

# A1 Birtley to Coal House

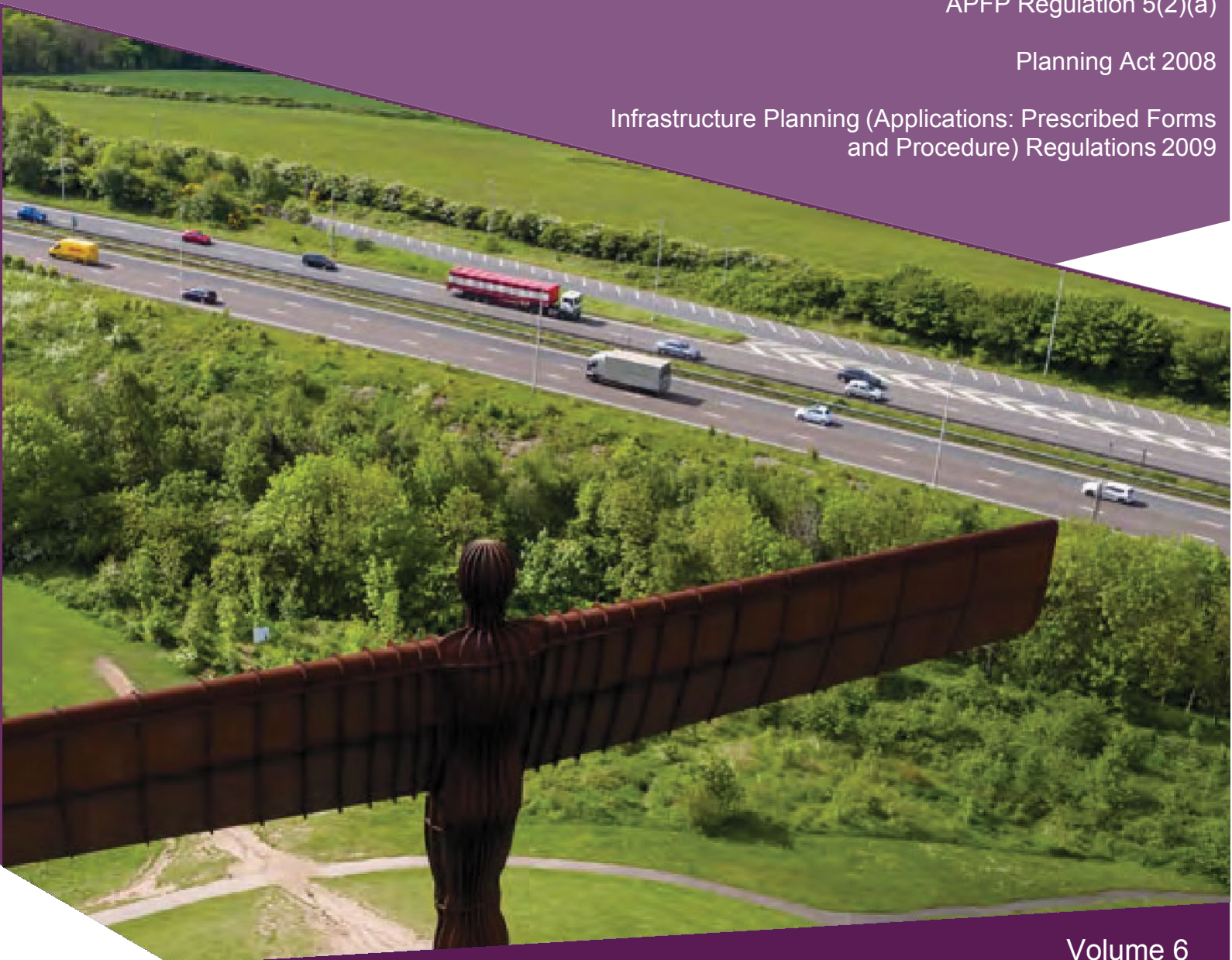
## Scheme Number: TR010031

### 6.1 Environmental Statement Chapter 3 Assessment of Alternatives

APFP Regulation 5(2)(a)

Planning Act 2008

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



Infrastructure Planning

Planning Act 2008

**The Infrastructure Planning  
(Applications: Prescribed Forms and  
Procedures) Regulations 2009**

**A1 Birtley to Coal House  
Development Consent Order 20[xx]**

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**Environmental Statement**

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<b>Regulation Reference:</b>	APFP Regulation 5(2)(a)
<b>Planning Inspectorate Scheme Reference</b>	TR010031
<b>Application Document Reference</b>	TR010031/APP/6.1
<b>Author:</b>	A1 Birtley to Coal House Project Team, Highways England

<b>Version</b>	<b>Date</b>	<b>Status of Version</b>
Rev 0	14 August 2019	Application Issue

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### 3 ASSESSMENT OF ALTERNATIVES

#### 3.1 INTRODUCTION

3.1.1. The Environmental Impact Assessment Regulations (EIA Regulations) require a description of the reasonable alternatives that have been studied, which are relevant to the Scheme and its special characteristics, providing an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects.

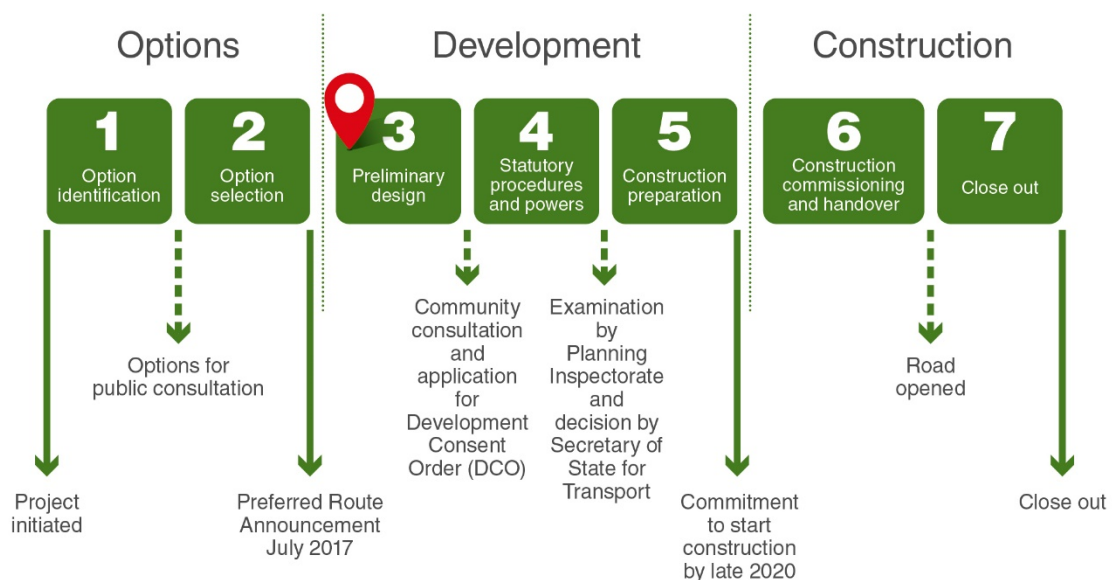
#### 3.2 ASSESSMENT METHODOLOGY

3.2.1. All major road schemes are progressed through the Applicant's major project lifecycle steps as follows:

- a. Strategy, Shaping & Prioritisation
- b. Option Identification
- c. Option Selection
- d. Preliminary Design (the current Stage)

3.2.2. The stages are split into three phases: options, development and construction, which are broken down into stages (refer below to 'in text' **Figure 3-1**). Each stage is aligned to specific milestones to reflect the significant decision points in the project's development and delivery. The Scheme is currently at Preliminary Design stage.

**Figure 3-1 - Highways England major projects lifecycle**



3.2.3. Each stage is subject to a Stage Gate review (SGAR) prior to commencing to the next stage. SGARs provides assurance that the current stage of a scheme is complete and the work done is robust, the major project lifecycle steps (as described in **paragraphs 3.2.1 and 3.2.2** above) have been followed for this Scheme.



### 3.3 REASONABLE ALTERNATIVES STUDIED

#### STRATEGY, SHAPING & PRIORITISATION

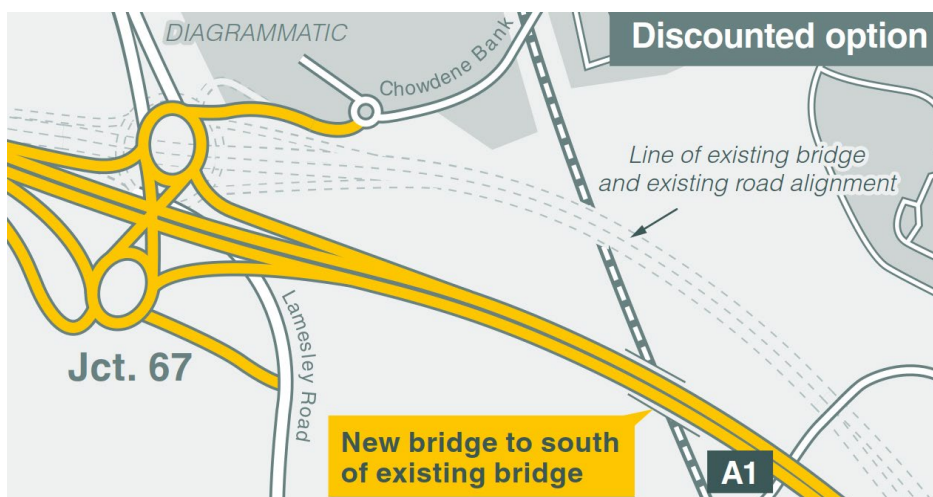
- 3.3.1. In 2014, a Feasibility Study (**Ref 3.1**) (following WebTAG methodology) published in 2015 was undertaken to determine pre-existing issues on the A1 Newcastle Gateshead Western Bypass (NGWB) in order to prioritise the road sections which most urgently required upgrading. During this study, the feasibility of conceptual routes was appraised using sifting tools. Nine full length options were considered, ranging from full widening to a technology only scheme, in addition to three shorter congestion relief options.
- 3.3.2. The Feasibility Study led to the definition of the scope of work for improvement to the A1 NGWB from junction 67 (Coal House) to junction 65 (Birtley) (including Allerdene Bridge) as announced in the RIS in December 2014, which was progressed to the Options Identification Stage.

#### OPTION IDENTIFICATION

- 3.3.3. At the Option identification stage three options were identified within the existing A1 corridor between junction 65 (Birtley) and junction 67 (Coal House) and an environmental desk based assessment was carried out which identified environmental constraints. The assessment followed DMRB methodology (**Ref 3.2**) which highlighted the key environmental issues for each option and the potential further environmental assessment work required at the next stage.
- 3.3.4. The three options each had the same alignment and cross section at junction 66 (Eighton Lodge) and junction 65 (Birtley). The main difference between the options was the approach to replacing Allerdene Bridge, either in the existing footprint or to the south of the existing structure. The options were as follows:
- a. Option 1 - Allerdene Bridge would be replaced in its current location. This would require a temporary bridge to be constructed to carry traffic over the A1 while the new bridge is constructed. This option would be a more complex scheme to construct requiring more traffic management and a longer construction period.
  - b. Option 2 - Allerdene Bridge would be replaced immediately south of its current location, improving the existing road alignment. To accommodate the new alignment, it was considered that there may be a requirement to replace Smithy Lane Overbridge.
  - c. Option 3 - Replacement of Allerdene Bridge approximately 200m to the south of the existing structure, which would require the section between Eighton Lodge and Coal House (junction 66 (Eighton Lodge) to junction 67 (Coal House)) to also be offline (refer below to 'in text' **Figure 3-2**). During the options phase it was agreed that Option 3 would not be developed any further. This was due to Option 3 being almost twice the cost of the alternative options but providing the same level of benefits to the road user and area. This option would also require the demolition of Kingsway Viaduct (at Coal House Roundabout junction 67) and Highways England Structural Engineers confirmed that this Viaduct was fit for purpose. The Options Identification stage concluded that the benefits for all three options were similar but the costs for Option 3 were significantly

higher with more land-take and a larger impact on the surrounding environment. Consequently, this option did not offer better value for money compared to Options 1 and 2 and the decision was therefore made that Option 3 would not be developed any further.

**Figure 3-2 - Option 3 – Replacement of Allerdene Bridge approximately 200m south of existing structure (discounted option)**

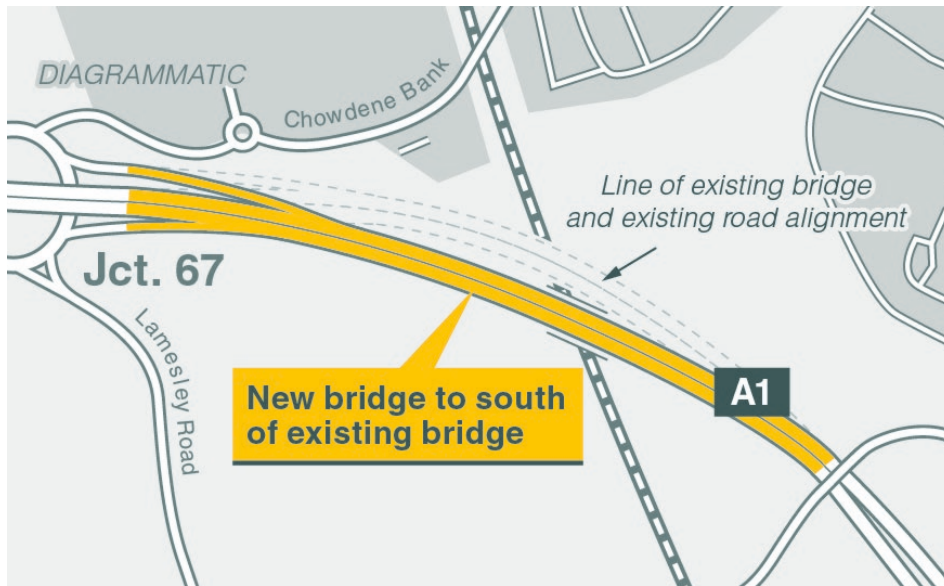


## OPTION SELECTION

- 3.3.5. At the Option Selection Stage, a further Scoping exercise was carried out in accordance with DMRB methodology to review the scope of assessment identified at the previous stage to ensure it was still appropriate and proportionate in line with the principles of Interim Advice Note (IAN) 125/15 'Environmental Assessment Update' (Ref 3.3).
- 3.3.6. It was considered that for traffic related topics, i.e. Air Quality, Noise, and Water and Drainage, where no traffic data was available at the Option Identification stage, a Screening and Scoping assessment would be sufficient to highlight the differences between options, identify any risks and propose the likely level of assessment at the Preliminary Design stage.
- 3.3.7. For other topic areas, namely Landscape and Visual, Nature Conservation (now Biodiversity), Material Resources and People and Communities (now Population and Human Health), the assessment proposal from the Option Identification stage was amended to cover only the differences between the remaining two options, or to explore further issues that presented a risk to the further development of the Scheme. For example, there is little difference between options in relation to heritage but understanding the views of Historic England in relation to Bowes Railway Scheduled Monument (SM), was considered worthy of reporting. For the remaining topics, Geology and Soils and Cultural Heritage, there are no significant differences between options, and the Option Identification stage assessment was considered valid for the Option Selection stage.

- 3.3.8. The two options shortlisted at the Option Selection stage (Options 1a and 1b) were taken to non-statutory public consultation in autumn 2016 (further details are available in the Consultation Report (**Application Document Reference: TR010031/APP/5.1**)) as follows:
- a. Option 1a (previously named Option 2) “Offline Replacement of Allerdene Bridge” – Allerdene Bridge would be reconstructed south of its current location, improving the existing road alignment and improving safety. To accommodate the new alignment, it was considered that there may be a requirement to replace Smithy Lane Overbridge (refer below to ‘in text’ **Figure 3-3**).
  - b. Option 1b (previously named Option 1) “Online Replacement of Allerdene Bridge” – Allerdene Bridge would be replaced in its current location. This would require a temporary bridge to be constructed to carry traffic over the A1 while the new bridge is constructed. This option would be a more complex scheme to construct requiring more traffic management and a longer construction period (refer below to ‘in text’ **Figure 3-4**).

**Figure 3-3 - Option 1a “the Preferred Route”**



**Figure 3-4 - Option 1b**



3.3.9. At Option Selection stage the Saturn traffic model used at Option Identification stage was updated with origin-destination demand data derived from mobile phone data. The results showed an increase in flows of 21% in the southbound direction compared to previous model. As a result, the Scheme design was updated to include four lanes southbound through junction 66 (Eighton Lodge) to accommodate these predicted flows in line with guidance set out in DMRB Volume 6, Section 2, Part 1 TD 22/06 (**Ref 3.4**). The current design requires asymmetrical widening whereby the southbound carriageway is now:

- a.** North of junction 67 (Coal House) – three lanes
- b.** Through junction 67 (Coal House) – three lanes



- c. Between junction 67 (Coal House) and junction 66 (Eighton Lodge) – four lanes
- d. Between junction 66 (Eighton Lodge) and junction 65 (Birtley) – four lanes
- e. South of junction 65 (Birtley) – three lanes

3.3.10. In July 2017, a Preferred Route was announced for the Scheme. The Preferred Route is as follows:

- a. Widening from three to four lanes between junction 65 (Birtley) and junction 67 (Coal House) on the southbound carriageway.
- b. Widening three lanes with an additional lane to help manage traffic joining and leaving the A1 between junctions on the northbound carriageway.

3.3.11. The Preferred Route also retains the existing layout of junction 67 (Coal House) and allows for the offline replacement of Allerdene Bridge. The reasons for the selection of this option are set out in **Section 3.4** below.

## 3.4 JUSTIFICATION FOR CHOSEN OPTION

### CONSULTATION

3.4.1. A public non-statutory consultation event was held in autumn 2016. The following options were presented to the public and other stakeholders for comment:

- a. Option 1a – Offline Replacement of Allerdene Bridge
- b. Option 1b – Online Replacement of Allerdene Bridge

3.4.2. Scheme and environmental information was presented and expert staff were on hand to answer questions. Information was also available in written and online form and numerous questions have been addressed in writing subsequent to the events.

3.4.3. The public consultation identified that 73% of respondents preferred Option 1a. The primary reasons given for choosing Option 1a were a shorter construction period resulting in potentially less disruption and the Scheme was generally considered less complex to construct. The outcome of this consultation was reported in the Report on Public Consultation (**Ref 3.5**) produced in April 2017. The Consultation Report (**Application Document Reference: TR010031/APP/5.1**) provides an account of the non-statutory consultation held in 2016 and further statutory consultation carried out in 2018 and 2019. This includes a summary of all responses received from stakeholders, statutory bodies, land interests and members of the public during each round of consultation in accordance with section 42, 47, 48 and 49 of the Planning Act 2008.

### ENGINEERING PERSPECTIVE

3.4.4. From an engineering perspective the following provides a summary comparison between the two options:

- a. Both options have potential to affect construction employment and amenity value of recreational routes and public spaces.
- b. The quantity of earthworks, ground improvement and treatment of shallow mine works is likely to be less for Option 1b.

- c. Option 1a offers less constraints for the construction of Allerdene Bridge resulting in improved buildability - there are fewer constraints to foundation design/location, fewer modifications required to existing earthworks and increased working room.
- d. Option 1a has less risk to the construction programme as the demolition of the existing Allerdene Bridge is not on the critical path.
- e. Option 1a has reduced temporary works complexities.
- f. The overall cost/programme of the Scheme would be significantly reduced for Option 1a.
- g. Option 1a offers an improved geometrical alignment.
- h. Option 1a is a better option for road users as the speed/lane restrictions would be significantly less than Option 1b during construction.

### ECONOMIC PERSPECTIVE

3.4.5. A Benefit Cost Ratio (BCR) is an indicator, which attempts to summarise the overall value for money of a scheme. Both options had BCRs that fell into the high value for money category. There was a more favourable BCR for Option 1a as a result of the lower Scheme costs and reduced construction programme.

3.4.6. **Table 3-1** summarises the conclusions of the assessments completed at Options Selection stage and shows a comparison of Options 1a and 1b. Green indicates where an option is comparably better than the other and red shows which is worse, (but red is not an indication that an option has failed an assessment) amber shows where there is no difference between the two options.

**Table 3-1 - Comparison of the options**

ASSESSMENT	OPTION 1A	OPTION 1B
<b>Requirements</b>	Meets the requirements/objectives as set out in the Client Scheme Requirements. There would be no difference in the end produce that the options provide.	Meets the requirements/objectives as set out in the Client Scheme Requirements. There would be no difference in the end produce that the options provide.
<b>Quality</b>	Meets the quality requirements. There would be no difference in additional functionality that both options can offer.	Meets most of the quality requirements. There would be no difference in additional functionality that both options can offer.  As the demolition and replacement of Allerdene Bridge is on the critical path, construction duration is 8 months longer than option 1a and the level of impact on road users, due to the scale and nature of traffic management required is likely to be more significant than option 1a.

ASSESSMENT	OPTION 1A	OPTION 1B
<b>Cost (most likely estimate)</b>	£228,974,901	£256,149,151
<b>BCR (Core)</b>	5.07	4.59
<b>Time</b>	Start of work by March 2020 meeting RIS target. Construction duration of 36 months.	Start of work by March 2020 meeting RIS target. Construction duration of 44 months.
<b>Affordability</b>	Delivery of option is well within budget	Delivery of option is well within budget
<b>Risk Profile</b>	Medium/High Risk - can mitigate with early involvement of consultees and advanced work around structures and GI.	High Risk – can mitigate with early involvement of consultees and advanced work around structures and GI however the replacement of Allerdene Bridge is on the critical path requiring disruptive possessions.
<b>Noise</b>	Adverse	Adverse
<b>Air Quality</b>	Adverse	Adverse
<b>Greenhouse Gases</b>	Adverse	Adverse
<b>Landscape</b>	Moderate Adverse	Slight Adverse
<b>Heritage of Historic Resources</b>	Moderate Adverse	Moderate Adverse
<b>Biodiversity</b>	Moderate Adverse	Moderate Adverse
<b>Water Environment</b>	Moderate Adverse	Moderate Adverse
<b>Public Preference</b>	73% preferred this option	10% preferred this option

3.4.7. As a result of the comparison between the two options detailed in the table above the reasons for taking forward Option 1a and for discounting Option 1b are presented in **Table 3-2**.

**Table 3-2 - Justification for chosen option**

Option	Description	Reason for taking forward or discounting
<p>Option 1A - Offline Replacement of Allerdene Bridge</p>	<p>Allerdene Bridge would be reconstructed south of its current location, improving the existing road alignment and improving safety.</p>	<ul style="list-style-type: none"> <li>– It is the most cost-effective option, providing similar or greater benefits to other options, but at lower cost.</li> <li>– The non-statutory public consultation identified that 73% of respondents preferred Option 1a.</li> <li>– It has a shorter construction period resulting in potentially less disruption.</li> <li>– This option is less risk to the construction programme as the demolition of the existing Allerdene Bridge is not on the critical path.</li> <li>– It offers less constraints for the construction of Allerdene Bridge resulting in improved buildability.</li> <li>– This option has reduced temporary works complexities.</li> <li>– It offers an improved geometrical alignment.</li> <li>– This option is generally better in respect of driver stress as the speed/lane restrictions would be significantly less than Option 1b during construction.</li> </ul>
<p>Option 1B - Online Replacement of Allerdene Bridge</p>	<p>Railway Bridge would be replaced in its current location. This would require a temporary bridge to be constructed to carry traffic over the A1 while the new bridge is constructed.</p>	<ul style="list-style-type: none"> <li>– This option would be a more complex scheme to construct requiring more traffic management and a longer construction period.</li> <li>– This option is more expensive and provides least value for money.</li> </ul>

## REFERENCES

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- Ref. 3.1** Highways Agency (2015). A1 Newcastle Gateshead Western Bypass Stage 3 Report. Published February 2015.  
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- Ref. 3.2** Design Manual for Roads and Bridges (2008). Volume 11, Section 2. Part 2. HA 202/08. Environmental Impact Assessment.
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<http://www.standardsforhighways.co.uk/ha/standards/dmr/vol6/section2/td2206.pdf>
- Ref. 3.5** Highways England (2018). A1 Birtley to Coal House Consultation Report. Application Document Reference: TR010031/APP/5.1.



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