

## 3 Alternatives Considered

### 3.1 Introduction

3.1.1 This chapter summarises the alternative strategic options considered at PES and SEA stage (Transport Scotland, 2013), the preliminary sifting and screening of potential DMRB Stage 2 mainline route alignments and grade separated junction options, and then the resulting DMRB Stage 2 assessment of the retained potential mainline route and grade separated junction options (Jacobs, 2016). In addition, this chapter also includes a summary of additional eastern offline options assessed during DMRB Stage 2.

3.1.2 The proposed scheme for Tay Crossing to Ballinluig as assessed in this DMRB Stage 3 ES comprises online (southbound) widening of the existing A9 and provision of an overbridge providing connectivity to the northbound carriageway for the settlements of Dowally, Guay and Kindallachan. This is a result of decisions made following consideration of a range of alternative alignment options.

### 3.2 SEA Stage Considerations

3.2.1 The A9 PES and A9 SEA, which provided an equivalent assessment to the DMRB Stage 1 level of consideration for the A9 Dualling Programme, considered three high-level, strategic alternative dualling options, as summarised in Table 3.1.

**Table 3.1: Strategic Level Alternative Dualling Options**

Strategic Option	Description
Online Widening	Dualling along the existing A9 single carriageway sections, to tie in with the existing dualled sections
Online Widening & Offline Dualling	Dualling along the existing A9 route, with localised offline dualling where constraints dictated
Alternative route(s)	Dualling via alternative routes to the existing A9.

3.2.2 Offline dualling to the west of the Highland Main Line railway from the Tay Crossing and with a tie-in at Ballinluig (known as the Back Route) was considered as one of the strategic options. The studies identified that offline widening would result in significant loss of ancient woodland, floodplain and potentially significant landscape and visual impacts. The offline option would also result in impacts on Inchmagrannachan and Dalguise associated with the proximity and height of the route as it passes these communities. Therefore, online widening, generally following the route of the existing A9, was identified as the most suitable option. The online dualling corridor was identified as a 200m wide corridor centred on the existing A9 that could be extended locally, depending on constraints encountered at later design development and environmental assessment stages. Additionally, a number of locations were identified where further consideration of localised offline sections should take place.

3.2.3 The online widening recommendation, with localised offline sections, was consistent with the topographical, environmental and physical constraints around the existing A9, including designated sites. It was on this basis that development of mainline alignment and junction options for the DMRB Stage 2 assessment was progressed. Plans illustrating the online widening options for Tay Crossing to Ballinluig developed prior to initial sifting exercises and subsequent DMRB Stage 2 assessment, are available on Transport Scotland’s website (Transport Scotland, 2014).

### 3.3 Sifting of Preliminary Mainline Alignments

#### Overview

3.3.1 Within the online widening corridor identified in the A9 PES and SEA there were many potential alignments that could theoretically be taken forward. Early in the DMRB Stage 2 process, these were reduced to a subset of route options that could then be subject to design development and further assessment.

- 3.3.2 During the DMRB Stage 2 process, a review of the A9 PES and SEA assessments enabled the identification of potential mainline alignment options. A preliminary engineering design was then developed for each of these alternatives, applying a standard road cross-section and earthworks slope gradients, informed by available topographical survey information.
- 3.3.3 A number of sub-option alternatives were developed for various sections of the mainline alignments, and subject to high-level assessment against environmental constraints, engineering and economic criteria. Environmental constraints considered comprised:
- community and private assets: land-take, property demolition, and development sites;
  - geology, soils and groundwater: geological Site of Special Scientific Interest (SSSI), Geological Conservation Review (GCR) sites and known contaminated land sites;
  - road drainage and the water environment: watercourse crossings and SEPA 1:200-year flood extents;
  - ecology and nature conservation: ecological designations comprising Special Areas of Conservation (SAC), SSSI, designated woodland (Ancient Woodland Inventory and National Woodland Survey of Scotland) and protected species;
  - landscape and visual: landscape designations and character areas, landscape elements, visual receptors;
  - cultural heritage: Scheduled Monuments, Listed Buildings, Battlefields, Conservation Areas and Gardens and Designed Landscapes;
  - air quality and noise and vibration: distance to receptors; and
  - effects on all travellers: impacts on Core Paths, Local Paths, Rights of Way and National Cycle Routes.
- 3.3.4 The sifting process involved a negative assessment of the options identified and generally was based on a qualitative description of the likely impacts. Where available, quantitative information was included and the assessment broadly considered the relative size and scale of impacts of each option. The negative assessment involved a high level assessment of impacts so as to determine which particular options could be removed due to them being significantly less advantageous than the other competing options that remain available. The appraisal was based on all available data at that time, which in the context of environmental assessment included:
- initial desk-based review of existing information (including SEA and related documents);
  - Phase 1 habitat maps and target notes;
  - watercourse crossing survey photos and report; and
  - initial input from consultees via Environmental Steering Group (ESG).
- 3.3.5 Throughout this ES, references are made to chainage (shortened to 'ch', for example ch1500), which is a reference to the number of metres from the starting point of the proposed scheme, from south to north. The proposed scheme was initially reported as commencing at ch600 (later revised at DMRB Stage 3 to ch0). There may be minor improvement works to the existing carriageway south of this starting point; however, this does not form part of the proposed scheme or DMRB Stage 3 assessment.

### **DMRB Stage 2 Mainline Sifting Outcomes**

- 3.3.6 The results of the sifting assessment are described below. These results were reviewed by Jacobs' project team (engineering design and environmental) and Transport Scotland in a sifting assessment workshop in February 2015, the key outcomes of which are described below.

Sifting Options Considered

- 3.3.7 To facilitate further sifting of northbound and/or southbound widening options, the route was considered as four sub-option sections to allow a combination of two or more of the simple mainline options. These sections were:
- Section 1 - ch600 to ch1260;
  - Section 2 - ch1260 to ch4690;
  - Section 3 - ch4690 to ch5870; and
  - Section 4 - ch5870 to ch8940.
- 3.3.8 The review of the 'simple' mainline options produced during the DMRB Stage 1 by the PES/SEA assessment were as follows:
- Option A - Parallel widening of the carriageway northbound;
  - Option B - Parallel widening of the carriageway southbound;
  - Option C - Symmetrical widening of the carriageway;
  - Option D - Localised offline widening within the vicinity of West Haugh of Tulliemet, Haugh Cottages and Haugh of Kilmorich; and
  - Option E - Localised offline widening within the vicinity of Kindallachan.

Key Sifting Considerations

- 3.3.9 Due to a need to keep the existing A9 open during construction and complications associated with widening existing structures, plus proximity to the Highland Main Line railway, symmetrical widening (Option C) in general was discounted. Option D was also discounted at this stage due to potential impacts on the floodplain.
- 3.3.10 One of the most constrained sections was between Guay and Kindallachan due to the combination of constraints imposed by the Highland Main Line railway and environmental features including the Kindallachan, cairn Scheduled Monument (Asset 221), Kindallachan, standing stone Scheduled Monument (Asset 225) and Guay Farmhouse (Category B Listed Building). After discounting Option C as explained in paragraph 3.3.10, two remaining online options (Option A and B) plus a localised offline option (Option E) were considered through the sifting assessment.
- 3.3.11 Northbound widening (Option A) was identified as being significantly less advantageous than the southbound widening option (Option B) due to proximity to the Highland Main Line railway. The localised offline option (Option E) was identified as being significantly less advantageous than the southbound widening option due to the volume of earthworks required (surplus of 790,000m<sup>3</sup>), overall land-take of 20ha, severance and loss of native and ancient woodland (13.5ha), and landscape/visual impacts (Tayside Lower Highland Glens Landscape Character Area; severance and loss of woodland; and views of earthworks from properties, paths, roads and the Highland Main Line railway).
- 3.3.12 It was determined that symmetrical and northbound options could not be progressed due to the constraint of the Highland Main Line railway, and the localised offline option was discounted due to potential significant impacts as noted above. Consequently, all four mainline options that progressed to the DMRB Stage 2 assessment included southbound widening between Guay and Kindallachan.
- 3.3.13 Whilst it was recognised that there would be greater potential for impacts on the Kindallachan, cairn Scheduled Monument, Kindallachan, standing stone Scheduled Monument and Guay Farmhouse (Category B Listed Building) for southbound mainline widening (Option B) than the discounted northbound, symmetrical or localised alignment (Option A, C and E), this was considered unavoidable due to the stated constraints and limits explained above.

### Sifting Outcomes

- 3.3.14 The outcome of these considerations was to define 14 sub-option sections, which were then assessed against topographical constraints, engineering constraints, and the environmental constraints listed in paragraph 3.3.3.
- 3.3.15 The outcome of this assessment was a series of recommendations outlining the sections in which dualling should be considered on either the northbound or southbound carriageways of the existing route (or hybrid of both), to avoid significant constraints.
- 3.3.16 The recommendations and sub-options were then reviewed in a sifting assessment workshop in February 2015. Additionally, the potential impacts on Kindallachan, cairn and Kindallachan, standing stone were presented along with other cross project design considerations to the ESG in May 2015. The potential impacts on these scheduled monuments were presented as unavoidable and ESG members were able to provide comment on the proposal.
- 3.3.17 Four full length options (Options 1, 2, 3 and 4) were progressed to the formal DMRB Stage 2 assessment process reported via the Jacobs (2015) Report, A9 Dualling: Tay Crossing to Ballinluig, Sifting of Indicative Route Options Report. The mainline options are described further in Section 3.5 DMRB Stage 2 Assessment of Route Options and further development of the scheme design during DMRB Stage 3 is detailed in Chapter 4 (Iterative Design Development).

## **3.4 Sifting of Tier 2 Side Road Options**

### **Overview**

- 3.4.1 Following the identification of the mainline route options for Tay Crossing to Ballinluig, a number of alternative access options were developed and sifted. 'Tier 2' accesses are those relating to C-classified roads or unclassified roads, and 'Tier 3' accesses are those relating to private or agricultural roads.
- 3.4.2 A Junction and Access Strategy, developed during DMRB Stage 1 as part of the PES/SEA assessment, identified options for Tier 2 accesses, including the existing junction arrangement of the Rotmell - Dunkeld (C502) Road. As the alternative side road connections can be linked together, a number of Tier 3 accesses were considered likely to be affected and therefore were considered and assessed along with the Tier 2 side roads.
- 3.4.3 This confirmed that a combination of alternative access provision and left-in left-out junctions should be considered and the Tier 2 side road options were developed on this basis.

### **Tier 2 Side Road Options Sifting Outcomes**

- 3.4.4 To determine the options to be taken forward to DMRB Stage 2 assessment, the Tier 2 side road options were assessed in accordance with the Tier 2 side road sifting Methodology. For the purposes of the side road sifting assessment and due to the similarity of the mainline options all side road options were designed in relation to only one mainline option – mainline route Option 4:
- Option 1 – Dowally Access – Side Roads A and B
  - Option 2 – Dowally Access – Side Roads A and C
  - Option 3 – Dowally Access – Side Roads E and B
  - Option 4 – Dowally Access – Side Roads E and D
  - Option 5 – Dowally Access – Side Roads B and G
  - Option 6 – Dowally Access – Side Roads D and G
  - Option 7 – Guay/Kindallachan – Side Roads H and I
  - Option 8 – Guay/Kindallachan – Side Roads H and J

- Option 9 – Guay/Kindallachan – Side Roads H and K
- Option 10 – Guay/Kindallachan – Side Roads F and I
- Option 11 – Guay/Kindallachan – Side Roads F and J
- Option 12 – Guay/Kindallachan – Side Roads F and K
- Option 13 – Guay/Kindallachan – Side Road H
- Option 14 – Haugh of Kilmorich – Inch Farm – Side Road L
- Option 15 – Haugh of Kilmorich – Inch Farm – Side Road M

3.4.5 Each Tier 2 side road option was then assessed following the same environmental criteria as the mainline sifting process. Additional engineering criteria such as length and local routes were also considered in addition to the mainline sifting engineering criteria. The options were then reviewed in a sifting assessment workshop in November 2015; ten of the options were subsequently sifted out and two additional options were identified, assessed and subsequently sifted-out. Five side road options were retained and combined to provide four side road options. All four side road options included the same tie in to the existing side road network in proximity to the Kindallachan Cairn Scheduled Monument and did not encroach on the Kindallachan Cairn Scheduled Monument designated area.

3.4.6 The sifting of the Tier 2 accesses has been recorded via the Jacobs (2015b) Report 'A9 Dualling: Tay Crossing to Ballinluig – DMRB Stage 2 Scheme Assessment Sifting of Indicative Tier 2 Side Road Options Summary Report'.

3.4.7 Considering the side road options, a total of 16 mainline and side road route options emerged from this DMRB Stage 1 sifting assessment. These options remained available for further consideration at DMRB Stage 2 Assessment:

- Mainline Option 1 with Side Road Option 1, 2, 3 or 4;
- Mainline Option 2 with Side Road Option 1, 2, 3 or 4;
- Mainline Option 3 with Side Road Option 1, 2, 3 or 4; and
- Mainline Option 4 with Side Road Option 1, 2, 3 or 4.

### **3.5 DMRB Stage 2 Assessment of Route Options**

3.5.1 DMRB Stage 2 seeks to identify factors including: environmental, engineering, economic and traffic advantages, disadvantages and constraints associated with selected route options. This section summarises the DMRB Stage 2 process for Tay Crossing to Ballinluig.

3.5.2 The DMRB Stage 2 assessment process included desk-based assessment, site surveys, public consultation, and input from a range of statutory and non-statutory consultees and stakeholders. Public consultation was undertaken, including public exhibitions presenting the route options and the potential impacts these would be likely to have on the environment. Feedback on the options and information on the local area obtained from these community engagement events was taken into consideration during the development of the DMRB Stage 2 options and, ultimately, in the selection of a preferred route option.

3.5.3 As part of the DMRB Stage 2 assessment process, Value for Money and Preferred Route Workshops were also held with the project team and Transport Scotland to inform selection of a preferred route option to be taken forward to DMRB Stage 3.

3.5.4 As set out in paragraph 3.4.4, a total of 16 options were identified and evaluated at DMRB Stage 2 for this 7.7km section of the A9. The route options and side roads considered are shown on Figures 3.1 - 3.4 and summarised below.

**Mainline Route Options 1-4**

3.5.5 Mainline Route Options 1-4 all followed the general line of the existing A9, but varied in terms of whether the dualling would be provided by widening to the northbound side or southbound side. Two of the sections (ch600-4000 and ch5200-7500) are the same for all route options. In terms of alignment, the routes can be considered in four sections, as set out in Table 3.2.

**Table 3.2: DMRB Stage 2 Proposed Mainline Route Option Alignments**

Chainage (ch)	Option 1	Option 2	Option 3	Option 4
ch600 (start of project) to ch4000 Dowally	Southbound Widening (common to all options) Left-in/left-out Junction at location of existing C502 Dunkeld to Rotmell road access (common to all options)			
ch4000 to ch5200 Dowally - Guay	Northbound Widening with best-fit alignment through Dowally	Southbound Widening with best-fit alignment through Dowally	Southbound Widening with best-fit alignment through Dowally	Northbound Widening with best-fit alignment through Dowally
	New side road crossing over Dowally Burn New side road through Guay.			
ch5200 to ch7500 Guay – Haugh Cottages	Southbound Widening (Common to all options) New side road connecting to left-in/left-out junction (Common to all options) New side road and bridge over A9, connecting to left-in/left-out junction (Side Road Options 1 & 2 only)			
ch7500 to ch8375 (end of project)	Southbound Widening	Southbound Widening	Northbound and Southbound Widening	Northbound and Southbound Widening
	New parallel side road			

**Side Road Options 1-4**

3.5.6 Works to side roads and provision of replacement access to surrounding properties and premises would usually be developed as part of the DMRB Stage 3 design of the preferred route. However, due to the potential complexity of connecting the existing local road network and providing access to properties, side roads/side road connections have been included in the assessment at DMRB Stage 2.

3.5.7 Each of the four mainline route options included a potential side road arrangement/design, referred to as Side Road Option 1. Three alternative side road layouts were also considered (Side Road Options 2, 3 and 4) with the potential to be taken forward to DMRB Stage 3 with any of the route options.

3.5.8 The effects of Side Road Options 2 – 4 were assessed in terms of how their impacts differed from those presented for the proposed route options with Side Road Option 1, and also how they differed from each other.

**Additional Flooding Assessment**

3.5.9 Due to the potential for impacts relating to flooding and following consultation with SEPA, SNH and members of the public regarding the mainline and side road route options encroaching existing floodplain, a study and review of potential flood mitigation measures to resolve this issue was undertaken, which included the following measures:

- Design Refinement to the side roads such as:
  - Relocating the side road overbridge (Side Road Option 1 and 2 only);
  - An additional left-in left-out junction;
  - Reducing the area of new access roads;
  - Modifying the level of side roads;
  - Replacement of the approach embankment of the side road overbridge with a viaduct;
- Refinement of Slopes and retaining walls; and

- Compensatory flood storage.

- 3.5.10 The consideration and assessment of the above measures is presented in a 'Flood Mitigation Summary Paper' (Jacobs, 2016c), which determined that flooding impacts could be mitigated utilising a combination of the above measures, and which would be further advanced during the DMRB Stage 3 assessment. In particular, these would include design refinements to the side roads involving a combination of relocating the overbridge, an additional left-in left-out junction, and reducing the length of new side roads to significantly reduce floodplain encroachment.
- 3.5.11 A comparative assessment was undertaken between the revised overbridge and associated junction location and the original overbridge and associated junction location identified in the DMRB Stage 2 Report. This assessment concluded that the revised location was preferable due to its reduced impact on the existing floodplain. Therefore, if Side Road Option 1 or 2 were to be identified as the preferred side road option, the alternative overbridge would be adopted within the DMRB Stage 3 design and considered further as part of that work.

#### **Proposed Dunkeld – Rotmell (C502) Road Junction Option**

- 3.5.12 The proposed junction was included in the locality of the existing Dunkeld - Rotmell (C502) Road Junction and applied to all of the proposed route options.
- 3.5.13 This junction design consists of a left-in left-out junction with both diverge and merge tapers provided in order to allow access to and from the proposed junction. In addition, there is a requirement to realign a short section of the existing C502 in order to improve the standard of the existing side road on approach to the junction.

#### **Offline Options**

- 3.5.14 During the consultation on the mainline route options and side road options, members of the local community raised concerns over the online mainline route options. These concerns included the proximity of the dual carriageway and access roads, safety, and perceived impact of road noise and vibration on residential receptors, air pollution, and increased flood risk due to loss of River Tay floodplain. An alternative offline alignment was suggested with the alignment located to the east of the communities of Dowally, Guay and Kindallachan. Two route options containing significant offline components were subsequently developed and these are shown on Figure 3.5.
- 3.5.15 Assessment of the offline route options was undertaken to an appropriate level to inform a comparison between online and offline route options. This is detailed in the Tay Crossing to Ballinluig Online v Offline Route Option Comparative Assessment Report (Jacobs, 2016).

#### **DMRB Stage 2 Findings**

- 3.5.16 Through the DMRB Stage 2 process, Mainline Route Option 2 Side Road Option 2 was selected as the preferred route option to be taken forward to DMRB Stage 3. A brief summary of the decision process taking into account engineering, environmental and traffic and economic consideration is provided in the following paragraphs.
- 3.5.17 To recommend an overall preferred option for the project, three recommendations between the different options were made. These were:
- Recommendation 1 – Online vs Offline;
  - Recommendation 2 – Mainline Option 2 vs Mainline Options 1, 3 and 4; and
  - Recommendation 3 – Side Road Option 2 vs Side Road Options 1, 3 and 4.

Recommendation 1

*Engineering*

- 3.5.18 From an engineering perspective, the offline route options required the construction of two grade separated crossings to accommodate the retention of NMU connectivity, which are not required with the online route options. Furthermore, the offline route options required the construction of three significant new structures (Dowally – 66m span, Guay – 140m span and Kindallachan – 260m span) and a larger retaining wall (Offline Route Option 2 only), which are not required for the online route options.
- 3.5.19 Although the number of interfaces with public utilities associated with the offline route options would be less when compared with the online route options, there would be more difficulties associated with the construction of the structures on the offline route options and the extensive earthworks that are required.

*Environmental*

- 3.5.20 From an environmental perspective, the offline route options required greater land-take than the online route options combined with severance of farms, fields and forestry compartments. A greater number of property demolitions are also required including an uninhabited residential property and a number of poly-tunnels associated with a market garden and landscaping business.
- 3.5.21 Both the online and the offline route options would result in permanent impacts on the River Tay SAC designated area. However, the offline route options would have the potential to result in more impacts, with some being of a greater magnitude than online route options, due to severance and fragmentation of habitats.
- 3.5.22 The offline route options were assessed to have substantially greater landscape and visual impacts than the online options, due to the alignment deviating offline and away from the existing established transport corridor at the edge of the flat valley floor, to the relatively unspoiled and tranquil undulating higher ground of the valley slopes. The offline route options would have substantial adverse impact on landscape character and on numerous visual receptors, including residents of properties that currently have no visibility of the existing A9 when compared to the online route options. These impacts would be greatest along the offline section and associated with three prominent elevated bridge structures with effective mitigation not achievable which are not required for the online route options.
- 3.5.23 In relation to noise and vibration, the offline route options would have more adverse impacts on dwellings than the online route options. The offline route options would increase noise and vibration impacts at properties more remote from the existing A9 and that only currently experience low levels of noise from the existing side road network and A9.
- 3.5.24 The offline route options would result in more disposal of surplus material due to an increase in earthworks required to construct the offline route options compared to the online route options. There is also an increased materials impact due to the need to construct three significant structures and a larger retaining wall (Offline Route Option 2 only) and an increased need to demolish properties, which are not required for the online route options.
- 3.5.25 The offline route options pose policy non-compliance issues with more environmental parameters: community and private assets, ecology and nature conservation, and cultural heritage compared to cultural heritage only for the online route options.
- 3.5.26 The assessment identified that the offline route options would have some benefits in comparison to the online options. In relation to flood risk, the offline options would encroach less into the River Tay 1 in 200 year functional floodplain resulting in an overall lower loss of flood storage when compared to the online route options. In addition, the offline route options would avoid impacts on the Kindallachan, cairn and Kindallachan, standing stone Scheduled Monuments.



*Overall*

- 3.5.27 The range of costs for the offline route options was considerably greater than the range of costs for the online route options as they would require construction of three significant bridge structures.
- 3.5.28 Based on the assessment undertaken, it was recommended that the offline route options were not progressed for further consideration as the benefits of the offline route options as noted in paragraphs 3.5.26 are outweighed by the dis-benefits outlined in paragraphs 3.5.18 to 3.5.25. The online route options were therefore identified as being preferred.

Recommendation 2

*Engineering*

- 3.5.29 From an engineering perspective, there were some differences between mainline route options in terms of alignment, NMUs, geotechnics and earthworks and public utilities however these were not considered significant differentiators. The only significant engineering differentiator was in relation to constructability of Mainline Route Option 4 which required three traffic management crossovers compared to none for Mainline Route Option 2 as it entails southbound widening for its full length.

*Environmental*

- 3.5.30 From an environmental perspective, some differences between mainline route options were identified in terms of: community and private assets; all travellers; geology, soils and groundwater; ecology and nature conservation (including potential impacts on the River Tay SAC and ancient woodland); visual; cultural heritage (including potential impacts on Scheduled Monuments); air quality; noise and vibration; materials; and policies, and plans. However, these were not considered to be significant differentiators.
- 3.5.31 Significant environmental differentiators were identified between mainline route options in relation to road drainage and the water environment and in terms of landscape.
- 3.5.32 Mainline Route Option 4 would have the highest interaction with the baseline flood extents and Mainline Route Option 2 would have the lowest interaction. Taking into consideration the proposed mitigation measures for flood risk and other attributes of the water environment for Mainline Route Option 2, impacts would be expected to be mitigated during the DMRB Stage 3 design development for all side road options (refer to paragraphs 3.5.9 to 3.5.11).
- 3.5.33 Mainline Route Options 1, 2 and 3 were assessed to have a Moderate impact on the Lower Highlands Glen Landscape Character Area (LCA), and Mainline Route Option 4 was assessed as having no significant impacts. Between Dowally and Guay, Mainline Route Options 2 and 3 would result in a greater loss of agricultural fields and roadside trees (also designated Ancient Woodland) in comparison to Mainline Route Option 1 and 4.

*Overall*

- 3.5.34 Given the above significant differentiators, Mainline Route Option 2 was identified as being preferred to Mainline Route Options 1, 3 and 4. It was recommended that Mainline Route Options 1, 3 and 4 were therefore removed from further consideration.

Recommendation 3

*Engineering*

- 3.5.35 From an engineering perspective, there are some differences between side road options in terms of NMUs, Geotechnics and Earthworks and Public Utilities. However, these were not considered significant differentiators. Significant engineering differentiators were identified with respect to the requirement for an overbridge for Side Road Options 1 and 2 and long diversion times associated with Side Road Options 3 and 4 as access would only be provided to one carriageway. The long diversion times were considered to be a significant differentiator between the side road options.

*Environmental*

- 3.5.36 From an environmental perspective, differences in terms of community and private assets, geology, soils and groundwater, ecology and nature conservation, cultural heritage, air quality, noise and vibration, effects on all travellers (non-motorised users), materials and policies and plans were identified but these differences were not considered to be significant differentiators between side road options.
- 3.5.37 Significant environmental differentiators between side road options were identified for landscape, visual, view from the road and road drainage and the water environment.
- 3.5.38 The inclusion of the overbridge associated with Side Road Options 1 and 2 would result in a greater landscape impact than Side Road Options 3 and 4, arising from the presence of the structure and a greater loss of farmland. Side Road Options 2 and 4 would require greater loss of Ancient Woodland habitat between Dowally and Guay than Side Road Options 1 and 3.
- 3.5.39 Side Road Option 3 in combination with Mainline Route Option 4 was assessed as having the lowest overall visual impact, with Side Road Option 2 in combination with Mainline Route Option 2 having the highest visual impact due to the additional side road tie in at Guay and the visually prominent overbridge.
- 3.5.40 Side Road Options 1 and 2 were assessed as having the greatest overall impact on views from the road, due to the side road overbridge. Side Road Option 3 was assessed as having the lowest impact as it did not include the overbridge and it did not have the additional side road tie in at Guay associated with Side Road Option 4.
- 3.5.41 In terms of road drainage and water environment, potentially significant impacts were anticipated on all attributes of the water environment pre-mitigation. Specifically, in terms of flood risk, Side Road Options 1 and 2 would have the highest interaction with the baseline flood extents and Side Road Options 3 and 4 would have the lowest interaction.

*Overall*

- 3.5.42 As a result of the above significant differentiators, Side Road Option 2 was identified as being preferred to Side Road Options 1, 3 and 4 and consequently Side Road Option 1, 3 and 4 were removed from further consideration.
- 3.5.43 It was recommended that Side Road Option 2 was progressed but with an alternative overbridge arrangement, additional left-in left-out junction and reduced length of access road (to House of Bruar Warehouse), as identified in paragraph 3.5.11.

Emerging Preferred Route Recommendation

- 3.5.44 Based on the above decision making process, the recommended emerging preferred route option was Mainline Route Option 2 with Side Road Option 2. This is illustrated on Figure 3.6

## **3.6 Development of the Proposed Scheme Design**

- 3.6.1 On the basis of the Tay Crossing to Ballinluig DMRB Stage 2 assessment and the outcome of the recommendations agreed at the Preferred Route Workshop, Mainline Route Option 2 Side Road Option 2 was taken forward as the preferred route for the DMRB Stage 3 assessment.
- 3.6.2 During the DMRB Stage 3 assessment, the preferred route for Tay Crossing to Ballinluig was subject to further refinement as more detailed survey information was gathered. The DMRB Stage 3 provided enhancements to the mainline, junction and side road designs as presented in the DMRB Stage 2 Report, as well as additional flood modelling and consideration of an alternative overbridge location. The DMRB Stage 3 assessment also included the development of access tracks and accommodation works, drainage and earthworks design, and the incorporation of environmental mitigation to avoid or reduce potential impacts on the environment.

- 3.6.3 The development and design of the Tay Crossing to Ballinluig scheme within DMRB Stage 3 assessment is described in Chapter 4 (Iterative Design Development) and Chapter 5 (The Proposed Scheme).

### **3.7 References**

Jacobs (2015) *(on behalf of Transport Scotland)*. A9 Dualling: Tay Crossing to Ballinluig, Sifting of Indicative Route Options Report

Jacobs (2015b) *(on behalf of Transport Scotland)*. A9 Dualling: Tay Crossing to Ballinluig, Sifting of Indicative Tier 2 Side Road Options Summary Report

Jacobs (2016) *(on behalf of Transport Scotland)*. Tay Crossing to Ballinluig Online v Offline Route Option Comparative Assessment Report

Jacobs (2016b) *(on behalf of Transport Scotland)*. A9 Dualling Programme: Tay Crossing to Ballinluig – DMRB Stage 2 Scheme Assessment Report

Jacobs (2016c). Flood Mitigation Summary Paper

Transport Scotland (2013). A9 Dualling: Strategic Environmental Assessment (SEA)

Transport Scotland (2014). DMRB Stage 1 Assessment. A9 Dualling: Preliminary Engineering Support Services (PES)