

# **A9/A96 Inshes to Smithton**

**DMRB Stage 2 Scheme Assessment Report**

**Volume 1 – Main Report and Appendices**

**Part 5 – Assessment Summary and  
Recommendation**

October 2017



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## **21. Assessment Summary**

### **21.1 Introduction**

21.1.1 This chapter summarises the main findings of this DMRB Stage 2 Scheme Assessment Report. A summary is provided of the engineering assessment (Part 2, Chapters 4-6), the environmental assessment (Part 3, Chapters 7-18) and the traffic and economic assessment (Part 4, Chapters 19-20).

### **21.2 Scheme Dependencies**

21.2.1 The scheme is interdependent with projects and plans being progressed by The Highland Council (THC) as well as being dependent on the proposed A96 Dualling Inverness to Nairn (including Nairn Bypass) scheme. The dependencies are as follows:

- All Options tie into the proposed Smithton grade separated junction, which forms part of the A96 Dualling Inverness to Nairn (including Nairn bypass) scheme, for which draft orders have been published and the statutory process is being progressed;
- All Options tie into the local road network, which is subject to ongoing capacity improvement interventions by THC (Inshes Phase 2 Project). All options have been assessed using current proposals for THC's scheme; and
- All Options pass through land to the east of the A9, which is currently subject to an ongoing development brief.

### **21.3 Engineering Assessment**

21.3.1 There are no potential impacts so significant that an option should be discounted on the basis of any individual engineering criteria and the construction activities required for the options are conventional civil engineering operations. However, a number of criteria are not without engineering challenges, such as flood mitigation north of the Highland Main Line Railway, import of fill material due to the options being on embankment and construction activity disruption on the local road network as a result of integrating the options.

21.3.2 The main features of the construction activities for the options are summarised below:

- Constructability – all Options entail the construction of a bridge over the Highland Main Line Railway. Construction of the Culloden Road Overbridge and the A9 Overbridge is necessary for Options 1 and 2. The most significant technical challenge likely to be experienced on the proposed scheme are the works required to either demolish or add a parallel structure next to the existing Inshes Overbridge. These works are associated with Options 2 and 3. Option 2 requires the demolition and replacement of Inshes overbridge and Option 3 requires the addition of a parallel structure next to the existing overbridge to accommodate provision of a dual-2-lane carriageway. Option 3 is therefore considered to impact upon feasibility to a greater extent than Option 1 but to a lesser extent than Option 2.
- Departures from Standard – anticipated Departures from Standards in all the Options relate primarily to the A9 southbound lane gain/ drop arrangement, between Raigmore Interchange and Inshes Junction. For Options 1 and 3, the proposed layout configuration of the lane gain/drop and cross-section will require a Departure from Standard. The weaving length for all Options is below the 1km desirable minimum for a rural all-purpose road as per TD 22/06. The existing diverge and connection to the local road network does not comply with current design standards due to the tight radius curve and the presence of accesses to a number of residential properties.

## **21.4 Environmental Assessment**

21.4.1 There are no potential impacts so significant that an option should be discounted on the basis of any individual environmental criteria. All of the Options have the potential for adverse and some positive impacts upon the environment.

21.4.2 The main findings of the environmental assessment are summarised as:

- Noise and Vibration – Options 1 and 2 are expected to have greater adverse noise impacts than Option 3 due to the new road alignment between Cradlehall roundabout and Inshes Retail Park. The B variants are also expected to have greater adverse noise impact than the A variants due to the proximity of the B variants to existing residential areas.
- Landscape and Visual – Options 1 and 2 have a greater impact on landscape character and visual amenity than Option 3.
- Ecology and Nature Conservation – Options 1A and 3A are predicted to have the lowest impact, all other Options result in the loss of a greater area of high value bat habitat. Options 1B, 2B and 3B would also result in the loss of a greater area of habitat used by badger.
- Road Drainage and the Water Environment – All of the Options have the potential to impact upon the water environment. However, the B variant has the potential to have a greater impact on the existing floodplain and is likely to require more extensive compensatory flood measures than the A variant.
- Cultural Heritage – Options 1A, 2A and 3A are expected to have the greatest impact on the setting of Ashton Farm Scheduled Monument as these Options sever the two scheduled areas of this asset. Options 1B, 2B and 3B have a moderate impact on the setting of the Scheduled Monument as they avoid severing the two scheduled areas however they impact the setting of this asset. Options 1 and 2 are expected to directly impact on key historic building elements of Castlehill House (Category B Listed building). Options 3A and 3B are not expected to impact this asset.
- Materials – Options 1 and 2 require the greatest volume of material import, with the B variants requiring slightly more material import than the A variant. Option 3 requires the least volume of material import.
- Community and Private Assets – Option 3 is expected to have the least impacts overall as it is not expected to result in any property demolitions and has less land-take and fewer number of land interests impacted than Options 1 and 2.

21.4.3 For air quality and geology and soils the environmental assessment concludes that the level of impact for all of the Options is broadly similar.

## **21.5 Traffic and Economic Assessment**

21.5.1 All Options reduce traffic levels on the trunk road network while facilitating access to, and accommodating traffic growth associated with, the Inverness East development proposals. All Options reduce traffic levels on the local road network through Smithton. Options 1 and 2 reduce traffic demand on Culloden Road at Inshes overbridge but increase demand on the road network in Inshes Retail Park with corresponding detrimental operational impacts. Option 3 increases demand on Culloden Road at Inshes overbridge but the widening of the overbridge provides increased capacity to mitigate the impact. As such the queues and delays under Option 3 are no worse than the do-minimum situation while accommodating increased traffic levels arising from the proposed Inverness East development.

All Options provide good value for money with Benefit to Cost Ratios (BCR) at least greater than 3.2 in the low and high growth scenarios.

## **22. Preferred Option Recommendation**

### **22.1 Introduction**

22.1.1 This chapter describes the option selection process and recommends the preferred option to be taken forward for DMRB Stage 3 assessment. The preferred option recommendation takes into account the scheme objectives and the Scottish Government's appraisal criteria, together with the findings of the DMRB Stage 2 assessment. Feedback following the exhibitions held in August 2016 has also been considered during the option assessment process.

### **22.2 Stage 2 Value for Money Workshop**

22.2.1 A Stage 2 Scheme Options Assessment Value for Money Workshop was held on 28 June 2017, facilitated by Capital Value & Risk Limited. At this workshop, the project team reported the assessment outcomes from the DMRB Stage 2 work using the Government's appraisal criteria for the assessment of trunk road schemes:

- Economy – supporting sustainable economic activity in appropriate locations and getting good value for money;
- Safety – to improve safety for all road users;
- Environment – protecting the built and natural environment;
- Integration – ensuring that all decisions are taken in the context of the integrated transport policy; and
- Accessibility and social inclusion – improving access to everyday facilities for those without a car, and reducing community severance.

22.2.2 The scheme objectives set out in Part 1, Chapter 1 (Scheme Background) of this report were considered.

22.2.3 A copy of the Stage 2 Scheme Options Assessment Value for Money Workshop Report is included as Part 6, Appendix A22.1 of this report.

22.2.4 At the option assessment workshop each option was scored against the assessment criteria as identified in the Workshop Report. The Utility Score is the overall total assessment score for each option. The Utility Score for each option divided by the estimated cost for each option provides a Value Index measure. Options with a higher Value Index score are considered to be preferable since it represents a better ratio of Utility to Cost. It should be noted that spot costs only have been used for the purposes of obtaining the value index, however in line with standard practice for this stage of assessment, cost ranges are used as set out in Chapter 3.

22.2.5 At the Workshop the Options were ranked and the ranking is shown in Table 22.1 and Table 22.2. Further details on the Value for Money Workshop assessment process and output are contained in Part 6, Appendix A22.1 of this report.

**Table 22.1 : Options Ranking**

	1A	1B	2A	2B	3A	3B
Utility	983.0	1014.0	970.0	1001.0	1024.0	1055.0
Cost £m*	35.0	37.0	43.0	46.0	25.0	27.0
Value Index	28.1	27.4	22.6	21.8	41.0	39.1
Ranking	3	4	5	6	1	2

\* Spot costs rounded to the nearest £million have been used only for the purposes of calculating the value index.

22.2.6 The workshop identified a number of actions and the actions relevant to the option assessment process were addressed as follows:

**Table 22.2 : Workshop actions and outcomes**

Workshop Action	Outcome
Conduct sensitivity test by removing EC3: Transport Economic Efficiency (TEE), this was proposed by some participants on the basis of some possible double counting.	Utility ranking order is unchanged.
Conduct sensitivity test by removing O3: Promotability	Option 1B is first, followed by Option 3B (a score difference of 11), with Option 2A being worse (having a score difference of 51 compared to Option 1B). This refers to the utility score only, the removal of O3: Promotability did not affect the value index or outcome of the VfM Workshop.
Conduct sensitivity test by adjusting the criteria weightings, making them unequal.	There would have to be a major change to these before the value ranking changed.

## 22.3 Preferred Option Assessment

22.3.1 On the basis of the DMRB Stage 2 Scheme Assessment, the outcome of the Value for Money and subsequent actions to address the workshop actions, the outcome of the option assessment process is that Option 3 is the best performing option overall and is preferred for the following reasons:

- Option 3 has an increased safety benefit over Options 1 and 2. This is due to a slight increase in vehicle kilometres travelled in Options 1 and 2. All options reduce traffic levels on key local roads within Smithton and Culloden residential area resulting in less potential conflict between vehicles and non-motorised users.
- Options 1 and 2 are expected to have greater adverse noise impacts than Option 3 due to the new road alignment between Cradlehall roundabout and Inshes Retail Park. The B variants are also expected to have greater adverse noise than the A variants due to the proximity of the B variants to existing residential areas.
- Option 3 has the least impact upon landscape character and visual amenity.
- Options 1A and 3A are predicted to have the lowest impact on ecology and nature conservation as all other options would result in the loss of a greater area of high value bat habitat. Options 1B, 2B and 3B would also result in the loss of a greater area of habitat used by badger.

- The A variant of each option is expected to have the greatest impact on the setting of Ashton Farm Scheduled Monument. The B variants of each option have a moderate impact on the setting of the Scheduled Monument. Option 3 is not expected to impact key historic building elements of Castlehill House (Category B listed building).
- Option 3 requires the least volume of material import.
- Option 3 is expected to have the least impacts overall on community and private assets as it is not expected to result in any property demolitions and has less land-take and number of land interests impacted.
- Option 3 better assists THC in its aim to encourage more active travel and sustainable transport modes by managing network capacity.

22.3.2 Option 3 performs less favourably in the following assessment areas:

- Option 3 offers the lowest reduction in traffic levels on the A96 approach to Raigmore Interchange when compared to the other Options.
- The level of journey time reduction provided by Option 3 is the lowest of the three Options.
- Although the results for each of the Options are all considered to provide a very high value for money, Option 3 has the lowest overall Present Value of Benefits and Net Present Value levels.
- Options 1 and 2 provide direct access into the Inshes area which benefits active travel users and public transport with an additional means of access between Inverness East and Inverness South. Option 3 does not provide the same direct access into the Inshes area.
- Options 1 and 2 provide an additional crossing over the A9 and therefore provide further operational resilience than Option 3.

22.3.3 The above will be considered further during the DMRB Stage 3 assessment, to seek to reduce the potential impact of the scheme, through further design development supported by the ongoing EIA process, and stakeholder, public and landowner consultation, including development of appropriate mitigation measures.

## **22.4 DMRB Stage 2 Preferred Option Recommendation**

22.4.1 On the basis of the DMRB Stage 2 Scheme Assessment, the outcome of the Value for Money Workshop and subsequent work to address the workshop actions it is recommended that Option 3 is taken forward as the preferred option for the A9/A96 Inshes to Smithton scheme.

22.4.2 With respect to the comparing the A and B variants, it is evident that the road will form an important element of THC's masterplan for Inverness East. As these plans are currently in development it is considered appropriate not to be definite at this stage with regard to the finalisation of the assessment of the A and B variants. This will allow integration with masterplan proposals to be better considered, alongside all other assessment criteria. It will also allow, where appropriate, the refinement of the alignment, junction location and layout, local roads and private means of access to be progressed at DMRB Stage 3, and taking into consideration input from consultation bodies such as Historic Environment Scotland regarding the impacts on Ashton Farm Scheduled monument. It will include development of suitable mitigation measures to reduce impacts on the environment, for example: appropriate construction management plans; mammal (e.g. badger and other) underpasses, ledges and fences; landscape planting, and noise barriers or environmental bunds.

22.4.3 The design development of the preferred option will be informed by consultation with affected parties, statutory bodies, Community Councils and other relevant interest groups.

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