken as part of the 2018 OSR. That report concluded that Option 2, the alignment currently safeguarded within the Local Plan, should continue to be the preferred route, but that this should be revisited once more detailed traffic and hydraulic modelling has been undertaken.

3.1.2 Several other high-level considerations have been undertaken as part of the options appraisal process to inform and aid the route optimisation process, along with a non-statutory public consultation, which sought views on the existing use of the local road network, the preferred route option and any possible additional mitigation and enhancement measures. These are:

a) Traffic considerations;
b) Flooding;
c) Walking, cycling and horse-riding considerations;
d) Ecological Constraints, Mitigation & Enhancement;
e) Biodiversity Net Gain;
f) Environment Screening and Scoping Report;
g) Landscape Monetisation Appraisal;
h) Carbon Options considerations; and
i) Public Consultation

3.1.3 A high-level overview of the above considerations, together with a summary of the results of the public consultation, are outlined within this section of the report. This Options Appraisal Report can be considered as the 'umbrella' report, which considers the high-level outcomes of the various other detailed assessments in the determination of the preferred route. Once the preferred route is determined, full assessments will be carried out to cover all aspects of the proposal. The results of these considerations will inform the final design which will form part of the planning application to be submitted.

3.1.4 A separate report outlining the public consultation responses, is published alongside this Options Appraisal Report.

3.2 Traffic Considerations

3.2.1 Since the publication of the 2018 OSR, further traffic modelling has been undertaken by NSC in accordance with the Department for Transport (DfT) Transport Appraisal Guidance (TAG). The outcomes of this traffic modelling are discussed in greater detail within section 7.2 of this report.

3.3 Flooding

3.3.1 A 1D hydraulic model of the Scheme study area was produced in 2012. This model was produced jointly by NSC and the Environment Agency (EA) to aid the delivery of a flood defence scheme. The results of this model have been reviewed as part of this options assessment.

3.3.2 Further survey work was also undertaken in June 2021. The results of these surveys shall be assessed during the design development of the Scheme.

3.4 Walking, Cycling & Horse-riding Assessment

3.4.1 A Walking, Cycling and Horse-riding (WCH) Assessment has been undertaken for the Scheme in accordance with GG 142[3]. The WCH Assessment has identified the needs of those walking, cycling and horse-riding within the route selection process.

3.4.2 The WCH Assessment outlines potential user opportunities for the improvement of links for walking, cycling and horse-riding. This will enable further considerations of enhancements that support the wider strategy for the area and will provide opportunities to identify improvements that may be delivered both as part of the Scheme and in the future by others.

3.4.3 The outcomes of the WCH Assessment have been considered within the overall Options Appraisal Report.

[3] DMRB - GG 142, Walking, Cycling and Horse-riding Assessment and Review

3.5 Ecological Constraints, Mitigation & Enhancement

3.5.1 An Ecological Constraints, Mitigation, and Enhancement Parameters Plan (ECMEPP) has been produced to inform and aid the optimisation of the route selection process.

3.6 Biodiversity Net Gain

3.6.1 A Biodiversity Net Gain (BNG) assessment has been undertaken, using the DEFRA 2.0 biodiversity metric toolkit for the shortlisted route options. Further qualitative advice is also provided to inform the options appraisal in accordance with BNG good practice principles (Baker, et al., 2019).

3.7 Environmental Screening and Scoping Report

3.7.1 A screening and scoping report has been prepared which is subject to stakeholder consultation. This has identified environmental opportunities and constraints that have been considered as part of the optioneering. An Environmental Liaison Group meeting has also been held which has included stakeholder liaison.

3.8 Landscape Monetisation Appraisal

3.8.1 A landscape monetisation appraisal has been undertaken, in accordance with the DfT Value for Money Guidance, where the area of landscape influenced by the proposed development is translated into costs to produce a quantitative figure for inclusion within the Scheme option costs. This has considered the impact of the proposed development upon the Mendip Hills AONB.

3.9 Carbon Options Assessment

3.9.1 A Carbon Options Assessment has been undertaken for the shortlisted route options. This assessment includes embodied and user carbon emissions based on the information available at the time of writing. The outcome of this assessment has been used to inform the Options Appraisal process. Full details of the assessment are provided in the Carbon Options Assessment Report.

3.10 Public Consultation

3.10.1 A public consultation was undertaken between 5 July and 16 August 2021. The purpose of this consultation was to seek the public's views on the Banwell bypass and specific views on:

a) How the public uses the A371 and A368 roads and what the existing problems are;

b) The favoured Banwell bypass route; and

c) Possible additional mitigation or enhancement measures within Banwell and the wider road network.

3.10.2 The results of this public consultation are covered in detail within the "Banwell Bypass and Highways Improvements Consultation" response report. A summary of the key themes that came out of the consultation are:

a) Concern over traffic increases in neighbouring towns / villages (primarily Sandford, Churchill, and Winscombe);

b) support for a bypass of all communities along A368, eventually connecting into the A38 to the east;

c) support for Route Option 2 as the route that best meets the scheme objectives;

d) there is a preference to provide an overbridge at Riverside to reduce potential traffic increases along Riverside;

e) there is concern about the impact that Route Option 2 would have on Banwell football club and associated recreation area;

f) concerns over potential future housing being provided between a proposed bypass and existing residential area in Banwell;

g) concerns over communities becoming disconnected/severed (comments primarily relate to potential severance of Riverside from rest of Banwell;

h) concern of a new bypass being close to residential areas, with key concerns over air quality and noise pollution;

i) concerns of the route impacting upon the existing countryside, footpaths / bridleways, the AONB and bat caves;

j) comments raised about junction consideration (to also facilitate horse-riders);

k) agreement / support for proposed southern link; and

l) support for further traffic calming measures within Banwell, such as:

i. one-way system / traffic lights proposal to prevent driver frustration.
ii. incorporation of cycling and walking networks.
iii. reinstatement of the square in the centre of Banwell.

3.10.3 The outcomes of the consultation have been considered as part of the options appraisal. Specific concerns will be addressed during the design development.

4 Appraisal Methodology

4.1 Overview

4.1.1 The approach taken to appraising potential transport interventions for this Options Appraisal follows the assessment methodology outlined within the WebTAG 'Transport Appraisal Guidance' (TAG).[4]

4.1.2 The TAG process identifies the key social & cultural, environmental, and economic assessment areas and specifies a method to measure the impacts of each option. The list of assessment criteria is outlined in Appendix D.

4.2 Appraisal Method

4.2.1 The assessment comprises two stages:

a) Review of a long list of options; and
b) Further appraisal of the shortlisted options.

4.3 Review of a long list of options

4.3.1 A long list of options has been considered with a high-level appraisal for each option against the different WebTAG criteria (social & cultural, environment, and economic).

4.3.2 The list of assessment criteria is outlined in Appendix D, and they fall under the following headings:

a) Environmental;
b) Social & Cultural;
c) Economic;
d) Public Accounts and Indicative Benefit Cost Ratio (BCR); and
e) Distributional Impacts.

4.3.3 The appraisal of the long list of options is summarised in a series of tables included within section 5 of this report.

[4] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/938766/tag-transport-appraisal-process.pdf

4.4 Appraisal of Shortlisted Options

4.4.1 Following the sifting of the long list of options, options that best aligned with the Scheme objectives (as listed in 1.2.1 and Table 2) and that best met the WebTAG criteria were shortlisted to be taken forward for a more detailed appraisal.

4.4.2 The WebTAG process identifies the key assessment areas and specifies a method to measure the impacts of each option.

4.4.3 The methodology adopted in appraising the significance and scale of identified impacts uses the seven-point assessment scale outlined within Table 1.

Table 1: Seven Point Assessment Scale

Large beneficial	+++
Moderate beneficial	++
Slight beneficial	+
Neutral	0
Slight adverse	-
Moderate adverse	- -
Large adverse	- - -

4.4.4 As well as the assessment criteria listed in Appendix D, each shortlisted option was also assessed against the Scheme objectives. The Scheme objectives are repeated in Table 2, and are classified as either a *strategic* objective (i.e. why the Scheme is needed) or a *delivery* objective (i.e. objectives to take into account during the design of the Scheme). A delivery objective is considered to apply to any of the transport interventions appraised. As such, they are not considered in as much detail as the strategic objectives at this stage.

Table 2: Scheme objectives and classification of objectives

Scheme Objective	Classification
Improve and enhance Banwell's public spaces by reducing traffic severance and improving the public realm.	Strategic Objective
Provide the opportunity to increase active and sustainable travel between local villages and Weston-Super-Mare.	Strategic Objective
Improve the local road network to deal with existing congestion issues irrespective of any housing development it would enable.	Strategic Objective
Infrastructure that enables housing development (subject to the Local Plan).	Strategic Objective
To be innovative and efficient in reducing and offsetting carbon from the design and construction of the infrastructure.	Scheme Delivery Objective
To ensure the development provides the opportunity to increase Bio-Diversity Net Gain by at least 10%.	Scheme Delivery Objective
To proactively engage with stakeholders in a way that is both clear and transparent.	Scheme Delivery Objective
Ensure the development respects the local area and minimises visual impact upon the surrounding countryside and Mendip Hills AONB.	Scheme Delivery Objective

4.4.5 The assessment of all route options has had input from all key disciplines relates to the design and environmental assessment of highways. A preliminary / kick-off meeting was held to set the parameters of the assessment. This kick-off meeting triggered an assessment period during which the Options Assessment Matrix was populated (which is incorporated within the following sections of this report).

4.4.6 A collaborative WebTAG review session was held with all disciplines contributing to the assessment review. The WebTAG assessment is a high-level assessment. Detailed environmental assessment shall be undertaken on the preferred route. The approach to the detailed environmental assessment is outlined within the environmental Screening and Scoping Report.

5 Long List of Options

5.1 High level option review

5.1.1 A long list of options have been identified to reduce current traffic in Banwell. These have been assessed at a high level against the WebTAG criteria (social & cultural, environment, and economic) as well as the relevant strategic Scheme objectives (as defined in Table 2).

5.1.2 The long list of options that were identified and assessed as part of the options appraisal are as follows:

a) **Do-nothing** – consideration of not making improvements;

b) **Reduce the need to travel** – consideration of supporting home working, locating more amenities closer to where people live, improving access to fast and reliable broadband, and encouraging deliveries to use more sustainable travel choices, especially for 'last-mile' deliveries;

c) **Public transport and sustainable travel choices** - improvements to public transport and active travel opportunities such as walking and cycling around Banwell, have been considered;

d) **Road improvements through Banwell** – widening and improving the existing A371 and A368 through the centre of Banwell;

e) **Bypass of Banwell, Churchill and Sandford** - A lengthier bypass of Banwell with Churchill and Sandford

f) **Southern bypass of Banwell** – a bypass route to the south of Banwell, through the Mendip Hills AONB, from the A371 (west of Banwell) to the A368 (east of Banwell);

g) **Northern bypass of Banwell** - a bypass route to the north of Banwell from the A371 (west of Banwell) to the A368 (east of Banwell). Any northern bypass route would include a southern link[5] between the A368 to A371 Castle Hill;

h) **National Grid haul route** - the temporary access road associated with National Grid's Hinkley Point C Connection Project has been considered as an alternative to the southern link[8].

[5] The inclusion of a "southern link" as part of a northern bypass route has been considered. This is discussed in greater detail in section 7.5 of this report.

5.1.3 The tables provided in this section provide an evaluation of the options outlined in section 5.1.2. Greater detail is provided within Appendix E.

5.1.4 In summary, the route option that aligns the best with the WebTAG criteria and Scheme objectives is the northern bypass of Banwell. This has been taken forward for further detailed assessment:

5.1.5 In accordance with the relevant TAG[6] and the Green Book guidance[7], an appraisal of potential transport interventions requires the comparison of conditions where a potential Scheme is built, against conditions where a Scheme is not built. As such, whilst the appraisal of the Do-nothing option indicated that it did not align with the WebTAG criteria and Scheme Objectives, it has been carried forward to be used as a reference case (baseline) for the comparison of an appraisal of the do something option, being a northern bypass of Banwell.

5.1.6 Whilst reducing the need to travel, public transport improvements, and online improvements through Banwell have been discounted at this stage, these options in the surrounding area could be complementary to a northern bypass scheme and should not be discounted entirely. The implementation of one or all of these options would complement many of NSC's policies including (but not limited to):

a) Decarbonisation;
b) transport & movement;
c) healthy and safe communities; and
d) improving quality of life.

[6] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/938766/tag-transport-appraisal-process.pdf

[7] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/938046/The_Green_Book_2020.pdf

5.2 Do-Nothing

High Level Option Assessment			
Description			
No improvements above and beyond any committed / likely development in the area. The Do-Nothing option would not include the safeguarded bypass route, nor would it include the potential housing for residential allocation which is subject to the emerging Local Plan process.			
		Benefits	**Detriments**
WebTAG / Sustainable Development Criteria	**Social & Cultural**	None identified.	Forecasted increase in traffic would adversely affect journey times, access to services, and active travel opportunities.
	Environment	Little / no impact on biodiversity.	No improvements to air quality & noise as there would be no change to traffic levels through Banwell.
	Economic	No capital investment required.	Forecasted increase in traffic would adversely affect journey times for business users and travel operators.
Strategic Objectives	**Enables housing development**	None identified.	Would not enable housing development.
	Improves and enhances Banwell's public realm	None identified.	Limited opportunity to enhance Banwell's public realm due to forecasted increase in traffic volume.
	Increases active & sustainable travel	None identified.	Limited opportunity to increase active travel / sustainable travel opportunities due to forecasted increase in traffic volume.
	Solves existing congestion issues	None identified.	Traffic congestion would rise with the forecasted increase in traffic through Banwell.
Summary and decision:		This option would not solve the existing issues within Banwell and would not support the delivery of housing within the wider region.	

5.3 Reduce the need to travel through Banwell

High Level Option Assessment			
Description			
Reduce the need to travel by; • supporting remote working; • locating more amenities closer to where people live; • improving access to fast and reliable broadband; and • encouraging deliveries to use more sustainable travel choices especially for 'last-mile' deliveries.			
		Benefits	**Detriments**
WebTAG / Sustainable Development Criteria	**Social & Cultural**	Improved accessibility to services.	Impact predicted to be low due to low public uptake. The public would still rely on personal vehicular journeys and not all employment can rely on remote working. May not solve existing congestion issues.
	Environment	Reduction in Greenhouse gases. Little / no impact on biodiversity, landscape, townscape, and historic environment	No improvements to air quality & noise as there would be no change to traffic levels through Banwell. Relocating amenities could have impacts on landscape/townscape & historic environment.
	Economic	Opportunity for economic growth due to improved productivity (due to improvements in digital infrastructure and reduction in travel time to work).	Impact predicted to be low due to low public uptake. May not solve existing congestion issues. Implementation costs may be high and on-going.
Strategic Objectives	**Enables housing development**	None identified.	Would not enable housing development.
	Improves and enhances Banwell's public realm	None identified.	Limited opportunity to enhance Banwell's public realm due to limited reduction in traffic volume.
	Increases active & sustainable travel	None identified.	Limited opportunity to increase active travel / sustainable travel opportunities due to limited reduction in traffic volume.
	Solves existing congestion issues	Slight reduction in traffic volumes predicted.	Limited reduction in traffic volume, which would be offset by increased traffic from housing development.
Summary and decision:		This option has been discounted as a stand-alone option, however reducing the need to travel could be complementary to another Scheme option.	

5.4 Public Transport and Sustainable Travel

High Level Option Assessment			
Description			
Improvements have been considered within the wider study area to public transport provision, service timetabling, improved facilities etc. These improvements have been combined with active travel opportunities such as walking and cycling.			
		Benefits	**Detriments**
WebTAG / Sustainable Development Criteria	**Social & Cultural**	Improved accessibility to services. Opportunities for Journey quality/physical activity improvements. Slight reduction of accidents with fewer vehicles on the road, slightly improves security. Improved benefit upon severance.	Impact predicted to be low due to predicted low public uptake. The public would still rely on personal vehicular journeys and not all employment can rely on remote working. May not solve existing congestion issues.
	Environment	Reduction in Greenhouse gases. Little / no impact on biodiversity. Slight benefits to noise and air quality for primarily short journeys.	Limited improvements to air quality & noise as there would be no change to traffic levels through Banwell..
	Economic	Slight improvement for business users and transport providers reliability and journey time. Opportunities for leisure/tourism/commuting routes, slight improvement to local economy.	Impact predicted to be low due to low public uptake. May not solve existing congestion issues. Implementation costs may be high and on-going maintenance costs. Cost of scheme and impact on NSC transport budget.
Strategic Objectives	**Enables housing development**	None identified.	Would not enable housing development.
	Improves and enhances Banwell's public realm	New travel networks are an opportunity for public realm improvements. Active travel infrastructure would improve connectivity and benefit the public realm.	Limited opportunity to enhance Banwell's public realm due to limited reduction in traffic volume. Limited space to provide segregated active travel infrastructure.
	Increases active & sustainable travel	Some opportunity to improve journey quality and physical activity through active travel measures.	Limited opportunity to increase active travel / sustainable travel opportunities due to limited reduction in traffic volume.
	Solves existing congestion issues	Slight reduction in traffic volumes predicted.	Benefit limited if there is low public uptake.
Summary and decision:		This option has been discounted as a stand-alone option, however improvements to public transport and active travel could be complementary to a different Scheme option to improve overall travel options in the area.	

5.5 Online highway improvements within Banwell

High Level Option Assessment			
Description			
The widening of existing roads and/or junctions through Banwell. The widening proposals considered would require land being allocated to facilitate the wider road. As such, buildings would likely need to be demolished and Compulsory Purchase Orders (CPO) would likely be required.			
		Benefits	**Detriments**
WebTAG / Sustainable Development Criteria	**Social & Cultural**	Improved accessibility to some services. Slight improvement to journey quality. Slight reduction in conflict along single lane, reductions in accidents and security.	Demolished buildings may adversely affect journey quality of travellers' views within the Historic centre and wider afield, affects quality of the environment. Traffic is likely to increase. Demolition of buildings may result in loss of community cohesion.
	Environment	Improvements to air quality due to free-flow conditions of traffic as opposed to current idling conditions.	Increase in noise due to faster speeds of vehicles. Adverse impact for townscape and historic environment. Minor adverse ecological impact.
	Economic	Improved journey times and accessibility.	Adverse impacts to journey costs. Loss of retail/business units would harm local economy. Cost of scheme and impact on NSC transport budget.
Strategic Objectives	**Enables housing development**	Increase in road capacity would enable some housing development	Would not enable housing development.
	Improves and enhances Banwell's public realm	None identified.	Loss of Banwell's Historic fabric, landscape, and Conservation Area
	Increases active & sustainable travel	Some potential for provision of footways alongside road widening.	Limited opportunity to increase active travel / sustainable travel opportunities due to limited reduction in traffic volume. Road improvements would have to be considerable to allow opportunities for active travel measures
	Solves existing congestion issues	Slight reduction in traffic conflict.	Traffic volume through Banwell would continue to increase.
Summary and decision:		This option has been discounted as it does not facilitate the new housing at the proposed strategic development locations, and would result in numerous adverse impacts within Banwell (e.g. noise, air quality, etc.)	

5.6 Bypass of Banwell, Churchill & Sandford

High Level Option Assessment			
Description			
This option has been considered and would include a longer bypass being implemented for Banwell, Churchill and Sandford (between the M5 and A38). The bypass would be located to the north of the villages.			
		Benefits	**Detriments**
WebTAG / Sustainable Development Criteria	**Social & Cultural**	Improved journey quality, fewer accidents and physical activity improved through Banwell. Improved social cohesion due to removal of traffic.	Increased severance.
	Environment	Improvement in air quality and noise in Banwell. Improvements to townscape, and historic environment. Decrease in traffic volumes in surrounding villages.	Loss of landscape, historic environment, close to SSSIs and wider environmental impacts due to the increased length. Adverse greenhouse gas impact.
	Economic	Slight benefit to journey costs. Benefit to journey time reliability.	Unaffordable within the available budget.
Strategic Objectives	**Enables housing development**	Enables housing development.	None identified.
	Improves and enhances Banwell's public realm	Opportunities for public realm works in Banwell.	None identified.
	Increases active & sustainable travel	Opportunities for active and sustainable travel through Banwell.	Risk of greater severance of existing active and sustainable travel routes.
	Solves existing congestion issues	Reduction in traffic volumes predicted.	None identified.
Summary and decision:		The larger scheme would result in more harm to the environment. It would be unaffordable within the available budget. As such, this option has not been taken forward to a shortlist.	

5.7 Southern alignment for bypass of Banwell

High Level Option Assessment			
Description			
A bypass route to the south of Banwell. This option considers a bypass to the south of the village, south of Banwell Castle, linking up with the A368 east of Banwell fort. The route would pass through the Mendip Hills AONB.			
		Benefits	**Detriments**
WebTAG / Sustainable Development Criteria	**Social & Cultural**	Improved accessibility to services, journey quality and less severance. Improved security as a result of less accidents. Improved social cohesion due to removal of traffic.	Loss of landscape and historic environment.
	Environment	Improvement in air quality and noise in Banwell. Improvements to townscape, and historic environment.	Adverse impacts to landscape, biodiversity, and water environment. Option would have direct adverse impacts on AONB, SAC, SSSI and other designated areas. There may be an increase in traffic volumes on surrounding villages.
	Economic	Slight benefit to journey costs. Benefit to journey time reliability.	Moderate costs to protect areas. Cost of scheme and impact on NSC budget.
Strategic Objectives	**Enables housing development**	None identified.	Would not enable housing development at the proposed strategic development location.
	Improves and enhances Banwell's public realm	Opportunities for public realm works in Banwell	None identified.
	Increases active & sustainable travel	Opportunities for active and sustainable travel through Banwell.	None identified.
	Solves existing congestion issues	Reduction in traffic volumes predicted.	Users from the north may still have to go through Banwell to access the bypass.
Summary and decision:		This option has been discounted given the highly constrained nature of the land to the south of Banwell. A bypass in this location would have adverse environmental impacts on biodiversity and landscape.	

5.8 Northern alignment of bypass for Banwell

High Level Option Assessment			
Description			
A bypass route to the north of Banwell. This option would involve a bypass to the north of the village, passing between the A371 and A368 via Wolvershill Road.			
		Benefits	**Detriments**
WebTAG / Sustainable Development Criteria	**Social & Cultural**	Improved accessibility to services, security, journey quality, physical activity. Reduce accidents and severance. Improved social cohesion due to removal of traffic.	Potential severance of existing walking, cycling and horse-riding leisure routes.
	Environment	Improvement in air quality and noise in Banwell. Improvements to townscape, and historic environment.	Adverse impact to biodiversity, water environment and historical sites outside the centre of Banwell. Proposed route would cross a flood plain. Increase in greenhouse gases. There may be an increase in traffic volumes on surrounding villages.
	Economic	Benefits to business and transport users. Journey reliability improved. Encourage users to visit Banwell local economy.	Cost of scheme (funding through HIF).
Strategic Objectives	**Enables housing development**	It would enable housing development at strategic development location.	None identified.
	Improves and enhances Banwell's public realm	Placemaking opportunities in Banwell due to reduction in traffic.	None identified.
	Increases active & sustainable travel	Opportunities for active travel and sustainable travel through Banwell.	Potential severance of existing public rights of way
	Solves existing congestion issues	Reduction in traffic volumes predicted.	None identified.
Summary and decision:		This option scores well against the scheme objectives and WebTAG criteria. Further assessment should be undertaken.	

5.9 Use of National Grid Haul Route

High Level Option Assessment			
Description			
The temporary road associated with National Grid's Hinkley Point C Connection Project has been considered as an alternative to the Southern Link. This option would need to be provided in combination with a bypass as it would not address congestion issues in Banwell on its own. This haul route has been constructed on a temporary basis and is subject to its own planning permission, which outlines that the land will be returned to its former condition when work is complete. Castle Hill and Dark Lane would remain open for traffic between Banwell and Winscombe.			
		Benefits	**Detriments**
WebTAG / Sustainable Development Criteria	**Social & Cultural**	Limited improvements to accessibility for short term.	This option would still result in a large proportion of traffic travelling through Banwell to reach Winscombe. It would not alleviate traffic congestion in Banwell for drivers travelling this route.
	Environment	Slight reduction in Greenhouse gases. Slight improvements to air quality and noise in the short term.	Adverse impact to biodiversity.
	Economic	None identified.	Forecasted increase in traffic would adversely affect journey times for business users and travel operators.
Strategic Objectives	**Enables housing development**	None identified.	Would not enable housing development.
	Improves and enhances Banwell's public realm	None identified.	Limited opportunity to enhance Banwell's public realm due to limited reduction in traffic volume.
	Increases active & sustainable travel	None identified.	Limited opportunity to increase active travel / sustainable travel opportunities due to limited reduction in traffic volume.
	Solves existing congestion issues	None identified.	Forecasted traffic increase would result in congestion still existing through Banwell.
Summary and decision:		This option has been discounted as the haul route has been constructed on a temporary basis. It would have adverse impacts to environment if permanent. Congestion issues would still exist through Banwell.	

6 Shortlisted Options

6.1 Overview

6.1.1 Of the long list of options, a northern bypass of Banwell was the only do-something option carried forward for more detailed optioneering and appraisal as part of the shortlist. In accordance with TAG and the Green Book guidance, the 'Do Nothing' option will be the reference case for option appraisal comparison purposes.

6.1.2 The 2018 OSR outlined three different alignment options for a northern bypass. The three northern alignment route options were revisited to consider the assessments outlined in Chapter 4. Having reviewed the three route options they are considered to be sufficient for a detailed options appraisal. They are considered to be valid and no further route alignment options have been identified for further detailed options appraisal.

6.1.3 The route options that have been carried over for detailed assessment are shown on Figure 3. A Route Options Plan is included within Appendix A. The following paragraphs within this section describe the routes under consideration within the shortlisted options appraisal. This includes the baseline position as the 'Do Nothing' option. The common route alignment is called such because it is the part of the bypass that is common to all three route options.

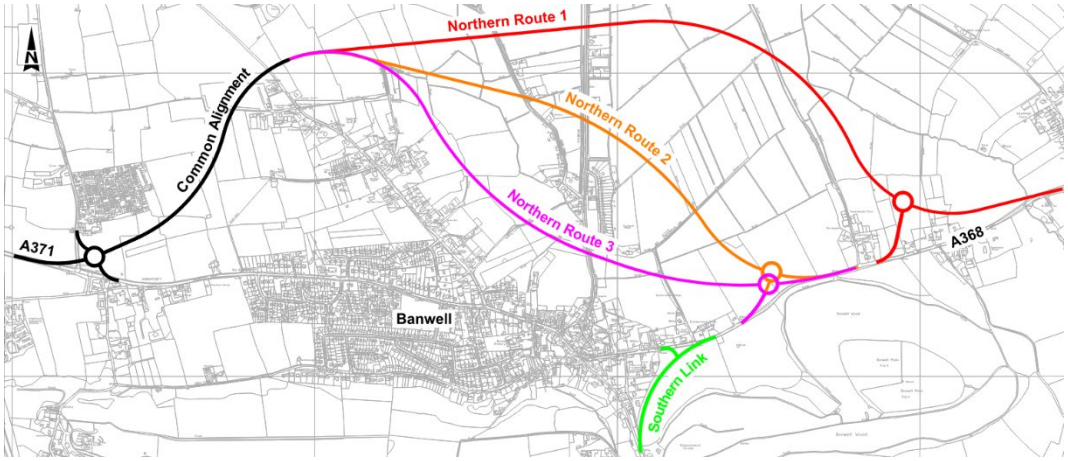

Figure 3: Shortlisted Route Options subject to further assessment

6.1.4 Whilst the options for reducing the need to travel, public transport and sustainable travel, and online highway improvements, are not considered to be able to meet the Scheme objectives in their entirety, they would be complementary to a northern route Scheme. These measures will be considered further during the developing design of the preferred route.

6.2 Do-Nothing

6.2.1 This scenario considers doing nothing to solve the problems and issues that currently occur in Banwell. A WebTAG assessment has been undertaken to assess the predicted social and cultural, environmental, and economic future impacts should no form of highway improvement take place.

6.2.2 The assessment of the predicted future impacts of the Do-Nothing scenario forms the baseline for comparison of the assessment of the other route options.

6.3 Common Route Alignment

6.3.1 The Common Route Alignment (CRA) is located on the north-west side of Banwell (shown in black on Figure 3). It connects the A371 to Wolvershill Road, passing through the Stonebridge Farm Caravan Park. A new junction would be located at Wolvershill Road. The total length of the CRA is 1.2km.

6.3.2 The provision of the CRA has been considered in isolation, with no highway link provided to the east of Wolvershill Road to bypass Banwell. The purpose of the CRA in isolation would be to provide connectivity to a potential housing development that may be identified in the emerging local plan. The assessment of the CRA will determine whether a full bypass link (i.e. continuing through from Wolvershill Road to the A368) provides additional value.

6.3.3 Whilst the final route of the CRA may deviate from that shown in Figure 3, the impacts & constraints of any differing route alignment is considered to be the same. As such, variations to the common route alignment have not been discussed within this report.

6.4 Route 1 – Northern Alignment

6.4.1 From Wolvershill Road, Route 1 takes a wide arc to the north of Banwell and Riverside heading east. It crosses Moor Road, Banwell River and Riverside Road and passes north of the solar farm that is located on the eastern side of Banwell. The alignment curves back south towards the A368, along the eastern edge of the solar farm, it reaches a proposed junction location to join up with the A368.

6.4.2 The total length of Route 1 is 4.1km (including the Common Route Alignment). It passes through a flood zone for 1.7km of its length. The route crosses 15 watercourses including Banwell River, rhynes and other manmade watercourses.

6.4.3 The alignment will require embankments through the flood zone which will increase the required land take. It is assumed that most watercourses will be contained in a culvert. One bridge structure would be required to cross the River Banwell.

6.5 Route 2 – Middle Alignment

6.5.1 From Wolvershill Road, Route 2 continues south east, passing to the north of the Riverside residential properties. The route crosses Moor Road, a historic landfill, the River Banwell and Riverside Road then continues through an orchard and Banwell Recreation Ground. The route continues in a generally south-easterly direction, to the west of the solar farm, to the location of the proposed junction joining with the A368.

6.5.2 The total length of Route 2 is 3.3km (including the Common Route Alignment). It passes through a flood zone for 1.0km of its length. It crosses a total of 13 watercourses including Banwell River, rhynes and other manmade watercourses.

6.5.3 The alignment would require embankments through the flood zone which would increase required land take. As per Route 1, it is assumed that most watercourses will be contained in a culvert. One bridge structure would be required to cross the River Banwell.

6.6 Route 3 – Southern Alignment

6.6.1 From Wolvershill Road, Route 3 continues south-southeast close to the boundary of the flood zone. It passes through the northern corner of a recently built housing development. It then passes adjacent to a Scheduled Monument (SM)[8] just south of Riverside and crosses over the River Banwell and Riverside Road. It continues east before joining into the proposed roundabout that connects with the A368.

6.6.2 The total length of Route 3 is 3.4km (including the Common Route Alignment). It passes through a flood zone for approximately 0.5km of its length. The route crosses 9 watercourses including Banwell River, rhynes and other manmade watercourses.

6.6.3 The alignment would require embankments through the flood zone which would increase required land take. It is assumed that most watercourses will be contained in a culvert. One bridge structure would be required to cross the River Banwell. A retaining structure is likely to be required to reduce the footprint of the Scheme at that location and minimise impact on the SM and recent residential development.

[8] The terms "Scheduled Monument (SM)" and "Scheduled Ancient Monument (SAM)" are often used interchangeably. The term "Scheduled Monument (SM)" has been used for the purposes of this report.

7 Layout Considerations

7.1 Overview

7.1.1 In order to ensure that the options presented are assessed equally, several design factors were analysed in greater detail, prior to the appraisal. This was to inform strategic design decisions at an early stage, which allows their incorporation within the design appraisal process. These considerations were:

a) Traffic Volumes;
b) Highway Cross-section;
c) Design speed / speed limit; and
d) Southern Link.

7.1.2 The following section outlines the determinations made that were applied to each alignment scenario.

7.2 Traffic

7.2.1 A North Somerset Strategic Traffic Model has been prepared which contains the design scenarios listed below. The traffic modelling has been provided to the project team for consideration during the Options Assessment.

a) 2018 – the model examines the performance of the existing highway network within the study area, prior to any changes being implemented;
b) 2021 – the model examines the performance of the highway network within the study area prior to the submission of a planning application / construction of housing;
c) 2026 – the model examines the performance of the highway network five years after planning and after the delivery of a northern bypass (includes committed development and infrastructure); and
d) 2038 – the model examines the performance of the highway network after construction of a northern bypass plus 3075 houses to look at cumulative impacts (includes committed development and infrastructure).

7.2.2 Based on the initial modelling undertaken, it is clear that providing a highway link to bypass the village of Banwell will reduce the amount of traffic on the A371 through Banwell. The highway link will alleviate the congestion issues that the narrow, single lane section of the A371 causes, and would facilitate the free flow of traffic through Banwell.

7.2.3 The bypass would also attract additional traffic from alternative routes as it becomes a more reliable east/west route across North Somerset, which could increase traffic through surrounding villages. This is illustrated in Figure 4.

7.2.4 The traffic modelling shows that, without a bypass, any future development east of Weston-super-Mare, would have a detrimental impact on traffic within Banwell.

7.2.5 Consideration of future housing developments that could be located in the area shows that a large proportion (more than half) of the traffic movements would be to and from key employment and business areas to the west (such as Weston-super-Mare).

7.2.6 As this scheme is funded by the Housing Infrastructure Fund, it has been assumed that there is no scenario where the housing would be delivered without the bypass. The bypass is fundamental for the delivery of the housing. Further traffic modelling will be undertaken during preliminary design, which will form the basis of the air quality considerations during the EIA.

7.2.7 It is important to note that further and more detailed traffic modelling remains ongoing and will inform the Environmental Statement during design development. The modelling will include testing of the developing design of the chosen bypass route, including the likely impacts on local and regional traffic.

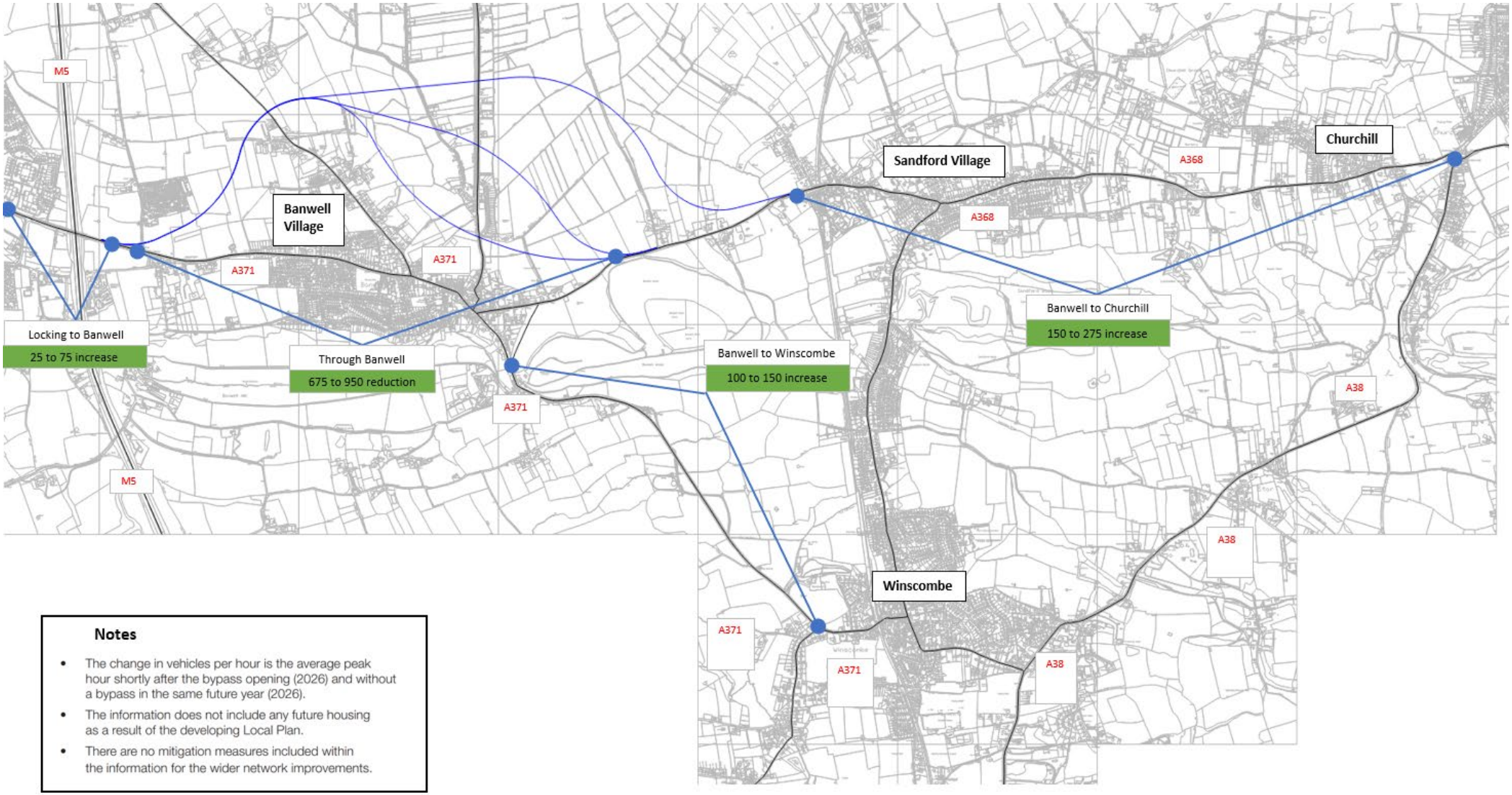

Figure 4: Traffic flow changes with and without the Banwell bypass (shortly after opening in 2026).

7.3 Cross-section

7.3.1 The following observations were made from the traffic model when considering the potential cross-section of the road:

a) Banwell Bypass is modelled as a dual carriageway within the existing model. The volume over capacity for the bypass within the traffic model is well below capacity during the peak hours on most sections of the bypass.[9]

b) If the model was amended from a dual carriageway to a single carriageway, traffic volumes on the bypass would reduce by 10% as a result of the capacity reduction. This suggests that 10% of the traffic was due to 'induced demand' as a direct result of the Scheme being in place.

c) Reducing the cross-section of the Scheme from a dual carriageway to a single carriageway halves the capacity of the road. This means that, during peak hours with a single carriageway bypass, traffic volumes on the road would be close to its capacity.

d) In the wider context of this Scheme within the surrounding highway network (single carriageway), and taking into account the Scheme objectives, increasing network capacity is not considered to be required as part of this Scheme.

7.3.2 Based on the above, a single carriageway bypass is proposed rather than a dual carriageway. This is for the following reasons:

a) The existing A371 and A368 corridors are single carriageway. A short section of dual carriageway around Banwell would be out of character with the rest of the routes; and

b) A single carriageway would require fewer construction materials, therefore reducing overall environmental impact and construction carbon emissions.

7.3.3 To facilitate NSC's aspirations and project objective of encouraging active travel opportunities, a shared use footway/cycleway has been provided on both sides of the proposed bypass for the options appraisal. The proposed cross-section is shown in Figure 5.

[9] Figures quoted for 2038 and includes the traffic generated from the strategic housing development.

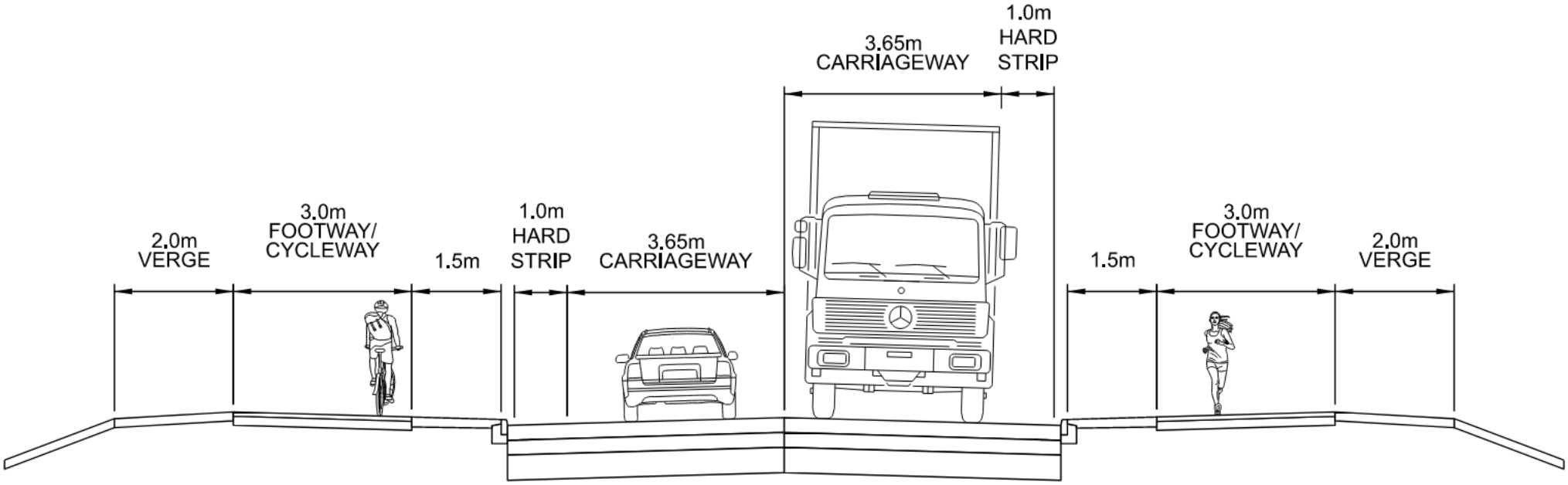

Figure 5: Highway cross-section

7.4 Speed limit

7.4.1 A design speed assessment[10] of the proposed highway alignment has been undertaken. The design speed assessment has been undertaken in line with the methodology outlined within CD109 – Highway link Design[11].

7.4.2 The derivation of design speed is based on two key constraints, which are:

a) Alignment constraint (Ac) – the degree of constraint imparted by the road alignment; and

b) Layout constraint (Lc) – the degree of constraint imparted by the road cross-section, verge width, and frequency of junctions and accesses.

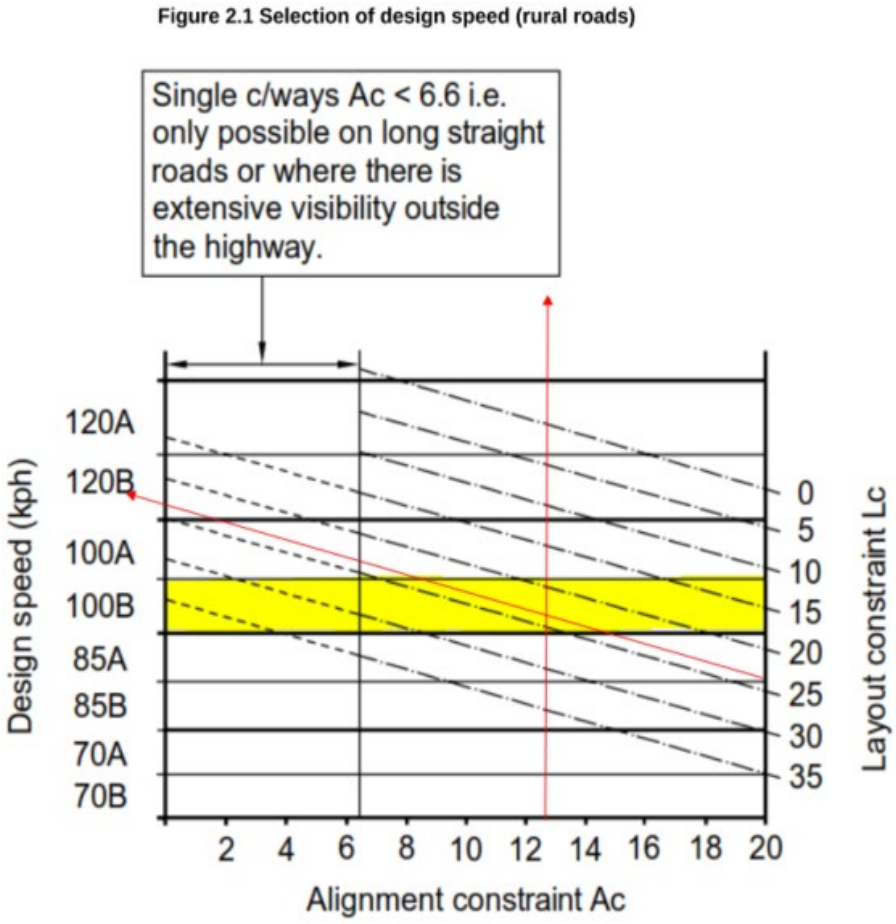

Figure 6: Derivation of Design Speed

[10] Alignment Option 2 was used for the purpose of the design speed assessment as it is the route alignment that is protected under the current Local Plan. Selection of any of the other route options alignments is not considered to fundamentally change the outcome of the assessment.
[11] DMRB – CD109 Highway link design

7.4.3 The outcome of the design speed assessment is outlined in Figure 6. This displays that the appropriate design speed from the CD109 assessment is 100kph. This design speed translates to 60mph.

7.4.4 As well as the technical design speed assessment, other factors have been considered in the derivation of the appropriate design speed. These are as follows:

a) **Design alignment and layout** – a lower speed limit allows the road alignment to be more flexible, minimising impact on the local environment;

b) **Active travel routes** – lower speed limits allow for safer, more attractive walking, cycling and horse-riding routes;

c) **Bypass junction locations** – the frequency of junctions along the bypass and surrounding roads may be unsuitable for higher speed limits;

d) **Context within the surrounding road network** – the surrounding highway network is largely 40mph or less. A 40mph speed limit would be in keeping with the rest of the local area;

e) **Journey time** - Higher speed limits do not decrease journey time, or reliability, with the greatest benefit being from bypassing Banwell; and

f) **Carbon emissions** – lower vehicle speeds in free flow conditions reduce vehicle emissions when compared to higher speeds.

7.4.5 A 40mph speed limit is considered to be the most reasonable speed limit for the Banwell bypass when considering all of the above.

7.4.6 The design speed assessment indicated that the design speed for the road is suitable for 60mph. The road layout and alignment can contribute to higher design speeds as wider road layouts would induce higher speeds. Non-compliance with the posted speed limit may result in a higher likelihood and severity of accidents along the link, as well as higher carbon emissions along the length of the bypass.

7.4.7 Measures could be undertaken in the design of the highway to increase the 'bendiness[12]' of the highway alignment or amend the proposed highway layout by reducing aspects of the cross-section. Measures

[12] Bendiness is measures as the total change of direction in horizontal alignment in degrees / km measures over a minimum length of 2km

could be taken to ensure that the bypass design is in keeping with the rest of the A371/A368 network to maintain compliance with the posted speed limit of 40mph.

7.5 Southern Link

7.5.1 The inclusion of the Southern Link as part of a northern bypass solution has been carefully considered. The Southern Link would be a single carriageway road, linking the A368 (East Street) to the A371 (Castle Hill). It would be subject to a 30mph speed restriction. A T-junction will provide a connection from the Southern Link back into Banwell. The Southern Link is common for all route options. The link will include measures to ensure its impact is lessened, this includes enforcing an appropriate speed limit for the link road. The Southern Link arrangement is shown in Figure 8.

7.5.2 Consideration has been given in the long list of options to the National Grid Haul Road as an alternative route to the Southern Link. This is outlined within section 5.9. For the reasons given in that section, this alternative route has been discounted.

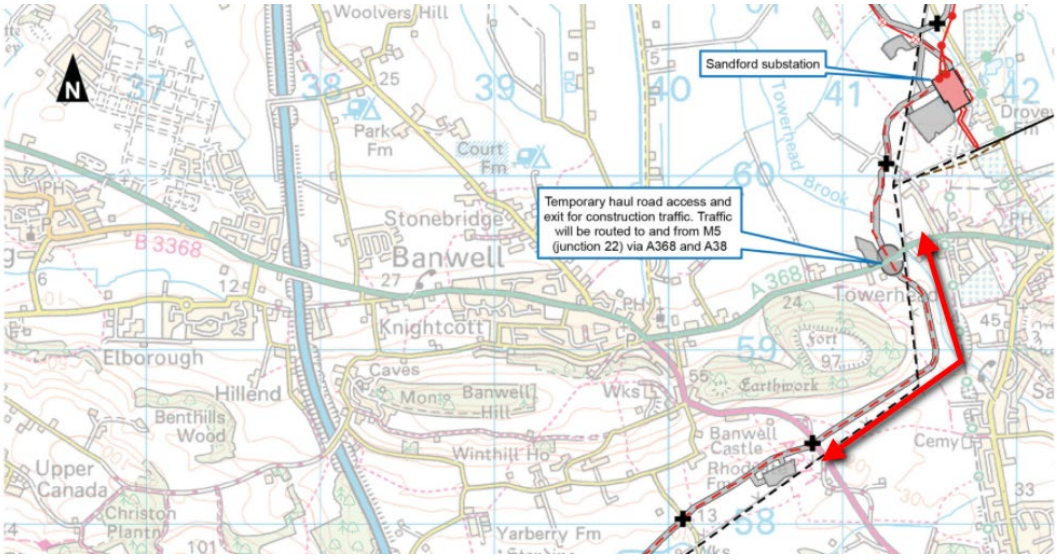

Figure 7: Portion of National Grid Haul Route proposed as an alternative is outlined by the red arrow. (© hinkleyconnection.co.uk)

7.5.3 The benefits of providing the Southern Link, delivered together with the Banwell bypass, would likely be:

a) A greater number of vehicles driving in both directions would use the new bypass instead of continuing to use the A371 through Banwell in order to travel towards Winscombe;

b) Vehicles travelling on routes from the Winscombe and Cheddar areas would be able to access the bypass without using the A368/A371 junction and the narrow sections of Castle Hill.

c) Lower levels of traffic along the A371 through Banwell would increase the opportunities for walking, cycling and horse-riding; and

d) Fewer vehicles would need to continue to use the A368/A371 junction and the narrow sections of Castle Hill, resulting in less congestion and air and noise pollution. Through traffic would be removed from Castle Hill and Dark Lane, which would have benefits for residents. (It is acknowledged that there would be some redistribution of noise impacts with properties along the eastern side of Dark Lane observing an increase in noise impacts as a result of the inclusion of the Southern Link).

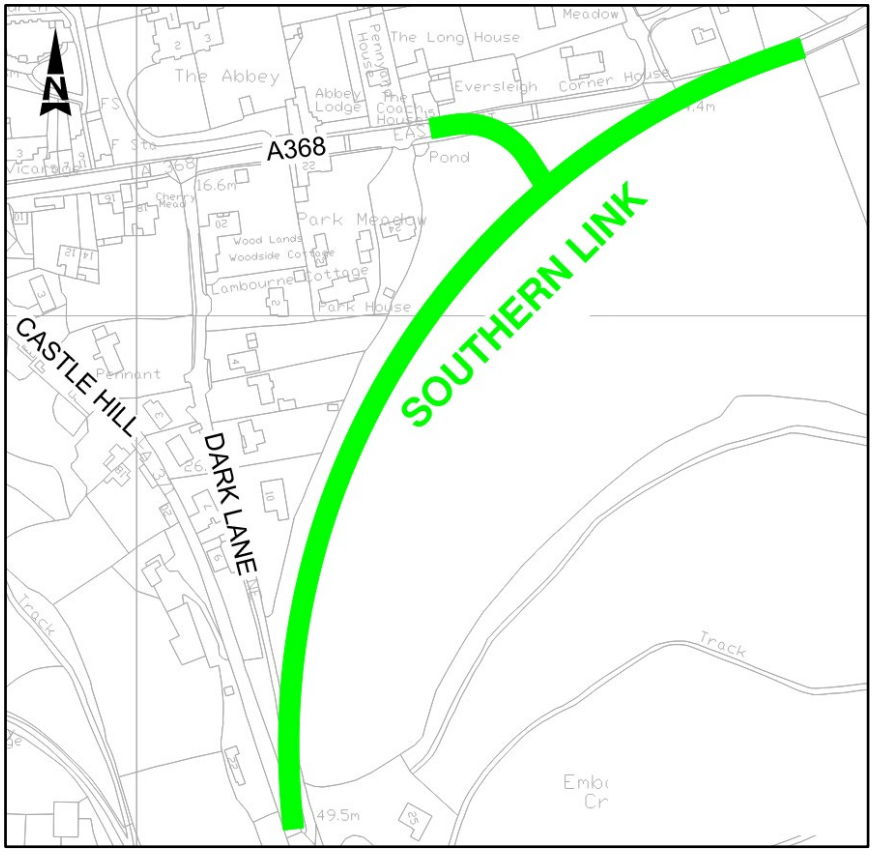

Figure 8: Southern Link location

7.5.4 Based on the points outlined within 7.5.3, a Southern Link is considered to be required as part of the overall Scheme. Whilst the rest of this report does not consider the Southern Link further, a WebTAG assessment has been undertaken of the Southern Link, with details included within Appendix F.

7.5.5 Mitigation measures to minimise adverse impacts on the following receptors/stakeholders will be carefully considered within the design development of the chosen route option.

a) The Mendip Hills AONB;

b) Residents of Dark Lane;

c) Underground aquifer Source Protection Zone (SPZ); and

d) Ecological habitats: North Somerset and Mendip Bats (SAC), Banwell Ochre Caves (SSSI), Banwell Caves (SSSI) and bat flight lines

8 Shortlisted Options – Appraisal

8.1.1 This section of the Options Assessment Report provides commentary on the detailed WebTAG appraisal of the shortlisted options (as listed in section 6). When reading this section, reference should be made to the Route Options Plan included in Appendix A.

8.1.2 The appraisal topics/criteria listed in the section below are as listed in Appendix D.

8.1.3 The assessment undertaken at this stage is a high-level preliminary assessment based on the available information. Further detailed modelling / surveys shall be undertaken during the design of the Scheme, which would be subject to an Environmental Impact Assessment (EIA). The conclusions reached as a result of the EIA may differ from the conclusions set out within this report due to the increased data available as a result of the modelling and surveys.

8.2 Social and Cultural

8.2.1 This section outlines the social and cultural assessment of all route options.

Table 3: Social and Cultural Assessment Summary Table

	Do-Nothing	CRA	Route 1 – Northern	Route 2 – Middle	Route 3 – Southern
Non-business Users	- - -	0	+++	+++	+++
Physical Activity	-	+	++	++	++
Journey Quality	- -	0	+++	+++	+++
Accidents	-	-	+	+	+
Security	-	-	0	0	0
Access to Services	- - -	- -	++	++	++
Affordability	0	0	0	0	0
Severance	-	0	++	++	0
Option Values	0	0	0	0	0

8.2.2 Impacts on both Affordability and Option Values have been assessed to have a negligible impact on all route options. As such, they are not discussed further in the following sections.

Do-Nothing

8.2.3 The Do-Nothing option has been assessed as having an overall adverse impact. The volume of traffic through Banwell is forecast to increase by around 12% compared to the current situation. This forecast growth will lead to longer delays, with some sections of the road operating above capacity. Journey times would increase by up to 7 minutes (59%) during peak periods. This is likely to result in a large adverse impact on non-business users.

8.2.4 There would be a moderate adverse impact on journey quality in the Do-Nothing scenario as traveller stress would likely increase due to increased traveller frustration. The likelihood of traffic accidents would also likely increase in the Do-Nothing scenario due to the forecast increase in traffic volumes through Banwell. The fear of potential accidents could also increase, especially for walkers and cyclists, which would increase security concerns.

8.2.5 The higher forecasted traffic increase would make walking and cycling to shops and other facilities within Banwell less appealing and more difficult, reducing active travel opportunities. Increased traffic through the village would adversely affect the quality of the environment for traveller journeys, especially for walking and cycling journeys made in Banwell village centre. There would be a slight adverse impact upon severance between the northern and southern sides of the village for pedestrians and cyclists. This is due to the likely increased traffic through Banwell which would make it more difficult for pedestrians and cyclists to cross the road. The likelihood of accidents involving walkers and cyclists would increase in the Do-Nothing scenario due to the increased potential of conflict with vehicles.

8.2.6 Accident analysis of accidents between 2015-2019 has shown that a cluster of accidents occurred on the A371 in Banwell around the West Street / East Street / Castle Hill / High Street crossroads. This section of the A371 has a particularly narrow section of carriageway suitable only for vehicles to travel in one direction at a time, with no footways for pedestrians.

Common Route Alignment (CRA)

8.2.7 The overall volume of traffic on Knightcott Road in Banwell (between Summer Lane and Wolvershill Road) is forecast to decrease by around 10% when compared to the Do-Nothing scenario due to traffic from Wolvershill Road using the CRA instead of Knightcott Road. Traffic volumes would increase at some locations on the A371 west of Banwell. The traffic volumes through Banwell village (east of Wolvershill Road) would increase, when compared to the Do-Nothing as a result of addition traffic from the HIF development travelling to and from the east.

8.2.8 Overall, journey times through the village are forecast to increase by up to 22% during peak periods due to:

a) Delays at the CRA junction for westbound traffic on the A371 Knightcott Road. This traffic would have to give way traffic using the CRA, joining the A371.

b) Additional traffic from the potential HIF development travelling east using the A371 via Wolvershill Road and the narrow sections at the eastern end of the A371 in Banwell.

8.2.9 Those using the CRA would not need to travel along Knightcott Road in Banwell (between Summer lane and Wolvershill Road) which currently suffers from delays, congestion, and poor journey time reliability during peak periods.

Northern Bypass Options

8.2.10 All three bypass options have been assessed as having a beneficial social and cultural impact.

8.2.11 For all three bypass alignments, the overall volume of traffic through Banwell is forecast to decrease by around 90% compared to the Do-Nothing scenario. This reduction in traffic would reduce delays and congestion through the village. As well as providing connectivity between any proposed housing development and the wider road network, the bypass solutions also offer a preferrable east-west route when compared to the A371 through Banwell. Journey times using the bypass would be up to 13 minutes (68%) quicker during peak periods than the Do-Nothing scenario route using the A371 through Banwell.

8.2.12 There would be a beneficial impact on non-business users because a bypass would directly contribute to improving the connectivity for non-

work journeys through reductions in delay, congestion and journey times and associated improvements to journey time reliability.

8.2.13 When compared to the Do-Nothing scenario, all three route alignment options have been assessed as having a large beneficial impact on non-business users. In reality, Route 1 has a slightly less beneficial impact than Routes 2 and 3. This is due to the distance between the eastern junction of the bypass and the start of the Southern Link section.

8.2.14 40-45% of all traffic using the bypass would go on to use the Southern Link, as this provides the main through route between Weston-super-Mare and Winscombe, Cheddar and beyond. With Route 1, the distance between the eastern junction and the Southern Link is greater, and as such vehicle journey times are slightly longer.

8.2.15 Whilst using the Route 1 alignment is still forecasted to be quicker when compared to travelling through Banwell, the indirect nature of this route may mean that some drivers do not use the bypass to undertake this movement, instead continuing to use the route through Banwell. This would result in a lesser decrease in the volume of traffic through Banwell.

8.2.16 Additionally, it is currently unclear whether Route 1 may redistribute traffic elsewhere along the highway network, and therefore cause issues elsewhere. The location of the eastern junction of Route 1 nearer to Sandford may mean that a greater proportion of traffic will use Sandford Road/Hill Road, as opposed to Castle Hill, to reach Winscombe. This may increase the volume of traffic along Sandford Road/Hill Road.

8.2.17 Conversely, whilst all three route alignment options have been assessed as having a large beneficial impact on active travel journeys, Route 1 may have a slightly greater beneficial impact than Routes 2 and 3. This is again due to the distance between the eastern junction of the bypass and the start of the Southern Link section.

8.2.18 The placement of the eastern junction to the east of Towerhead Farm would bypass a particularly constrained section of the network (between Eastermead Lane and Towerhead Farm) through which there may be challenges for the provision of a segregated cycleway/footway. The reduced volume of traffic that would travel along this section of road would at least make cycling more attractive, albeit with no segregated provision.

8.2.19 Route 3 has been assessed as having a greater adverse impact on severance than the other two route options. This is primarily due to two factors which are:

a) Severance of the community of Riverside from the rest of Banwell; and

b) Severance of Goding Lane, which has been identified in the walking, cycling and horse-riding assessment as a potentially key route for circular recreational horse-riding.

8.2.20 On balance, Route 2 is considered to offer the greatest social and cultural benefits when compared to the other route options, although it is acknowledged that the overall benefit is generally similar to Route 1. Route 2 would impact upon the recreation ground at Banwell Football Club, however there is potential mitigation options for this impact. Route 3 offers a slightly reduced beneficial impact due to the severance issues.

8.3 Environmental

Do-Nothing

8.3.1 Overall, the Do-Nothing option has been assessed as having a negligible overall impact on the Environment, with some slight adverse impacts for some assessment criteria. There would be a slight adverse effect on Noise due to the predicted increase in traffic. This would increase traffic noise exposure for a large number of properties within Banwell. There would be minimal change to Air Quality, whilst there would be in increase in traffic, there would also be an increase in the number of electric vehicles on the road reducing the emissions. would also be slight adverse impacts on the landscape and townscape. The historic core of the village will continue to be dominated by traffic in future years, limiting space available for improvements to the streetscape. Small new developments on the edge of the village would lead to gradual erosion of historic, remote, rural landscape character. Greenhouse gases would increase due to the forecasted increase in traffic volumes through Banwell (leading to increased congestion and reduced opportunity to implement active/sustainable travel infrastructure).

Table 4: Environmental Assessment Summary Table

	Do-Nothing	CRA	Route 1 – Northern	Route 2 – Middle	Route 3 – Southern
Noise	-	+	+++	++	+
Air Quality	0	0	++	++	+
Greenhouse Gases	- -	- -	- - -	- -	- -
Landscape	-	-	- -	- -	-
Townscape	-	-	++	+	-
Historic Environment	0	0	0	0	-
Biodiversity	0	0	- -	- - -	- - -
Water environment	0	-	- - -	- -	-
Flood risk	0	0	- - -	- -	-
Geology & Soils	0	- -	- -	- -	- -
Agricultural Land Severance	0	-	- - -	- -	-

Common Route Alignment

8.3.2 The CRA option has been assessed as having an overall negligible to slight adverse impact on the environment. There would be a slight improvement for noise, as the slight decrease in traffic in Banwell village centre would reduce noise exposure for a large number of properties within Banwell.

8.3.3 There are some Noise Important Areas in close proximity to the Scheme. These are primarily located on the western side of the Scheme and mostly due to existing traffic noise from the M5 motorway.

8.3.4 There would be negligible impact on air quality, historic environment, biodiversity, and flood risk.

8.3.5 There would be a slight adverse impact on landscape, townscape, the water environment, and agricultural land severance. The western junction will likely have a negative impact on residential receptors, with the presence of the road impeding views to the east and north. The historic core of the village will continue to be dominated by traffic in future years, limiting space available for improvements to the streetscape. A crossing would be required of Wallymead Rhyne necessitating the need for a new culvert. New road drainage outfalls would also be required, which could result in a slight adverse impact on the water environment. For agricultural holdings, movement between fields along public highways will be hampered by large volumes of slow-moving traffic, although there are no large commercial agricultural holdings affected by the CRA option that are heavily reliant on transportation links (such as dairy farms). Stonebridge Farm Caravan Park would be directly impacted by the alignment of the CRA.

Route 1 – Northern Route

8.3.6 The overall picture for the environmental assessment of Route 1 is mixed. There are generally moderate to large beneficial impacts on noise, air quality and townscape (although it is acknowledged that some properties may experience adverse noise and air quality impacts where the road is closer to them e.g. Summer Lane Park Homes). On the other hand, there are also moderate to large adverse impacts on other environmental issues, including greenhouse gas emissions, flooding & the water environment, and agricultural land severance. Details of the environmental assessment are outlined in Table 5.

8.3.7 The assessment indicates that there are large adverse effects on greenhouse gas emissions, water environment, flood risk and agricultural assessment. In reality, greater weight is placed on the adverse effects on greenhouse gases and flood risk.

8.3.8 Minimising greenhouse gases is a key Scheme objective. North Somerset declared a climate emergency in 2019 and aims to become carbon neutral by 2030. A Carbon Baseline Assessment has been undertaken which assesses the carbon impact of the three route alignment options. This considers both the User Carbon emissions (emissions from vehicles using the bypass) and Embodied Carbon emissions (carbon emissions from the construction of the routes). Further detail is provided within the Carbon Baseline Report[13] on greenhouse gas emissions.

8.3.9 In summary, User emissions are broadly the same for all route options. Due to the greater length of Route 1 when compared to the other route options, it has a greater impact on construction carbon emissions. As such, the overall impact of Route 1 on greenhouse gas emissions is greater than for the other two options. This goes against the project objective of reducing carbon impacts wherever possible.

8.3.10 Whilst innovative construction methods could be used to reduce the construction carbon emissions, these methods would be applicable to all three route options and therefore are not considered to improve the overall emissions relative to the other route options.

8.3.11 Route 1 has been assessed as having a moderate adverse impact on biodiversity. Route 1 has no direct impacts on designated sites, although there is an indirect impact on the North Somerset and Mendip Hills Bats SAC due to the proposed lighting around the roundabout at the eastern end. There would be a greater direct impact upon loss of ecological habitat due to the greater extent of the Scheme footprint.

8.3.12 The impact of Route 1 on the water environment and flood risk is assessed to be largely adverse. The adverse impact is greater than Route options 2 and 3. This is primarily due to the greater length of the route within a floodplain and the impact on a greater number of watercourses.

[13] BNWLBP-ARP-EGN-XXXX-RP-YC-000001 – Carbon Baseline Report

Route 2 – Middle Route

8.3.13 The overall picture for the environmental assessment of Route 2 is also mixed, however the adverse impacts are generally less than Route 1, with beneficial impacts for air quality, noise, and townscape (although it is acknowledged that some properties may experience adverse noise and air quality impacts where the road is closer to them e.g. Summer Lane Park Homes).

8.3.14 Reducing the impact on greenhouse gas emissions is a key project objective. In summary, emissions are lower for Route 2 when compared to Route 1 (Northern Route). This is primarily due to the decreased length of the scheme, and the subsequent reduction in capital (construction) carbon.

8.3.15 Route 2 has been assessed as having a large adverse effect on biodiversity. This is mainly due to the potential indirect impact of road lighting[14] and the location of the roundabout on the Banwell Ochre Caves Site of Specific Scientific Interest (SSSI) and the North Somerset & Mendip Bats Special Area of Conservation. The potential removal of road lighting from the Scheme is being assessed by the project team. If the lighting assessment concludes that the removal of road lighting from the scheme would not result in adverse safety implications, then this would mitigate the biodiversity impact of the route alignment on the SAC and SSSI. Whilst the removal of road lighting from the scheme would benefit all three route alignment options it would mean that Route 2 would have an indirect, rather than a direct, impact on the SAC and SSSI.

8.3.16 Achieving a 10% Biodiversity Net Gain (BNG) is a key project objective. Whilst the environmental assessment has concluded that Route 2 could have a large adverse impact on biodiversity, alignment Route 2 is considered to provide the greatest opportunity for BNG. This is due to the quantity and quality of the land surrounding the alignment which could be used to provide areas for BNG. Utilising these areas for BNG (e.g. the area between the proposed road and the edge of the village) could also provide landscape and townscape benefits by preventing development spill into these areas, which would retain the existing village character.

[14] The junction form / arrangement for the eastern junction will likely be a roundabout (based on predicted traffic flows). Road lighting is typically provided on roundabouts, however this is not a requirement under the Design Manual for Roads & Bridges (DMRB)

8.3.17 The impact of Route 2 on the water environment and flood risk is assessed to be moderate adverse. The adverse impact is less than Route 1 but greater than Route 3. This is primarily due to the reduced length of the route through the flood plain when compared to Route Option 1.

Route 3 – Southern Route

8.3.18 Route 3 generally has adverse environmental effects on the environment, ranging from slight adverse to large adverse. There are slight benefits on air quality and noise, however the number of properties subject to new, adverse impacts on both air quality and noise would be much greater than the other two bypass alignment options.

8.3.19 The impact on greenhouse gases is moderate adverse. Whilst the construction carbon emissions are lower for Route 3 than for the other two routes, the overall emissions is equal when user carbon is considered.

8.3.20 Route 3 would have similar impacts on biodiversity as Route 2 and has been assessed to have a large adverse impact. Whilst the mitigation measures outlined for Route 2 could be utilised on Route 3, Route 3 is considered to provide less opportunity to provide BNG when compared to the other two route options. This is due to the reduced availability of land to provide additional BNG habitat. The provision of 10% BNG is a key project objective.

8.3.21 The flood risk of Route 3 is lower due to the reduced length within the floodplain. The reduced length of route within the floodplain is a contributing factor to the lower greenhouse gas emissions of this route, as the route requires the construction of fewer band drains over the flood plain.

8.3.22 The alignment for Route 3 is much closer to the village of Banwell and has a direct impact on Banwell Conservation Area as well as a Scheduled Monument. It also has a direct impact on areas of known archaeology, which contributes to an overall adverse impact on landscape, townscape, and historical environment.

Table 5: Detailed Environmental Assessment Summary Table of the three bypass options

Assessment Area	Route 1 – Northern Alignment		Route 2 – Middle Alignment		Route 3 – Southern Alignment	
Noise	+++	Traffic would be relieved through the more densely populated part of Banwell, reducing traffic noise exposure for a large number of properties. Route 1 would bring traffic closer to Summer Lane Caravan Park and some properties at Stonebridge. Properties along the north side of Stonebridge would be subject to slightly higher noise levels than from current traffic on the A371 through Banwell. The Scheme would reorientate the dominant traffic noise direction at properties on Riverside as traffic would now travel to the north of these properties rather than to the south. This would not cause any change in noise exposure level. Overall, the number of properties benefitting would far outweigh the adverse impacts on a small number of properties.	++	Traffic would be relieved through the more densely populated part of Banwell, reducing traffic noise exposure for a large number of properties. Route 2 would bring traffic closer to Summer Lane Caravan Park and some properties at Stonebridge. Properties along the north side of Stonebridge would be subject to slightly higher noise levels than from current traffic on the A371 through Banwell. The Scheme would align closer to the north of properties on Riverside than Route 1 and also reorientate the dominant traffic noise direction to the rear (relative to the existing A371). This would likely increase traffic noise at these properties. Overall, the number of properties benefitting from reduced noise would far outweigh the adverse impacts on a small number of properties.	+	Traffic would be relieved through the more densely populated part of Banwell reducing traffic noise exposure for a large number of properties. Route 3 would bring traffic closer to Summer Lane Caravan Park and some properties at Stonebridge. This option would bring the alignment closer to properties on the north side of Stonebridge and properties further south on Wolvershill Rd and Riverside. The alignment would be much closer to the northern side of Banwell (towards its eastern end) relative to the other route alignment options. Overall, the number of properties benefitting would still outweigh the number of properties subject to adverse impacts, although the number of properties subject to new, adverse impacts would be much greater than the other two bypass alignment options.
Air Quality	++	The Scheme moves the majority of traffic away from the main urban area of Banwell (and associated receptors) and therefore there would be a benefit to air quality. It is however noted that Banwell is not within an air quality management area and therefore it is not considered to currently suffer from air quality issues. Overall, it is considered there would be a moderate beneficial impact to air quality.	++	The Scheme moves the majority of traffic away from the main urban area of Banwell (and associated receptors) and therefore there would be a benefit to air quality. The Scheme is closer to existing properties than Route 1, however the impacts on these properties would be negligible. It is noted that Banwell is not within an air quality management area and therefore it is not considered to currently suffer from air quality issues. Overall, it is considered there would be a moderate beneficial impact to air quality.	+	The Scheme moves the majority of traffic away from the main urban area of Banwell (and associated receptors) and therefore there would be a benefit to air quality. The Scheme is closer to existing properties than Routes 1 and 2, with some areas very close to existing housing developments. It is noted that Banwell is not within an air quality management area and therefore it is not considered to currently suffer from air quality issues. Overall, it is considered that there would be a slight beneficial impact to air quality, although the number of properties subject to new, adverse impacts would be much greater than the other two bypass alignment options.
Greenhouse Gas Emissions	- - -	This Option is the longest route length and crosses over a greater area of the floodplain which requires the road to be built upon embankment to protect it from flooding. The soft soils in the floodplain will require additional material to surcharge the embankments in order to improve the ground. For all Options the User Carbon is very similar due to the similarity in the route vertical and horizontal alignments. However, due to the greater Scheme length, this option has the greatest User Carbon Impact and therefore along with the greatest Embodied Carbon it is the least favourable option with respect to Carbon Impact.	- -	Whilst this option is marginally shorter than Option 3 it has a slightly greater Embodied Carbon impact due to the longer length of embankment over the floodplain and resulting ground treatment for soft soils. However, the User Carbon for future year (2038) is marginally less than Options 1 and 3. Therefore, as this is the biggest contributor of Carbon this Option would be considered the best with respect to Carbon Impact.	- -	Whilst this Option is slightly longer than Option 2 and requires a retaining structure to support the highway adjacent to the SM and recent residential development, it has the shortest length over the floodplain and therefore the Embodied Carbon Impact is slightly less than Option 2. However, the User Carbon, which has a greater overall impact, is slightly greater than Option 2 and slightly less than Option 1.

Assessment Area	Route 1 – Northern Alignment		Route 2 – Middle Alignment		Route 3 – Southern Alignment	
Landscape	- -	This option introduces a new urban element across the entire viewshed, both from Banwell and Mendip AONB. The panoramic views across Somerset Levels, Moors and Coast is considered a special quality of the AONB. Views to the hills from small settlements and PRoW on the moors would also be affected. Highways infrastructure such as lighting, signage, kerbs & road markings are out of keeping with rural character. Views to neighbouring village church spires, and medieval field patterns, would be interrupted. The raised section through Locking and Banwell Moors character area would be out of keeping with the flat, open character. This option would introduce additional noise and traffic movement to a previously tranquil, remote countryside location. The option directly impacts Stonebridge Farm campsite. Opportunities for grassland, woodland, hedgerow screening, and habitat enhancement within the Scheme area could mitigate impacts and have a positive influence on the landscape character.	- -	This option introduces a new urban element across the entire viewshed, both from Banwell and Mendip AONB. Views to the hills from small settlements and ProW on the moors would also be affected. Highways infrastructure such as lighting, signage, kerbs & road markings are out of keeping with rural character. Views to neighbouring village church spires, and medieval field patterns, would be interrupted. The raised section through Locking and Banwell Moors character area would be out of keeping with the flat, open character. This option would introduce additional noise and traffic movement to a previously tranquil, remote countryside location. The proposed crossing location at Riverside directly impacts a traditional orchard, pond, and Banwell recreation ground, leading to loss of biodiversity, amenity, and cultural heritage. The option directly impacts Stonebridge Farm campsite. The proposed junction / additional road infrastructure along Towerhead Road would have a negative impact on dark skies, tranquillity, and ancient woodland special qualities of the AONB. Opportunities for grassland, woodland, hedgerow screening, and habitat enhancement within the Scheme area could mitigate impacts and have a positive influence on the landscape character.	-	This option's proximity to Banwell causes a hard urban edge, with lighting, signage, and associated highway infrastructure out of keeping with the tranquil rural environment. This option would isolate pastureland adjacent to the village from the wider countryside. The option directly impacts Stonebridge Farm campsite. The proposed junction / additional road infrastructure along Towerhead Road would have a negative impact on dark skies, tranquillity, and ancient woodland special qualities of the AONB. Opportunities for grassland, woodland, hedgerow screening, and habitat enhancement within the Scheme area could mitigate impacts and have a positive influence on the landscape character.
Townscape	++	The reduction in traffic through Banwell would improve the townscape within the village as well as providing opportunities for enhancements to streetscape. The Scheme is at a distance from the core area of Banwell, but is in proximity to smaller populations in outlying residential areas; Park Homes, Riverside, Towerhead Farm, etc.	+	The reduction in traffic through Banwell would improve the townscape within the village as well as providing opportunities for enhancements to streetscape. The route option is closer to the northern and eastern fringes of Banwell and bisects the linear settlement on Riverside.	-	The route passes through the designated Banwell Conservation Area - near the Scheduled Monument. Disturbance from the road including noise, movement, and lighting is likely to have a detrimental impact on residential properties and open space amenity. The route option severs the settlement of Riverside from the rest of the village. The reduction in traffic through Banwell would improve the townscape within the village as well as providing opportunities for enhancements to streetscape.
Historic Environment	0	There is potential for buried archaeology, especially at the wetland/dryland interface and along paleochannels. There is potential for dewatering of buried archaeology. Given the length of the Scheme the impact is likely to be moderate negative. This is offset by the moderate positive impact on people, placemaking and the lived experience through the historic core of Banwell due to the removal of through traffic.	0	There is potential for buried archaeology, especially at the wetland/dryland interface and along paleochannels. There is potential for dewatering of buried archaeology. Given the length of the Scheme the impact is likely to be moderate negative, although it is acknowledged that this route is slightly shorter than Route 1. This is offset by the moderate positive impact on people, placemaking and the lived experience through the historic core of Banwell due to the removal of through traffic.	-	The potential for buried archaeology is high given the known excavations in the vicinity of the route. There is a direct impact on the designated Banwell Conservation Area. The archaeology is likely to be typical of the area and therefore research gain is limited. The beneficial impact associated with the reduction of traffic through Banwell historic core is less than for the other options due to the proximity of the Scheme to the village and the impact of noise and air quality on the Scheduled Monument.

Assessment Area	Route 1 – Northern Alignment		Route 2 – Middle Alignment		Route 3 – Southern Alignment	
Biodiversity	- -	There is no direct impact on designated sites (i.e., no construction directly within the SAC), although here is an indirect impact on the North Somerset and Mendip Hills Bats SAC due to the proposed lighting around the roundabout at the eastern end. There would be a loss of ecological habitat such as wetland, rhynes and water courses, hedgerows, trees and woodland, and grasslands. Impact on species would include demolition of outbuildings with some bat roost potential; impact on bat roosts, dormouse, badger, reptiles, GCN and amphibians, otter, water vole, bird species including Schedule 1 species, invertebrates and aquatic macrophytes. There would be an indirect impact on Tower Head ancient woodland.	- - -	There is potential for direct impact on North Somerset and Mendip Hills Bats SAC, and a Site of Specific Scientific Interest, due to the lighting around the roundabout at the eastern end. There would be a loss of ecological habitat such as wetland, rhynes and water courses; pond and grasslands near to football pitches; hedgerows, The loss of ecological habitat would be slightly greater than Route 1. There would be a direct impact on a traditional orchard. Impact on species would include demolition of outbuildings with some bat roost potential; impact on bat roosts, dormouse, badger, reptiles, GCN and amphibians, otter, water vole, bird species including Schedule 1 species, invertebrates and aquatic macrophytes. There would be some severance of bat flight routes. The proposed alignment would pass between bat roosts (located within the SAC) and bat feeding grounds (located north of the SAC on the lower lying floodplains). There would be an indirect impact on Tower Head ancient woodland.	- - -	There is potential for direct impact on North Somerset and Mendip Hills Bats SAC, and a Site of Specific Scientific Interest, due to the lighting around the roundabout at the eastern end. There would be a loss of ecological habitat such as wetland, rhynes and water courses; pond and grasslands near to football pitches; hedgerows, The loss of ecological habitat would be slightly greater than Route 1. Impact on species would include demolition of outbuildings with some bat roost potential; impact on bat roosts, dormouse, badger, reptiles, GCN and amphibians, otter, water vole, bird species including Schedule 1 species, invertebrates and aquatic macrophytes. There would be some severance of bat flight routes. The proposed alignment would pass between bat roosts (located within the SAC) and bat feeding grounds (located north of the SAC on the lower lying floodplains). There would be an indirect impact on Tower Head ancient woodland.
Water Environment	- - -	This option crosses the largest number of watercourses / rhynes and as such has the most potential for adverse impacts as a result of new culverts/outfalls. There is potential for new culverts and outfalls to alter physical structure and disconnect sections of the watercourses.	- -	This option crosses a number of watercourses / rhynes, although not as many as Route 1. There is potential for new culverts and outfalls to alter physical structure and disconnect sections of the watercourses.	-	This option crosses fewer watercourses / rhynes than Routes 1 or 2. However, the requirement for new culverts and outfalls remains, which may alter physical structure and disconnect sections of watercourse.
Flood Risk	- - -	Route 1 has the greatest length of road within the floodplain (1.7km), as well as the number of watercourses and rhyne crossings. As such, this option has the largest adverse impact on flood risk.	- -	Route 2 has a 1km length of road within the floodplain, as well as a number of watercourses and rhyne crossings (although not as many crossings as Route 1). As such, this option is judged to have a moderate adverse effect on flood risk.	-	Route 3 has a 0.5km length of road within the floodplain, as well as a lower number of watercourses and rhyne crossings, when compared to the other bypass alignment options. As such, this option is judged to have a slight adverse effect on flood risk.

Assessment Area	Route 1 – Northern Alignment		Route 2 – Middle Alignment		Route 3 – Southern Alignment	
Geology & Soils	- -	A review of provisional Agricultural Land Classification (ALC) on DEFRA MAGIC database has identified that the construction of the Scheme would primarily affect ALC grade 3 land , and also limited areas of ALC grade 4 land. ALC grade 3 land is divided into two subgrades designated 3a and 3b. Best and most versatile (BMV) agricultural land includes ALC grades 1 to 3a. For the purpose of this assessment, it has therefore been assumed that this area is ALC grade 3a. Grade 3a (BMV) land is a high-value receptor, in addition to ALC grade 3b and ALC grade 4 land which are medium- and low-value receptors respectively. There may also be some impacts on land not used for agriculture or urban / developed areas which have a negligible sensitivity value. The construction of the mainline carriageway would require the permanent acquisition of BMV agricultural land ALC grade 3a . This would lead to a moderate magnitude of impact on that land given the permanent sealing of the soil resource. Given the permanent nature of the effect, the loss of BMV land cannot be mitigated and this therefore leads to an overall permanent adverse effect on the soil resource.	- -	A review of provisional Agricultural Land Classification (ALC) on DEFRA MAGIC database identified that the construction of the Scheme would primarily affect ALC grade 3 land , and also limited areas of ALC grade 1 and 4 land. ALC grade 3 land is divided into two subgrades designated 3a and 3b. Best and most versatile (BMV) agricultural land includes ALC grades 1 to 3a. For the purpose of this assessment, it has therefore been assumed that this area is ALC grade 3a. Grade 3a (BMV) land is a high-value receptor, in addition to ALC grade 3b and ALC grade 4 land which are medium- and low-value receptors respectively. Grade 1 (BMV) is a very high-value receptor. There may also be some impacts on land not used for agriculture or urban / developed areas which have a negligible sensitivity value. The construction of the mainline carriageway would require the permanent acquisition of BMV agricultural land ALC grade 3a and limited areas of ALC grade 1. This would lead to a moderate magnitude of impact on that land given the permanent sealing of the soil resource. Given the permanent nature of the effect, the loss of BMV land cannot be mitigated and this therefore leads to an overall permanent adverse effect on the soil resource. GEOLOGY: Construction works may slightly encroach on Banwell Ochre Caves SSSI/North Somerset & Mendip Bats SAC (high-value receptor) area. Considering the nature of the designated area i.e. cave system , the Scheme is unlikely to have a permanent impact on this receptor, resulting in negligible effect. LAND CONTAMINATION: The Scheme would directly impact on a historical landfill site, which may result in impact on construction workers (temporary), contamination of controlled water receptors (temporary and permanent), and impact on the geotechnical design of the scheme (e.g. settlement). Best practice during construction with respect to health and safety and pollution control, as well as appropriate Scheme design, would be sufficient to minimise the impacts, resulting in negligible effects.	- -	A review of provisional Agricultural Land Classification (ALC) on DEFRA MAGIC database identified that the construction of the Scheme would primarily affect ALC grade 3 land , and also limited areas of ALC grade 1 and 4 land. ALC grade 3 land is divided into two subgrades designated 3a and 3b. Best and most versatile (BMV) agricultural land includes ALC grades 1 to 3a. For the purpose of this assessment, it has therefore been assumed that this area is ALC grade 3a. Grade 3a (BMV) land is a high-value receptor, in addition to ALC grade 3b and ALC grade 4 land which are medium- and low-value receptors respectively. Grade 1 (BMV) is a very high-value receptor. There may also be some impacts on land not used for agriculture or urban / developed areas which have a negligible sensitivity value. The construction of the mainline carriageway would require the permanent acquisition of BMV agricultural land ALC grade 3a and limited areas of ALC grade 1. This would lead to a moderate magnitude of impact on that land given the permanent sealing of the soil resource. Given the permanent nature of the effect, the loss of BMV land cannot be mitigated and this therefore leads to an overall permanent adverse effect on the soil resource. GEOLOGY: Construction works may slightly encroach on Banwell Ochre Caves SSSI/North Somerset & Mendip Bats SAC (high-value receptor) area. Considering the nature of the designated area i.e. cave system , the Scheme is unlikely to have a permanent impact on this receptor, resulting in an negligible effect. Option 3 would largely avoid soft ground associated with the floodplain. Whilst this would benefit scheme construction, it would not affect the impact of the scheme on the local environment.
Agricultural Severance	- - -	Alignment 1 (beyond the CRA common section) will be likely to impact the most agricultural holdings (approximately 12). A number of equestrian grazing units, or small holdings (off Church Street and Moor Road) would likely be affected. Larger agricultural holdings are located at the eastern end of the Scheme. Impacts would arise from land loss, severance, possible demolition of buildings, disruption to field water supplies and field drainage, and possible diminution in value.	- -	Alignment 2 (beyond the CRA common section) will be likely to impact approximately 11 agricultural holdings. A fewer number of equestrian grazing units, or small holdings, would be affected when compared to Route 1. Larger agricultural holdings are to be found to the east albeit the quality of agricultural management – evidenced by the preponderance of weed growth - appears low. Impacts would arise from land loss, severance, possible demolition of buildings, disruption to field water supplies and field drainage, and possible diminution in value.	-	Alignment 3 (beyond the CRA common section) will be likely to impact approximately 9 agricultural holdings. Impacts would arise from land loss, severance, possible demolition of buildings, disruption to field water supplies and field drainage, and possible diminution in value.

8.4 Economic

Do-Nothing

8.4.1 The Do-Nothing option has been assessed as having an adverse effect on both journey times and journey reliability, resulting in an adverse economic impact. This is largely due to the impact of future traffic growth[15]. Due to the predicted future traffic growth through Banwell, some sections of the A371 & A368 would experience increases in delay and congestion, with journey times increasing by up to 7 minutes (59%) during peak periods. This is likely to result in a large adverse impact on non-business users, business users and transport providers because journey times and connectivity for freight, business and commuting and other journeys are expected to worsen with forecast traffic increases. It would also result in a moderate adverse effect on journey reliability which would worsen for all journey types. The higher forecasted traffic increase would make walking and cycling to locations of employment, shops, and other facilities within Banwell less appealing and more difficult, reducing active travel opportunities.

Common Route Alignment

8.4.2 The CRA has been assessed as having a negligible effect on both journey times and journey reliability, resulting in a negligible economic impact. The overall volume of traffic on Knightcott Road in Banwell (between Summer Lane and Wolvershill Road) is forecast to decrease by around 10% when compared to the Do-Nothing scenario due to traffic from Wolvershill Road using the CRA instead of Knightcott Road. Traffic volumes would increase at some locations on the A371 west of Banwell. The traffic volumes through Banwell village (east of Wolvershill Road) would increase, when compared to the Do-Nothing as a result of addition traffic from the HIF development travelling to and from the east.

8.4.3 This should lead to reductions in delay and congestion at some existing junctions however overall, journey times through the village are forecast to increase by up to 22% during peak periods due to:

[15] Traffic modelling has been undertaken to assess the predicted traffic impact. All figures quoted are for the "design year", which is 2038. Traffic increases or decreases are in comparison to the "base year" of 2018. Journey times are assessed based on users travelling from the M5 overbridge (west of Banwell) to the western edge of Sandford.

a) Delays at the CRA junction for westbound traffic on the A371 Knightcott Road. This traffic would have to give way traffic using the CRA, joining the A371.

b) Additional traffic from the potential HIF development travelling east using the A371 via Wolvershill Road and the narrow sections at the eastern end of the A371 in Banwell.

8.4.4 Those using the CRA, predicted to be predominantly commuting trips between HIF housing development and Weston-super-Mare, would no longer need to travel along Knightcott Road in Banwell (between Wolvershill road and Summer lane), which currently suffers from delays, congestion, and poor journey time reliability during peak periods.

8.4.5 On balance there would be a neutral impact on non-business users, business users and transport providers because journey times, costs and connectivity for freight, business, commuting and other journeys would improve for some routes but not others.

Northern Bypass Routes

8.4.6 All three bypass options have been assessed as having a beneficial impact on both journey times and journey reliability, resulting in a beneficial economic impact. The differences in the economic assessment of user benefits between the three bypass options are negligible.

8.4.7 For all three bypass alignments, the overall volume of traffic through Banwell is forecast to decrease by around 90% compared to the Do-Nothing scenario. This reduction in traffic would reduce delays and congestion through the village. As well as providing connectivity between the proposed housing development and the wider road network, the bypass solutions also offer a preferrable east-west route when compared to the A371 through Banwell. Journey times using the bypass would be up to 13 minutes (68%) quicker during peak periods than the Do-Nothing scenario route using the A371 through Banwell.

8.4.8 There would be a beneficial impact on non-business users, business users and transport providers due to journey time benefits, and connectivity for freight, business and commuting and other journeys would improve as a result.

8.4.9 The reduction in traffic through Banwell would result in walking and cycling benefits, as connectivity and journey reliability to locations of employment, shops and other facilities would be improved.

Summary – Economic elements of Options Appraisal

8.4.10 Due to the forecast increase in journey times and forecast decrease in journey reliability, there would be an adverse economic impact in the future if nothing was done to alleviate the congestion issues within Banwell.

8.4.11 The economic assessment shows clear benefits for providing a bypass solution for the village of Banwell. The differences between the bypass options in terms of user benefits are negligible. The CRA has a neutral economic impact. A summary of the economic assessment is shown in Table 6.

Table 6: Economic Assessment Summary Table

	Do-Nothing	CRA	Route 1 – Northern	Route 2 – Middle	Route 3 – Southern
Non-Business Users	- - -	0	+++	+++	+++
Business Users and transport providers	- - -	0	+++	+++	+++
Reliability	- -	0	++	++	++
Wider Impacts	0	0	0	0	0

8.5 Comparative Scheme Costs

8.5.1 A detailed cost assessment has not been undertaken for this Options Appraisal. However, commentary is provided within this section on the comparative Scheme costs and impact on the Benefit Cost Ratio (BCR).

8.5.2 Cost estimates have previously been produced[16] for the three route options. These are based on cost estimates for similar schemes and a cost per kilometre of highway. The cost estimate also considered each junction & structure in isolation.

[16] (WSP, July 2018)

8.5.3 The information required to accurately estimate the cost for each option is currently limited. As such, allowances were made to reflect the likely increased complexity of elements such as ground remediation, drainage attenuation, environmental mitigation etc. for each alignment.

8.5.4 The broad costs of each alignment option is outlined in Table 7. From a high-level review of the comparative cost estimates, the comparative costs previously produced are still reflective of the likely costs of each alignment option.

8.5.5 The costs outlined in Table 7 indicate that of the three route alignment options, Route 1 (northern alignment) is the most expensive, and Route 3 (southern alignment) is the least expensive.

Table 7: Summary of Alignment Route Costs

	Do-Nothing	CRA	Route 1 – Northern	Route 2 – Middle	Route 3 – Southern
Total Cost	0	£14m-£20m	£55m-£65m	£47m-£57m	£40m-£50m

8.5.6 The Do-Nothing scenario would cost nothing, however as outlined in section 8.4.1, this option would result in an adverse economic impact in the longer term. The Do-Minimum scenario would cost less than the bypass options (£17m), however would not result in any beneficial economic impact in the longer term. All three bypass options are assessed to result in a moderate to large beneficial economic impact in the longer term.

8.6 Indicative Economic Assessment

8.6.1 A detailed economic appraisal has not been undertaken for this Options Appraisal. However, commentary is provided within this section on the potential impact on the Benefit Cost Ratio (BCR) of each option.

8.6.2 The main purpose of an economic assessment is to provide a measure of the value for money of a transport proposal. The economic appraisal of transport Schemes is typically a quantitative assessment and as such is focussed on, but not limited to, impacts on the economic efficiency of the transport sector. The specific impacts considered within a monetised assessment are listed in Table 8.

Table 8: Impacts on Economic Efficiency of the Transport Sector

Economic Appraisal Topic	Commentary
User Benefits - Consumers	Benefits are applied to a specific set of impacts as follows: • Journey time savings • Vehicle operating cost savings • User charges (e.g. tolls) • Additional costs due to construction/maintenance disruption
User Benefits – Business	Benefits are applied to a specific set of impacts as follows: • Journey time savings • Vehicle operating cost savings • User charges (e.g. tolls) • Additional costs due to construction/maintenance disruption
Accident Benefits	Monetised impacts are calculated based on the average costs of accidents by severity and road class. In addition to casualty costs, the total costs of accident include components associated with damage to property, insurance administration, police time, and allowance for damage-only incidents.
Greenhouse Gas Impacts	Greenhouse gas emissions were monetised in accordance with WebTAG, employing the Greenhouse Gases Workbook to provide monetised estimated of the impacts of changes in emissions.
Air Quality Impacts	The assessment of air quality impacts employs the methodology set out in WebTAG and the Air Quality Valuation Workbook
Noise Impacts	WebTAG provides a framework for monetising the benefits of reducing noise exposure to traffic for households.
Indirect Tax Revenues	Captures indirect tax revenues to Central Government through, for example, changes in fuel duty that result from the Scheme.

8.6.3 User benefits, for both consumers and businesses, are dominated by travel time savings (with a small proportion relating to vehicle operating costs). All three bypass solutions offer travel time savings when compared to the Do-Nothing and the CRA scenarios.

8.6.4 Route 1 would increase travel times for journeys made from Weston-super-Mare to Winscombe (and further south) when compared to Routes 2 and 3. This is due to the location of the eastern junction, which is further to the east, and as such journey times between the eastern junction and the start of the southern link would be longer than the other two options. The difference between Routes 2 and 3 is considered to be negligible. Route 1 would still provide journey time savings when compared to the Do-Nothing and the CRA scenarios.

8.6.5 All three bypass solutions would offer similar highway link and junction characteristics, and similar traffic volumes. As such, variations

in the economic assessment of each option due to accident benefits are considered to be negligible. Based on the monetised impacts for accident savings, it is assumed that the monetised accident benefits would be positive when compared to the Do-Nothing and CRA scenarios.

8.6.6 The Scheme would generate an increase in emissions due to an increase in traffic speeds, as well as a small increase in the distance that through traffic has to travel as a result of any of the bypass options.[17] This would result in a negative value for the monetised value of greenhouse gas emissions. It is assumed that the costs associated with the greenhouse gas emissions would be smallest for Route 2 when compared to the other bypass options due to the total distance travelled.

8.6.7 It is anticipated that the provision of a bypass solution would reduce road traffic derived pollutant emissions at receptors within Banwell, especially those in the immediate vicinity of the A371 and A368. Route 1 may have a slightly more positive noise impact than the other two options, however the overall effect of this is considered to be negligible in the overall economic assessment.

8.6.8 It is anticipated that the provision of a bypass solution would result in a positive overall effect for noise impacts as the bypass would reduce noise exposure to the vast majority of properties within Banwell. Route 1 may have a slightly more positive noise impact than the other two options, however the overall effect of this is considered to be negligible in the overall economic assessment.

8.6.9 Any variance in indirect tax revenues between the three route options is considered to be negligible.

8.6.10 Whilst there may be some variation in the economic appraisal of the three bypass solutions - as outlined above – the difference between the Present Value Benefits (PVB) for the three proposed bypass solutions would be negligible on the whole. As such, the Present Value of Costs (PVC) outlined within Table 7 could have an impact on the overall BCR for each option. It is anticipated that the BCR for Route 3 may be the highest of the three route alignment options due to it having the lowest construction cost. On the same basis, the BCR for Route 1 may be the

[17] The economic appraisal considers only user greenhouse gas emissions and does not include any greenhouse gas emissions during the construction phase or operational greenhouse gas emissions, which includes the impacts of maintenance and street lighting.

lowest.

8.6.11 It is not possible to quantify the overall economic impact due to the absence of data at this stage. Regardless of the BCR for each individual bypass alignment, any proposed bypass solution also needs to be viewed within the context of the overall potential housing strategic development.

8.6.12 There may be other costs and benefits that cannot be quantified in monetary terms as outlined above, such as improvements in journey quality, community severance within Banwell, and health/amenity benefits. Therefore, the economic appraisal is only one aspect of the overall case for investment and needs to be balanced against other environmental and social costs and benefits.

9 Other improvements

9.1.1 As a result of implementing a bypass of Banwell, there would be traffic impacts on the A368 and A371 corridors. There would be a reduction in traffic through the village of Banwell and there will be opportunities to make placemaking enhancements in the village centre.

9.1.2 The following section outlines the options for improvements that could be made to the wider A368 and A371 corridors and placemaking within Banwell. These other improvements common to all the do-something options will be considered in further detail during the Scheme design, following the results of the public consultation on which the public has been asked for their feedback.

9.1.3 These other improvements are considered to be common to all three northern bypass route options and would not change the scoring between the route options. It should be noted some improvements in this section such as improvement to public transport and road improvements through Banwell have been considered as part of the long list of options.

9.1.4 Several Parish Council meetings and workshops were held in May 2021 with Banwell, Winscombe & Sandford and Churchill Parish councils. These meetings have allowed us to better understand the existing situation in each village and to listen to the concerns of the community.

9.2 Banwell placemaking improvements

9.2.1 A bypass of the village of Banwell would remove the majority of through traffic, which would provide opportunities to improve and repurpose the existing route through the village. This can better meet the needs and aspirations of the community. Banwell village is within a Conservation Area, so all proposals need to consider this.

9.2.2 The following list outlines some of the opportunities that will be considered during design development. A range of measures will be selected and developed based upon how well they positively impact placemaking, value for money and feedback from the public consultation. The options under consideration are:

a) Gateway features at either end of village– with signage and landscaping;

b) A narrowing of the wider sections of the road to encourage slower traffic speeds and facilitate better use of space;

c) A priority system through the narrow/single lane sections and junction layouts within the village;

d) Green infrastructure (such as avenue planting, raised planters and wildflower planting);

e) Enhanced biodiversity using wildflowers and other planting;

f) Improved active travel routes and facilities – such as cycleways and footways, additional road crossing points and shared spaces including links back to Weston-super-Mare;

g) Creation of more outdoor space for local businesses (such as cafes, and shops);

h) Traffic enforcement – such as banning Heavy Goods Vehicles (HGVs) except for access / deliveries;

i) Physical traffic calming – such as road markings, traffic tables, shared space;

j) Reduced speed limits to 20mph to improve safety;

k) Improve active and sustainable travel on Wolvershill Road; and

l) Improvements to public transport infrastructure such as bus stop locations.

9.3 Wider network enhancements

9.3.1 General concerns raised include:

a) The potential impact of additional traffic from a bypass on communities along the A371 and A368;

b) A bypass making congestion even worse than it is now in nearby areas and villages;

c) During quieter periods, traffic speeds could go above speed limits, causing safety concerns on the road; and

d) Safety of local residents, particularly those that are vulnerable, when walking and /or cycling within their local communities.

9.3.2 The following list outlines the measures that will be considered during design development to consider the options to offset possible impacts in the surrounding villages and routes towards Weston-super-Mare. A range of measures will be selected and developed further based upon how well they positively impact the communities, value for money and feedback from the public consultation. The measures under consideration are:

a) Widening of narrow sections of carriageway along A368 where possible, which would smooth the flow of traffic, and could provide a footway for walking along the A368;
b) Improvements to the Churchill A368/A38 junction, which would smooth the flow of traffic and provide walking and cycling opportunities;
c) Side Road improvements to avoid “rat running” and improve walking and cycling travel routes;
d) Connectivity, replacement habitat and enhancement for protected species and habitats;
e) Biodiversity Net Gain;
f) Air quality and noise mitigation measures through planting and green barriers;
g) Native planting, rewilding, and locally indigenous planting;
h) Consideration of improvements to the local footways (adjacent to carriageways);
i) Improvements to pedestrian road crossing facilities;
j) Consideration of speed limits;
k) Speed limit enforcement measures;
l) Traffic calming measures (both physical and white lining); and
m) Public transport infrastructure provision- such as bus stop locations and facilities.

10 Risks

10.1.1 This section of the Options Appraisal Report outlines specific design & construction related impacts or risks which have been considered within the overall appraisal, and whether any of these would influence the route choice.

10.2 Ecological Licences

10.2.1 Alongside a planning permission for the Scheme, other consents and licences are likely to be required. An indicative list of these consents and licences are provided in Table 9. The potential refusal of any of these licences or consents would pose a risk to the delivery of the Scheme. As such, they have been considered during this Option Appraisal Study.

Table 9: Indicative list of consents/licence that may be required

Nature of consent	Legislation	Consenting Authority	Timing of consent
Habitat Regulations Assessment (with Appropriate Assessment where the Scheme will impact on designated sites)	The Conservation of Habitats and Species Regulations (Amendment) (EU Exit) Regulations 2019	North Somerset Council	Associated with planning permission (this will form part of the planning application)
Consent for working on Site of Special Scientific Interest (SSSI) Land	Section 28E of the Wildlife and Countryside Act 1981	Natural England	After planning permission
European Protected Species (EPS) Licence - actual species to be confirmed. Potentially: • Dormouse • Bats • Otter	The Conservation of Habitats and Species Regulations (Amendment) (EU Exit) Regulations 2019	Natural England	After planning permission
Wildlife Licences - actual species to be confirmed.	Section 16 Wildlife and Countryside Act 1981	Natural England	After planning permission
Licence for work affecting badgers	Protection of Badgers Act 1992, Section 10	Natural England	After planning permission
Water Abstraction License (if required)	Sections 24, 24A, 25 and 32 Water Resources Act 1991	Environment Agency	After planning permission

Nature of consent	Legislation	Consenting Authority	Timing of consent
Environmental Permit for water discharge or waste operations / registration of exempt waste operations and water discharges, or for working in/over a main river and potentially working in a flood plain (as necessary).	Environmental Permitting (England and Wales) Regulations 2016	Environment Agency	After planning permission
Tree Preservation Orders	The Town and Country Planning (Tree Preservation) (England) Regulations 2012	North Somerset Council	Associated with planning permission
Public Rights of Way (for permanent closures/diversions)	The Countryside and Rights of Way Act 2000 (CROW Act)	North Somerset Council	Associated with planning permission

10.2.2 An Environmental Impact Assessment will be conducted during the design development of the preferred route option. This will set out the baseline environmental conditions, undertake an assessment, and help determine any essential mitigation or enhancement measures as part of the Scheme. It will also inform which environmental consents or licences are required for the Scheme. The outcomes of this assessment will be reported in an Environmental Statement which will be submitted with the planning application for the Scheme.

10.2.3 At this stage, none of the ecological licences listed in Table 9, nor any other ecological concerns, are considered to pose a risk to the delivery of any of the northern bypass route options. Due to the increased impact on the North Somerset and Mendip Hills Bat SAC, the risk of being refused the required licences / consents for Routes 2 and 3 may be greater. However, mitigation measures are currently being explored (such as the removal of lighting from the eastern junction; placement of roundabout to avoid key bat flight lines and foraging areas etc.) which would reduce the impact at this location. The ecological concerns at this location are not considered to be insurmountable.

10.3 Flooding

10.3.1 It is likely that from a flood and water environment perspective, preference would be for Route 3 as there will be less potential impact as Route 3 avoids more of the high risk floodplain in comparison to

routes 1 and 2. If Routes 1 or 2 are selected, the Flood Risk Assessment will need to demonstrate that other factors in combination outweigh flood risk impacts through a Sequential Test approach, using information gathered from the options appraisal . The potential impacts of all options are considered to be mitigatable through design, with Routes1 and then followed by 2 requiring the most mitigation.

10.3.2 Routes 1 presents the most design and construction risk, followed by Route 2 which presents slightly less risk but more in comparison to Route 3. Overall, Routes 1 and 2 involve more watercourse and rhyne crossings than Route 3.

10.3.3 The potential requirements for compensatory flood storage areas would be assessed during design development, following detailed hydrological and hydraulic modelling.

10.4 Geotechnics

10.4.1 A Preliminary Sources Study Report (PSSR) (WSP, 2018) has been undertaken. This provides a geotechnical/geo-environmental desk-based study of the area surrounding the three northern bypass route options.

10.4.2 The PSSR outlines the geology and groundwater conditions within the study area. Table 5-2 of the PSSR provides a geotechnical risk register which covers the whole site of the three alignment route options.

10.4.3 The main geotechnical impacts and risks associated with the three bypass route alignment options relate to the construction of the embankment within the flood plain.

10.4.4 Due to the longer length that crosses the flood plain, there would be additional construction risks associated with the construction of Route 1 (with Route 3 having the least risks due to a shorter length within the floodplain). The increased risk would be due to the settlement magnitude and duration for the construction of the raised embankment.

10.4.5 Whilst the issues associated with constructing embankments within the floodplain are not insurmountable, they do add a degree of construction complexity, risks, and cost

10.5 Utilities

10.5.1 Information on utilities has been provided by various statutory undertakers within the immediate vicinity of the three route options.

10.5.2 In general, there are no utility concerns or risks that cannot be overcome by utilising best practice construction techniques. The impact of, and risks from, utilities within the immediate vicinity is generally low.

10.5.3 Route 1 does impact on an intermediate pressure gas main on the eastern extent of the Scheme (east of the solar farm). It also directly impacts on the new underground cable installed by National Grid as part of its Hinkley Connection Project[18]. The National Grid Hinkley Connection is an ongoing project (due to complete in 2026), therefore there is a risk that the Banwell Bypass project programme could be extended, which could impact on project completion and risk project funding. Whilst these interfaces are not insurmountable, they do add a degree of construction complexity, risk and cost.

[18] https://hinkleyconnection.co.uk/

11 Conclusion and Recommendations

11.1.1 This section provides a summary of the appraisal work undertaken and draws conclusions from the findings. Previous option appraisal work has been reviewed and considered throughout this appraisal.

11.2 Conclusion

Long List of Options

11.2.1 A long list of options was considered for improvements to Banwell. These were assessed at a high level against the WebTAG criteria (social & cultural, environment, and economic) as well as the Scheme objectives. The longlist included:

a) Reduce the need to travel;
b) Do nothing (Baseline);
c) Public transport and sustainable travel choices;
d) Road improvements through Banwell;
e) Bypass of Banwell, Churchill and Sandford;
f) Southern bypass of Banwell;
g) Northern bypass of Banwell; and
h) National Grid haul route.

11.2.2 The longlist of options was sifted, and a shortlist of options identified. This included the Do Nothing scenario (which was used as a baseline to measure against the other options) and a Northern bypass of Banwell.

11.2.3 Several of the long list of options that were discounted have been identified as being complementary to a bypass option. These will be considered further during the development of the Scheme design (see Section 11.4 below).

Layout Considerations

11.2.4 In order to ensure that the options presented were assessed equally, several design factors were analysed in greater detail, prior to the appraisal. A summary of these factors are:

a) Traffic Volumes - Based on the initial modelling undertaken, it is clear that providing a highway link to bypass the village of Banwell will reduce the amount of traffic on the A371 through

Banwell. The highway link will alleviate the congestion issues that the narrow, single lane section of the A371 causes, and would facilitate the free flow of traffic through Banwell. The bypass would also attract additional traffic from alternative routes as it becomes a more reliable east/west route across North Somerset, which could increase traffic through surrounding villages.

b) Highway Cross-section – It is proposed that the Banwell bypass would be a single carriageway bypass rather than a dual carriageway, because: it would be in keeping with the surrounding road network; the traffic flows do not require a dual carriageway; and fewer materials would be required to construct a single carriageway, therefore reducing impact on flooding and construction carbon emissions.

c) Design speed / speed limit – a 40mph is adjudged to be the most reasonable speed limit for the Banwell bypass, because:– a lower speed limit allows the road alignment to be more flexible, minimising impact on the local environment; lower speed limits allow for safer, more attractive walking, cycling and horse-riding routes; the surrounding highway network is largely 40mph or less. A 40mph speed limit would be in keeping with the rest of the local area; and lower vehicle speeds in free flow conditions reduce vehicle emissions when compared to higher speeds.

Shortlist appraisal

11.2.5 Following detailed consideration of the shortlisted options it has been determined that, on balance, Route 2 is considered the most favourable route when reviewed against its likely impacts and Scheme objectives. Table 10 provides a summary of the appraisal against the WebTAG criteria.

Table 10: Overall Appraisal Summary Table

		Do Nothing	Common Route Alignment	Route 1 (Northern Route)	Route 2 (Central Route)	Route 3 (Southern Route)
Social and Cultural	Non-business users	- - -	0	+++	+++	+++
	Physical activity	-	+	++	++	++
	Journey quality	- -	0	+++	+++	+++
	Accidents	-	-	+	+	+
	Security	-	-	0	0	0
	Access to services	- - -	- -	++	++	++
	Affordability	0	0	0	0	0
	Severance	-	0	++	++	0
	Option values	0	0	0	0	0
Environmental	Noise	-	+	+++	++	+
	Air quality	0	0	++	++	+
	Greenhouse gases	0	0	- - -	- -	- -
	Landscape	-	-	- -	- -	-
	Townscape	-	-	++	+	-
	Historic environment	0	0	0	0	-
	Biodiversity	0	0	- -	- - -	- - -
	Water environment	0	-	- - -	- -	-
	Flood Risk	0	0	- - -	- -	-
	Geology and Soils	0	- -	- -	- -	- -
	Agricultural Land Holdings	0	-	- - -	- -	-
Economic	Business users & transport providers	- - -	0	+++	+++	+++
	Reliability	- -	0	++	++	++
	Wider impacts	0	0	0	0	0
Public Accounts	Cost to broad transport budget	0	0	- - -	- -	- -
	Indirect tax revenues	0	0	0	0	0
Distributional Impacts	User benefits	- - -	0	+++	+++	+++
	Noise	-	+	+++	+++	+++
	Air quality	0	0	++	++	++
	Accidents	-	-	+	+	+
	Security	-	-	+	+	+

		Do Nothing	Common Route Alignment	Route 1 (Northern Route)	Route 2 (Central Route)	Route 3 (Southern Route)
	Severance	-	+	+	+	-
	Accessibility	- - -	- -	++	++	++
	Affordability	0	0	0	0	0
Indicative Benefit Cost Ratio	Cost to Private Sector	0	0	0	0	0
	Indicative Net Present Value	0	0	0	0	0
	Indicative Economic BCR	0	0	0	0	0

11.2.6 The following paragraphs provides a comparison of the key differentiators of the different route options.

11.2.7 **Carbon emissions** - from our initial carbon assessments, both Route 2 and 3 have a lower impact on Embodied Carbon than Route 1 due to Route 1's overall length and greater length of construction in the floodplain where ground treatment is required to control settlements of the embankment overlying soft soils. Route 2 is the shortest overall alignment, however there is a slightly greater Embodied Carbon impact than Route 3 again due to greater length on the floodplain. With Respect to User Carbon (greatest contributor of Carbon Impact) all Routes have a similar impact however Route 1 has a slightly greater impact than the others and Route 2 has the lowest impact for the future year (2038) scenario.

11.2.8 **Flooding** – Though all Routes impact on the flood plain, Route 2 travels through it for a shorter length than Route 1, requiring fewer mitigation features and their associated impacts. Route 3 has the least impact as it crosses the shortest length of flood plain.

11.2.9 **Land take and severance –** Route 3 separates the properties at Riverside from Banwell, which will have a negative impact on that community. All routes pass through agricultural land and would result in some severance of land and access. Route 2 passes to the north of the Banwell Football club, but it severs the land used as football pitches. Route 1 has the highest amount of land take due to the route length, alignment and especially at the eastern junction. On balance 2 has the least impact.

11.2.10 **Noise and Air Impacts** – All three routes improve existing noise and air quality issues by removing traffic from the centre of Banwell, therefore meeting the Scheme objective to improve and enhancing Banwell's public spaces. Routes 1 and 2 share similar air quality and noise benefits, whereas Route 3 is least beneficial because it is closer to, and therefore has greater noise and air impacts on, houses at the edge of Banwell and at Riverside. Route 1 has the lowest traffic noise impact on existing properties. Route 2 is less beneficial because of its proximity to properties at Riverside, but overall it still delivers benefits to properties in Banwell.

11.2.11 **Biodiversity –** Route 2 and 3 are closest to the North Somerset and Mendip Hills Bats Sites SAC and Banwell Ochre Caves SSSI, which could have an indirect impact on these sites. Although Route 1 is furthest from the SAC and therefore has less of an indirect impact, it is the longest route and therefore impacts on a greater area of habitat loss and severance when compared to Routes 2 and 3. Route 2 has the greatest opportunity for providing a balance of impacts and habitat enhancements to meet the Scheme objectives and can be satisfactorily mitigated to provide the required BNG.

11.2.12 **Historic and landscape impact** – Route 2 requires less land than Route 1 so is less likely to impact on the landscape or encounter buried archaeology. Route 2 is also further away from the Banwell Conservation Area, SM and Banwell historic core than Route 3, however Route 2 passes through a traditional orchard at Riverside. Route 2 has the greatest opportunity for providing a balance of impacts to meet the Scheme objective of minimising visual and landscape impacts. Routes 1 and 2 would have a greater adverse impact on views from the Mendip Hills AONB.

11.2.13 **Traffic Impacts** – All Routes have a positive impact on reducing traffic through Banwell. However, when travelling to Winscombe along the

A371, Route 1 is the longest and least direct route, which means more traffic may continue to use the route through Banwell village rather than the bypass. Routes 2 and 3 provide the most direct route and therefore best meet the Scheme objective of improving the local road network and dealing with existing congestion as well as facilitating enhancing Banwell's public spaces.

11.2.14 All route options provide equal opportunity to meet the Scheme objectives to increase Active and Sustainable Travel as well as delivering infrastructure to enable housing.

Route 2 impacts

11.2.15 From the appraisal, several key impacts of Route 2 have been identified, which will require careful consideration and appropriate mitigation through the developing design. These impacts are:

a) Cutting off Public Right of Way (PRoW) and private access to land;

b) Ecology, especially the impact of lighting on the North Somerset and Mendip Bat SAC and Banwell Ochre Caves SSSI; the wetland and rhyne system and on species such as bats, dormice, great crested newts, reptiles, invertebrates, and breeding birds;

c) Flood mitigation; to ensure the level of flood protection in the local area is not reduced by the scheme and that the bypass itself is resilient to flooding;

d) Football pitches by Banwell FC east of Riverside; to minimise the impact on this community facility as much as possible;

e) Traditional orchard at Riverside and ancient woodland at Towerhead; to minimise the impact on the traditional orchard and ancient woodland as much as possible;

f) Landfill to the west of Riverside; provide appropriate mitigation for construction on the historic landfill; and

g) Rhyne and drainage ditches flows, habitats, and wildlife – to minimise disturbance as much as possible.

h) Historic and landscape impact; impact on landscape and buried archaeology; orchard at Riverside and the Mendip Hills AONB.

Southern Link

11.2.16 A WebTAG assessment was undertaken for the Southern Link, which outlines that, on balance, it is considered beneficial to include the Southern Link as part of the overall Scheme. The benefits of providing the Southern Link, delivered together with the Banwell bypass, would likely be:

a) A greater number of vehicles driving in both directions would use the new bypass instead of continuing to use the A371 through Banwell in order to travel towards Winscombe;

b) Vehicles travelling on routes from the Winscombe and Cheddar areas would be able to access the bypass without using the A368/A371 junction and the narrow sections of Castle Hill.

c) Lower levels of traffic along the A371 through Banwell would increase the opportunities for walking, cycling and horse-riding; and

d) Fewer vehicles would need to continue to use the A368/A371 junction and the narrow sections of Castle Hill, resulting in less congestion and air and noise pollution. Castle Hill would also become a cul-de-sac, which would have benefits for residents.

11.3 Outcome

11.3.1 The outcome of this option appraisal is that the Northern Bypass Route 2 is the favoured route option. The outcome of the Public Consultation should be considered, together with this Options Appraisal and a decision made on a preferred route.

11.3.2 The preferred route should then progress to design development and a full Environmental Impact Assessment (EIA) undertaken on the route. This will then form the basis of a Planning Application.

11.4 Next Steps and further considerations

11.4.1 In line with the recommendations above, the following list of next steps and further considerations has been developed. These should be considered during the development of the Scheme design:

a) **Sustainability** – several sustainability reviews, workshop and training sessions have been undertaken during the development of the options appraisal. These have highlighted opportunities to improve the Scheme outcomes in all areas of sustainability. A further sustainability workshop will be held early on to

review the actions of these previous workshops and agree a way forward.

b) **Carbon management** – a Carbon Management Report has been prepared during the options appraisal process. Carbon reductions and opportunities needs to continue to be at the forefront of the development of the design.

c) **Junction strategy** – further consideration of junction form and location for the each of the tie in roundabouts (A371 west of Banwell and A368 east of Banwell) as well as at Wolvershill Road and Riverside.

d) **Biodiversity and Landscape –** early detailed consideration needs to be given to the landscape design and integration of biodiversity enhancements, as well as avoidance / minimising impacts (to achieve Biodiversity Net Gain).

e) **Speed limit –** further consideration of the speed limit will be given, to understand the merits of potentially reducing the limit further to 30mph.

f) **Lighting Strategy** – Given the sensitive nature of the route option from a Biodiversity and landscape perspective, road lighting will need to be carefully considered to ensure impacts are adequately mitigated. A lighting strategy should be developed

g) **Alignment refinement** – Through the option appraisal process, several opportunities have been identified to refine the alignment of Route 2, to reduce its overall impact. This includes the areas around the traditional orchards, ancient woodland, landfill, and football pitches, as well as the tie into the eastern end to minimise impact on Bat SACs.

h) **Wider network mitigation measures** – The traffic modelling that has been undertaken to date shows that there would be an impact on the surrounding road network (A371 and A368). We are considering options for wider network enhancements in adjacent communities as part of the Scheme.

i) **Active and sustainable transport –** the WCHR Assessment outlines some potential improvements to walking and cycling provision in the local area. Through the options appraisal process, it has been noted that bus priority measures should be carefully considered in any Scheme design.

12 References

Atkins, 2006. *Greater Bristol Strategic Transport Study,* s.l.: s.n.

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Appendices

Appendix A Route Options Plan

Appendix B Environmental Constraints Plan

Appendix C WebTAG Assessment Criteria

The WebTAG Appraisal Criteria defined in the following section is outlined within the Department for Transport's Transport Analysis Guidance. It is replicated here for ease of reference.

Environmental

Assessment Area	Assessment Method
Noise	Collation and review of all relevant and readily available baseline environmental conditions data. Desktop and GIS based identification of likelihood and potential severity of impact, given nature of intervention option.
Air Quality	Collation and review of all relevant and readily available baseline environmental conditions data, followed by desktop and GIS based identification of likelihood and potential severity of impact, given nature of intervention option.
Greenhouse Gases	Emissions rates per km and indicative volumes and distances as estimated for 'Improve connectivity', under 'Support economic growth'.
Landscape	Collation and review of all relevant and readily available baseline to establish the characteristic and locally distinctive features of an area. Desktop and GIS based identification of likelihood, potential severity and incremental impact, given the nature intervention option
Townscape	Collation and review of all relevant and readily available baseline to establish the urban characteristics. Desktop and GIS based identification of likelihood and potential severity of impact, given nature of intervention option.
Historic Environment	Collation and review of all relevant and readily available baseline to establish the heritage character for an area including NMR to establish known built heritage, archaeology and potential for archaeology. Desktop and GIS based identification of likelihood, potential severity and incremental impact, given nature of intervention option
Biodiversity	Collation and review of all relevant and readily available baseline to establish the characteristic biodiversity and earth heritage features of an area. Desktop and GIS based identification of likelihood, potential severity and incremental impact, given nature of intervention option.
Water Environment	Collation and review of all relevant and readily available baseline environmental conditions data. Desktop and GIS based identification of likelihood and potential severity of impact, given nature of intervention option.
Option Values	Qualitative assessment of the impact of the option on communities in terms of the option value associated with service additions / withdrawals.

Economic

Assessment Area	Assessment Method
Business users and transport providers	**Business Users:** Assessment of the extent to which journeys can be made within a reasonable time and at reasonable cost, focusing on improvement in end to end journey times and money costs. The focus should be on the connectivity benefits to freight, business and commuting users only. Adoption of simple spreadsheet or other "light touch" models to derive annual and PVB in line with WebTAG principles. Demand derived from travel market analysis as part of evidence base to identify need for intervention in first instance - adopt "worst case" principle in deriving potential beneficiaries. Indicative 'with intervention' and 'without intervention' savings, derived through simple journey cost impact assessment of option design/specification relative to 'without intervention' scenario. **Transport providers:** Calculation of changes in revenue to transport providers utilising simple spreadsheet demand and revenue models drawing on travel market analysis as part of evidence base to identify need for intervention in first instance - adopt "worst case" assumptions in revenue calculation.

Assessment Area	Assessment Method
Reliability	A qualitative assessment of the impact of the option on reliability based on review of Stage 1 level design and specification. Reliability impacts need only be identified where intervention has been designed to address reliability. Otherwise, present "at least no worse off" evidence. The focus should be on the reliability benefits to freight, business and commuting users and transport providers.
Wider Impacts	Where impacts are likely to be notable and considerably vary between options, indicative assessments should be based on estimated changes in travel times between employment areas

Social and Cultural

Assessment Area	Assessment Method
Non-business Users	Qualitative assessment of the impact of the option on, reliability and connectivity for non-work and non-commuting journeys. Estimate impact on travel times, costs and reliability for leisure trips using the approaches outlined for commuting and business trips in the Reliability challenge above.
Physical Activity	Identification of whether intervention is likely to generate additional numbers walking or cycling with indication of numbers of each.
Journey Quality	Qualitative assessment of changes to the end to end journey experience of transport users (considering traveller care; travellers' views; and traveller stress).
Accidents	If evidence base has highlighted accidents as amongst the key problems and challenges to be addressed, then review likelihood of options addressing problem in the light of Stage 1 design / specification characteristics and potential to impact on traffic flows. If accidents NOT identified as a problem/challenge driving intervention, then analysis should be limited to reviewing option design/characteristics to ensure no considerable accident risk is introduced.
Security	If evidence base has highlighted crime or security as amongst the key problems and challenges to be addressed, then review likelihood of options addressing problem in the light of Stage 1 design specification/characteristics. If security NOT identified as a problem/challenge driving intervention, then analysis should be limited to reviewing Stage 1 design/characteristics to ensure no considerable security risk will be introduced.
Access to services	Assessment of level of impact on people accessing the transport system, especially those households without a car. Accessibility impacts need only be identified where intervention has been designed to address accessibility. Otherwise present "at least no worse off" evidence.
Affordability	Assessment of level of impact on the affordability of the transport system to users. Affordability impacts need only be identified where intervention has been designed to address affordability. Otherwise present "at least no worse off" evidence.
Severance	Evidence-based judgmental assessment of the impact of the transport intervention on severance, and estimation of the indicative numbers of people who will be affected.
Option Values	Qualitative assessment of the impact of the option on communities in terms of the option value associated with service additions / withdrawals.

Public Accounts and Indicative Benefit Cost Ratio (BCR)

Assessment Area	Assessment Method
Cost to broad transport budget	**Central Government:** Estimation of capital and operating/maintenance costs based on application of standard unit rates. Application of credible worst-case inflation and optimism bias in line with relevant guidance and discounted consistent with WebTAG to derive Present Values (£PVs). **Local Government:** As for central government for local government contribution to scheme costs.
Indirect Tax Revenues	Estimate of indirect tax and revenue impacts on public sector based on indicative changes in volume and fares, charge and tax rates per kilometre or trip.
Cost to Private Sector	As for broad transport budget (central government) above for private sector contribution to scheme costs
Indicative Net Present Value	Present Value of Benefits (PVB) - Cost to Private Sector- Present Value of Costs (PVC)
Indicative Economic BCR	(PVB-Cost to Private Sector)/PVC

Distributional Impacts

Assessment Area	Assessment Method
Separate rows required to represent assessment of each of the 8 indicators: user benefits noise air quality accidents security severance accessibility affordability	High level assessment of potential social and distributional impacts relating to user benefits, noise, air quality, accidents, security, severance, accessibility, and personal affordability.

Appendix D Long List of Options Appraisal

D.1 Reduce the need to travel through Banwell

D.1.1.1 Options have been considered to reduce the need to travel by;

a) supporting remote working;

b) locating more amenities closer to where people live;

c) improving access to fast and reliable broadband, and

d) encouraging deliveries to use more sustainable travel choices especially for 'last-mile' deliveries.

D.1.1.2 The main benefit of reducing the need to travel is taking motor vehicles off the road. This is a contemporary issue in the context of Covid-19 and the alterations to how people work. Reduction in the need to travel would result in some improvements to the highway network as congestion is reduced, travel reliability improved and potentially likelihood of accidents reduced. There would be improvements to noise, air quality, biodiversity of areas and a reduction in Greenhouse gases.

D.1.1.3 There would be improvements to travel to work reliability with less vehicles on the road during peak periods. However, people will continue to use existing highway networks into the future and without adequate infrastructure in place, these networks would continue to suffer.

D.1.1.4 Reduction in the need to travel would not adequately satisfy the schemes objectives. Although it would make great environmental improvements if taken up by a large proportion of the population, this is considered to be unrealistic in the short term. Reducing the need to travel would have to be implemented on a mass scale and require multiple changes to working and social life. In addition to this, not all employment can be undertaken through remote working. Overall reduction in travel would not meet the projects objectives.

D.1.1.5 Reduction in the need to travel may require improvements to placemaking, land allocations, new developments to come forward and changes to socioeconomic patterns.

D.1.1.6 Reduction in the need to travel would have its benefits but it is unlikely that it could be implemented successfully on a major scale which would result in sustainable benefits. In addition to this, it would not align with the project objectives

D.2 Do-nothing

D.2.1.1 This option assesses the situation without any improvements above and beyond any committed / likely development in the area. The Do-Nothing option would not include the safeguarded bypass route, nor would it include the 3,000 houses for residential allocation which is currently under consideration with the Local Plan. The residential allocation has not been included as without the proposed infrastructure the housing would not be able to be delivered.

D.2.1.2 The benefits of the Do-Nothing scenario would mainly be the limiting of any potential negative impacts the proposed bypass could cause. Any adverse impacts of the bypass scheme will be assessed in following sections below.

D.2.1.3 In 2038 in the Do-Nothing scenario the volume of traffic through Banwell is forecast to increase by around 12% compared to the current situation. This forecast growth leads to longer delays, to some sections of the road operating above capacity, and to journey times increasing by up to 59% during peak periods. This is likely to result in a large adverse impact on non-business users, journey quality and access to services. As there is no railway station within Banwell, journeys to the nearest rail services by private vehicles, public transport or other services would be adversely affected by increased traffic.

D.2.1.4 The higher forecasted traffic would have an impact on walking and cycling in the area. The increase in traffic would make walking and cycling to other facilities less appealing for non-business users, reducing active travel opportunities. This discouragement of active travel measures would also have a light impact upon physical activity. Further to this, there would be a slight adverse impact upon severance between the northern and southern sides of the village for pedestrians and cyclists. This is due to increased traffic through Banwell making it more difficult for pedestrians and cyclists to cross the road.

D.2.1.5 The likelihood of accidents involving walkers and cyclists would increase in the Do-Nothing scenario due to the increased potential of conflict with vehicles. Accident analysis of accidents between 2015-2019 has shown that a cluster of accidents occurred on the A371 in Banwell around the West Street / East Street / Castle Hill / High Street crossroads. This section of the A371 has a particularly narrow section of carriageway suitable only for vehicles to travel in one direction at a time, with no footways for pedestrians. This increases the risk of traffic related security incidents and impacts the users journey quality due to fear of accidents.

D.2.1.6 The environmental impacts are assessed on the basis that without the proposed scheme, traffic would increase. This would result in increasing noise exposure for a large number of properties through the more densely part of Banwell on Knightcott Road. This would also lead to a erosion of the areas landscape; continues intensification of green landscape and gradual erosion of historic and rural landscape character. In addition to this, traffic would further dominate the village. Also, without the infrastructure, future residential developments would rely small scale developments on the edge of the village. This would damage the villages townscape.

D.2.1.7 Whilst the volume of traffic through Banwell is forecast to increase by around 12% compared to the current situation, over the longer term there are expected to be improvements to air quality due to improvement in the fleet uptake of electric vehicles. There would also be a light negative impact to biodiversity but the situation for the water environment, flood risk, agricultural land, geology, and soils would remain unchanged.

D.2.1.8 Economically; an increase in travel time would result in large adverse impacts for freight, business and commuting journeys. In particular, journey costs would be increased. Also cycling and walking would be less appealing which may reduce footfall to local shops and other facilities part of the local economy.

D.3 Public transport and sustainable travel choices

D.3.1.1 Improvements have been considered to public transport and active travel opportunities such as walking, cycling and horse riding around Banwell.

D.3.1.2 Active travel connectivity has been considered between residential areas, the village centre, railway stations, healthcare, schools, and leisure facilities including cycle lanes, paths, and route signage. This option would also include improved connectivity with longer distance leisure/tourism/commuting routes for active travel. Establishing a network of 'Greenways' in Banwell. Also, active travel journeys could be optimised in Banwell as the 'new normal', following increased walking and cycling as a result of the pandemic.

D.3.1.3 Active travel would have benefits to both social and environmental factors. Active travel would improve journey quality, physical activity for residents, less concern around accident security and there would be no severance leading to improved opportunities for active travel routes.

D.3.1.4 These measures would meet some of the schemes environmental and sustainability objectives, they would not sufficiently address the existing traffic problems. As such, this option has not been taken forward to a shortlist. However, improvements to both public transport and sustainable travel choices across North Somerset are being progressed by the council with an aim of achieving carbon neutrality by 2030. These improvements will promote active travel and complement a northern bypass.

D.4 Road improvements through Banwell

D.4.1.1 The road improvement option would consist of the widening of the existing road or junctions through Banwell. This would require land being allocated to facilitate the larger road. As such, buildings would need to be demolished and Compulsory Purchase Orders (CPO) would be required for widened roads. Given a considerable area of Banwell is a Conservation Area, this would have detrimental impact to the historic fabric of Banwell.

D.4.1.2 Road improvements would have both negative social and environmental impacts. Widening roads would result in less conflict along the roads as the road goes down to a single lane as existing. However, with the traffic increase predictions of up to 12% by 2038, the roads would be busier which could lead to more road accidents. Busier roads would also negatively impact access to services, especially for those walking/cycling within Banwell.

D.4.1.3 Increased traffic continuing to travel through Banwell would result in further noise pollution and harm to air quality in Banwell. As noted, widening the road would include demolition of buildings. This would harm the historic fabric of Banwell and erode the rural landscape in the village. There are mature trees along the existing road, if the road is widened these may be lost. Also, existing tress and housing to be demolished may be used for roosting bats and if these roosts are lost, there could be ecological concerns.

D.4.1.4 Although traffic may flow smoother with wider roads in place, the economic impacts of increased traffic through Banwell would potentially result in delays to

journey times. As such, this would have an adverse impact on journey costs for freight, business, and commuting users. The demolition of buildings may include the loss of retail units. This would harm the both the character of the area and the local economy. The local tourism economy in the area would be harmed without business and retail units.

D.4.1.5 This option would meet very few of the scheme objectives and would adversely impact air quality and traffic noise through Banwell. As such, this option has not been taken forward to a shortlist.

D.5 Bypass of Banwell, Churchill and Sandford

D.5.1.1 This option has been considered in the past and would include a larger bypass being implemented for Banwell, Churchill and Sandford. A larger bypass would increase the risk of severance and impact to environment.

D.5.1.2 This route would have been to the north of the villages. It would have been far more extensive and expensive as it was proposed to far larger than the Banwell bypass. Severance of the longer bypass would have increased having negative impacts to waterways, existing rights of way and required more CPOs. There is a number of listed buildings close to this proposal, for example, the Grade II Honey Hall. A Site of Nature Conservation Interest and a Site of Special Scientific Interest (SSSI) at Cheddar Valley Railway Nature Reserve and Puxton Moor Nature Reserve . There are also two other SSSI's and tree preservation order areas along the proposed route. This route may have had worse environmental impacts given its larger design and constraints in the area.

D.5.1.3 The larger route would have had detrimental impacts to the rural and historic character in the area. It would also have included more junctions and other road works which would have made the scheme more expensive and unaffordable.

D.5.1.4 Overall, the larger scheme would have resulted in more harm to the environment. It would also have been expensive and unaffordable within the available budget. As such, this option has not been taken forward to a shortlist.

D.6 Southern bypass of Banwell

D.6.1.1 This option would be a link to the south of the settlement of Banwell. It would be located primarily within the Mendip Hills AONB.

D.6.1.2 A bypass route to the south of Banwell would meet some of the scheme objectives. It would help offset the traffic issues through Banwell.

D.6.1.3 The south of Banwell is heavily constrained. The Mendip Hills AONB covers the majority of the area. There are several sites of Nature Conservation Interest including the site from Whitley Head to Winthill House. There is a SSSI and a Special Area of Conservation (SAC) at Banwell Ochre Caves. Further south is the Lox Yeo River site of Nature Conservation Interest which spans a considerable distance. There are 2 scheduled monuments including a Roman settlement, several Listed Buildings and the Banwell Conservation Area extends predominately southwards.

D.6.1.4 Overall, given the highly constrained nature to the south of Banwell. A bypass in this location would have adverse environmental impacts and harm the character of the area.

D.7 Northern bypass of Banwell

D.7.1.1 A bypass route to the north of Banwell has been considered. The alignment would pass between the A371 and Wolvershill Road, carrying on in a generally easterly direction to meet the A368 to the east of Banwell.

D.7.1.2 The route passes through a floodplain for much of its route which would increase flood risk and the conveyance of flood water. There is also potential for impact on known buried archaeology within the area.

D.7.1.3 A northern bypass would not have a direct impact on the environmentally designated areas located to the south of Banwell (e.g. SAC, SSSI, AONB) however could have an indirect impact on these areas, especially for ecology.

D.7.1.4 The removal of a vast majority of the traffic from the middle of the village of Banwell would alleviate existing congestion issues. It would reduce noise, improve air quality, and provide opportunities for active travel improvement. It would also benefit the townscape & historic nature of Banwell.

D.7.1.5 This option is considered to meet many of the scheme objectives. It would provide access to the proposed development east of Weston-super-Mare that may be identified in the emerging local plan and would therefore be resilient to the resultant traffic growth.

D.7.1.6 Given the benefits that this option would bring, and alignment with the scheme objectives, this option has been taken forward for more detailed assessment.

D.8 National Grid haul route

D.8.1.1 The temporary road associated with National Grid's Hinkley Point C Connection Project has been considered as an alternative to the southern link. This option would need to be provided in combination with a bypass as it would not address congestion issues in Banwell on its own. This has been considered as an alternative route to the proposed Southern Link.

D.8.1.2 This haul route has been constructed on a temporary basis and is subject to its own planning permission, which outlines that the land will be returned to its former condition when construction of the Connection Project has been completed.

D.8.1.3 A permanent road along this alignment would have a negative impact on the Mendip Hills AONB and the local environment and as such this option has not been taken forward to a shortlist.

Appendix E Table Southern Link Assessment Summary

HIF Banwell Bypass and Highway Improvements WebTAG Criteria		Southern Link – Do Nothing	Southern Link
Social and Cultural	Non-business users	0	+++
	Physical activity	-	++
	Journey quality	-	+
	Accidents	-	+
	Security	0	0
	Access to services	-	0
	Affordability	0	0
	Severance	-	+++
	Option values	0	0
Environmental	Noise	-	0
	Air quality	0	++
	Greenhouse gases	-	-
	Landscape	-	-
	Townscape	-	++
	Historic environment	0	+
	Biodiversity	0	-
	Water environment	0	+
	Flood Risk	0	0
	Geology and Soils	0	-
	Agricultural Land Holdings	0	0
Economics	Business users & transport providers	-	+
	Reliability	-	+
	Wider impacts	0	0
Accounts	Cost to broad transport budget	0	0
	Indirect tax revenues	0	0
Distributional Impacts	User benefits	-	+
	Noise	-	-
	Air quality	0	0
	Accidents	-	+
	Security	0	0
	Severance	-	0
	Accessibility	0	+
	Affordability	0	0
BCR	Cost to Private Sector	0	0
	Indicative Net Present Value	0	0
	Indicative Economic BCR	0	0