

### 3 Alternatives Considered

#### 3.1 Introduction

- 3.1.1 This chapter summarises the alternative strategic options considered at SEA (Transport Scotland, 2013) and PES (Transport Scotland, 2014) stage, 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). Chapter 4 (Iterative Design Development) provides an overview of the iterative design process, and sets out the key environmental constraints and considerations that informed the DMRB Stage 3 design.
- 3.1.2 The proposed scheme runs from Killiecrankie to Glen Garry. At DMRB Stage 2 this section of the A9 was considered as two separate projects; Killiecrankie to Pitagowan, and Pitagowan to Glen Garry. Where relevant, this chapter therefore splits summaries of alternatives considered into these two projects.

#### 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 The studies identified that online widening, generally following the route of the existing A9, was the most suitable option. Online widening 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 and DMRB Stage 3 assessments was progressed. Plans illustrating the online widening options for the now combined Killiecrankie to Pitagowan and Pitagowan to Glen Garry sections, 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 For each of the two DMRB Stage 2 projects, 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 current dualling design standards and constraints. Environmental constraints considered comprised:
- Community & Private Assets: land-take, property demolition, and development sites;
  - Geology, Soils, Contaminated Land 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 (Special Areas of Conservation; SAC, SSSI), designated woodland (Ancient Woodland Inventory and National Woodland Survey of Scotland) and protected species;
  - Landscape & 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 & 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 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 commences at ch700 (from ch0-700 there may be minor improvement works to the existing dual carriageway, which do not form part of the proposed scheme or DMRB Stage 3 assessment).

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

- 3.3.5 The results of the mainline 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 (covering both the Killiecrankie to Pitagowan section and the Pitagowan to Glen Garry section) in February 2015.

- 3.3.6 The key outcomes of the sifting process are described below.

#### Killiecrankie to Pitagowan

- 3.3.7 The review of the 'simple' mainline options produced during the DMRB Stage 1 by the A9 PES and SEA assessments 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; and
  - Option D – localised offline curve straightening within the vicinity of the curves approaching the Pitaldonich Underbridge.
- 3.3.8 To facilitate further sifting of northbound and/or southbound widening options, the route was considered as four sub-option sections (ch700-3900, ch3900-5800, ch5800-8300 and ch8300 to end) to allow a combination of two or more of the simple mainline options.
- 3.3.9 Due to a need to keep the existing A9 open during construction and complications associated with widening existing structures, symmetrical widening (Option C) in general was discounted. In addition, offline widening to straighten curves on approach to Pitaldonich underbridge (Option D) was discounted due to potential impacts on the River Tay SAC and Aldclune and Invervack Meadows SSSI. The number of transitions between northbound and southbound widening was also carefully

considered. These considerations meant that the indicative options taken through DMRB Stage 2 would predominantly consist of only northbound and/or southbound widening.

- 3.3.10 The outcome of these considerations was to define 13 sub-option sections, which were then assessed against topographical constraints and the environmental constraints listed in paragraph 3.3.3.
- 3.3.11 Further assessment work thereafter concluded that of the 13 sub-options, seven were considerably less advantageous and were consequently sifted out of the assessment. Due to the proximity to River Tay SAC, Aldclune and Invervack Meadows SSSI and the property at Garrybank on the southbound side of the A9, only northbound widening was considered between ch5760-11000 (Table 3.2). This meant the six remaining sub-options were combined to form four alternative full length mainline options, which were taken forward for further consideration in the DMRB Stage 2 assessment and were presented via public exhibitions held on 27 and 28 May 2015. These options were named as Options 1, 2, 3 and 4, and are described further in Section 3.5 (DMRB Stage 2 Assessment of Route Options) of this chapter.

#### Pitagowan to Glen Garry

- 3.3.12 The review of the 'simple' mainline options produced during the DMRB Stage 1 by the A9 PES and SEA assessments 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; and
  - Option D – localised offline widening within the vicinity of the existing at-grade junction at Bruar/Calvine.
- 3.3.13 Similar to the Killiecrankie to Pitagowan section, the route was then considered as four sub-option sections (ch0-1500, ch1500-4000, ch4000-8000 and ch8000 to end) to allow a combination of two or more of the simple mainline options.
- 3.3.14 Similar to the Killiecrankie to Pitagowan section, symmetrical widening (Option C) in general was discounted due to a need to keep the existing A9 open during construction and complications associated with widening existing structures. The number of transitions from northbound to southbound widening) was again carefully considered.
- 3.3.15 The sifting workshop gave further consideration to the length of the A9 through Calvine, and as a result an additional sub-option was identified and subject to the same appraisal as the four sub-option sections. This sub-option reduced the extent of widening both northbound and southbound to avoid demolition or land-take associated with properties adjacent to the existing A9. At a subsequent meeting, it was agreed that this sub-option should be taken forward as a 'best fit' alignment in this relatively constrained section, rather than any of Options A to C.
- 3.3.16 The outcome of these considerations was to define 14 sub-option sections, which were assessed against topographical constraints and the environmental constraints listed in paragraph 3.3.3.
- 3.3.17 Further assessment work thereafter concluded that of the 14 sub-options, eight were considerably less advantageous and were consequently sifted out of the assessment. Due to constraints such as the properties at Calvine and to avoid impacts on the existing Pitagowan Rail Underbridge only the 'best fit' alignment (northbound transitioning to southbound) was considered between ch1600-4000. This transitioned to northbound widening between ch4000-8000 to reduce the footprint within SSSI and GCR sites, areas of Ancient Woodland and to avoid impacts on existing watercourse structures (Allt A'Chrombaidh Underbridge and Clunes Burn Underbridge). Therefore, the remaining six sub-options were combined to form four full length mainline options, which were taken forward for further consideration in the DMRB Stage 2 assessment and were also presented via public exhibitions held on 2-3 June 2015. These options were named as Options 1, 2, 3 and 4, and are described further in Section 3.5 (DMRB Stage 2 Assessment of Route Options) of this chapter.

## **3.4 Sifting of Preliminary Junction Layouts**

### **Overview**

- 3.4.1 Following the identification of the mainline route options between Killiecrankie to Pitagowan and Pitagowan to Glen Garry, sifting of potential grade separated junction layouts was undertaken.
- 3.4.2 A Junction and Access Strategy, developed during the DMRB Stage 1 by the A9 PES and SEA assessments identified the need for grade separated junctions at Aldclune (Killiecrankie to Pitagowan), and Bruar/Calvine (Pitagowan to Glen Garry). The junction sifting process is summarised below, with further information provided in Section 3.5 (DMRB Stage 2 Assessment of Route Options) of this chapter on the junction options taken forward.

### **Junction Sifting Outcomes**

#### Killiecrankie to Pitagowan

- 3.4.3 Further consideration and development of the Junction and Access Strategy proposed that a grade separated junction should replace the existing at-grade junction at Aldclune.
- 3.4.4 A review of the A9 PES and SEA assessment findings and the proposed mainline options proposed by the Mainline Route Options Sifting Workshop permitted the development of seven indicative junction options (Option A, B, C, D, E, F & G) at Aldclune.
- 3.4.5 A junction sifting workshop for Killiecrankie to Pitagowan was held in April 2015 to identify options and remove options from further consideration. The junction sifting workshop concluded that five of the options were considerably less advantageous in comparison with Junction Option A and B, and were consequently sifted out of the assessment.
- 3.4.6 The remaining two options were further developed and presented at a technical meeting with Transport Scotland in May 2015 to agree their inclusion in the DMRB Stage 2 assessments and were presented at public exhibitions held on 27-28 May 2015.

#### Pitagowan to Glen Garry

- 3.4.7 Further consideration and development of the Junction and Access Strategy identified a need for a grade separated junction to be provided in the vicinity of the existing at-grade junction at Bruar/Calvine. This location was deemed to be favourable to a junction closer to Calvine in relation to traffic volume increases on the local road network and potential environmental impacts including demolition and landscape and visual impacts on Calvine residents.
- 3.4.8 A review of the A9 PES and SEA assessment findings and the proposed mainline options proposed by the Mainline Route Options Sifting Workshop permitted the development of five indicative junction options at Bruar comprising two online options (Online A & B) and three localised offline options (Offline A, B & C).
- 3.4.9 A junction sifting workshop for Pitagowan to Glen Garry was held in April 2015 to identify options and remove options from further consideration. The junction sifting workshop developed one additional junction option (a loop and overbridge arrangement associated with the online mainline route options) but at a subsequent Technical Meeting with Transport Scotland it was concluded that this arrangement was significantly less advantageous in comparison to the other options and it was subsequently sifted out from further assessment.
- 3.4.10 The five options were further developed and presented at a technical meeting with Transport Scotland in April 2015, and it was agreed that all five should be taken forward to DMRB Stage 2 assessment and were also presented at public exhibitions held on 2-3 June 2015.

### 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 the Killiecrankie to Pitagowan and for Pitagowan to Glen Garry projects.
- 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 public exhibitions was taken into consideration during the development of the DMRB Stage 2 options and, ultimately, formed part of the criteria 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 option to be taken forward to DMRB Stage 3.

#### **Killiecrankie to Pitagowan**

- 3.5.4 The DMRB Stage 2 assessment for Killiecrankie to Pitagowan considered the feasibility of four different mainline route options over this 10.3km section of the A9, as shown on Figure 3.1. Each of the four options was considered with two alternative grade separated junction variants at Aldclune as shown on Figure 3.2.

#### 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. In terms of alignment, the routes can be considered in three sections, as set out in Table 3.2.

**Table 3.2: Proposed mainline route option alignments – Killiecrankie to Pitagowan**

Chainage (ch)	Alignment of Route Option Widening			
	Option 1	Option 2	Option 3	Option 4
ch700-3890	southbound	southbound	northbound	northbound
ch3890-5760	southbound	northbound	southbound	northbound
ch5760-11000	northbound (common to all)			

- 3.5.6 All proposed mainline route options transitioned into the same 'best-fit' alignment past Shierglas Quarry (ch4800). This alignment was developed to reduce potential impacts on Shierglas Quarry, Shierglas Farmhouse (Category B Listed) and associated buildings, and the River Tay SAC.
- 3.5.7 The final section (from ch5760-11000) was the same for all proposed route options, which minimised impact on the River Tay SAC and adjacent properties.

#### Grade Separated Junction Variants A and B

- 3.5.8 The mainline alignments included two variants (options) of the grade separated junction at Aldclune (Variants A and B), as shown on Figure 3.2.
- 3.5.9 Junction Variant A comprised a grade separated junction at Aldclune with a southbound merge slip road to enable traffic to join the southbound carriageway, and a northbound diverge slip road to enable traffic to leave the northbound carriageway. Both slip roads would connect to the B8079 at either side respectively of the existing A9, via at-grade junctions.
- 3.5.10 This arrangement did not provide for traffic to leave the southbound carriageway or to join the northbound carriageway. Traffic wishing to travel north on the A9 from this location would instead

travel north along the B8079 through Blair Atholl and utilise the grade separated junction proposed at Bruar/Calvine. Traffic wishing to exit the A9 travelling south would instead either have to exit the A9 by utilising the grade separated junction proposed at Bruar/Calvine, or utilise the proposed grade separated junction at Pitlochry (North) within the Pitlochry to Killiecrankie A9 dualling project.

- 3.5.11 Junction Variant B is a grade separated junction with a larger footprint (land requirement) than Variant A. However, it provides for all northbound and southbound traffic movements. All slip roads for this junction variant connect to the B8079 via at-grade junctions.

#### Killiecrankie to Pitagowan DMRB Stage 2 Findings

- 3.5.12 Option 4B (i.e. mainline route Option 4 and Grade Separated Junction Variant B) was selected as the preferred route option to be taken forward to DMRB Stage 3. A brief summary of the engineering, environmental and traffic and economic consideration is provided below.

#### *Engineering Assessment*

- 3.5.13 The DMRB Stage 2 assessment concluded that from an engineering perspective, Option 4 was most favourable due to relative ease of constructability. Option 4 requires the least volume of material excavation from site, a better balance of earthworks and the retention of the Allt Girnaig and Allt Chluain underbridges, avoiding demolition of existing bridges and construction of new replacement bridges. The Grade Separated Junction Variant B also provides for all northbound and southbound traffic movements at Aldclune Junction with slip roads connecting to the B8079 via at-grade junctions.

#### *Environmental Assessment*

- 3.5.14 The DMRB Stage 2 assessment concluded that from an environmental perspective, Option 4 was considered to have comparatively lower environmental impacts such as avoiding sensitive habitats associated with the River Tay SAC, including an active salmon pool on the southbound site of the River Garry Essangal structure. The engineering benefits mentioned above, i.e. retaining Allt Chluain and Allt Girnaig underbridges, would also reduce the associated resource acquisition and waste disposal impact on the environment.

#### *Traffic and Economic Assessment*

- 3.5.15 The DMRB Stage 2 assessment concluded that from a traffic and economic perspective, Junction Variant B had the most beneficial impacts, as follows:
- allows full movements which facilitates operation, maintenance and reduces costs;
  - avoids an increase in traffic volumes on the B8079 through Blair Atholl (particularly HGVs), improving journey time and safety;
  - retains access to Blair Atholl, protecting economic growth; and
  - retains all access for existing movements.

- 3.5.16 These economic and traffic benefits contribute towards the A9 Dualling Programme Objectives outlined in Section 2.4: A9 Dualling Programme Review (Chapter 2: Need for the Scheme).

#### **Pitagowan to Glen Garry**

- 3.5.17 The DMRB Stage 2 assessment for Pitagowan to Glen Garry considered the feasibility of four different mainline route options over this 11.4km section of the A9, as shown on Figure 3.3 One grade separated junction arrangement was considered for Options 1 and 2 at Bruar/Calvine, and three grade separated junction variants were considered for Options 3 and 4 as shown in Figure 3.4.

#### Mainline Route Options 1-4

- 3.5.18 In terms of alignment, Mainline Route Options 1-4 can be considered in three sections, as set out in Table 3.3.

**Table 3.3: Mainline route option alignments – Pitagowan to Glen Garry**

*Chainage (ch)	Alignment of Route Option Widening			
	Option 1	Option 2	Option 3	Option 4
ch0 (start of project) to ch1600	northbound	northbound	localised offline	localised offline
ch1600 to ch8000	northbound transitioning to southbound (common to all options)			
ch8000 to ch11400 (end of project)	northbound	southbound	northbound	southbound

\*Chainages are from Stage 2 Route Options, Project 06: Pitagowan to Glen Garry

3.5.19 For all options the majority of the route consisted of online widening to either the northbound or southbound carriageway of the existing A9. The only exception to this was the localised offline alignment for Options 3 and 4 between ch0 at the River Garry Crossing and ch1600 at Calvine. The central section (from ch1600 to ch8000) was the same for all proposed mainline route options.

Grade Separated Junction for Mainline Route Options 1 and 2

3.5.20 The Bruar/Calvine Junction for these mainline route options was a grade separated junction, with provision for northbound and southbound traffic as follows:

- Northbound: the northbound slip roads (for exiting the A9 or for joining the A9 heading northwards towards Inverness) would connect to the existing B847 via a new connector road and an at-grade junction formed with the B847. Vehicles would then pass under the A9 mainline via an existing underbridge to reach Bruar and Pitagowan.
- Southbound: the southbound slip roads (for exiting the A9 or for joining the A9 heading southwards towards Perth) would connect to a new roundabout connecting to the B8079 and the B847 local roads.

3.5.21 Figure 3.3 shows the proposed junction for Options 1 and 2. The existing A9 bridge over the River Garry at Pitaldonich would be demolished and replaced with a new wider bridge, as part of the alignment and junction locations for Options 1 and 2.

Grade Separated Junction Variants for Mainline Route Options 3 and 4

3.5.22 The existing A9 bridge at the River Garry would be retained and used for the southbound merge slip road for mainline route options 3A and 4A. Three grade separated junction variants (Junction Variants A-C) were considered, as described below and shown in Figure 3.4.

*Grade Separated Junction Variant A*

3.5.23 Grade Separated Junction Variant A was a grade separated junction which has a similar form to the junction proposed for Option 1 and 2. The main difference is that the northbound junction and southbound roundabout components of the junction are in a different position (further from Bruar/Pitagowan and closer to the River Garry) because of the re-aligned mainline carriageway.

*Grade Separated Junction Variant B*

3.5.24 Grade Separated Junction Variant B differed from Variant A primarily in terms of having a new overbridge to cross the localised offline section of the mainline of the proposed scheme (instead of using the existing B847 Pitagowan underbridge which is an integral part of Junction Variant A), and a loop arrangement for northbound traffic instead of a connector road and junction.

3.5.25 To achieve clearance requirements under the new junction overbridge, a reduction in level of the mainline was necessary, creating a vertical alignment that is locally lower than for Option 3A.

*Grade Separated Junction Variant C*

3.5.26 Grade Separated Junction Variant C proposed a new underbridge to cross the localised offline section of the mainline of the proposed scheme which was a key difference in design to Variants A and B but, in similarity to Variant B, contained a loop arrangement for northbound traffic. Southbound provision

was also similar to Variant B. The Variant C loop for northbound traffic was necessarily larger than is required for Variant B, due to the existing road alignments and land topography.

- 3.5.27 To achieve clearance requirements over the new junction underbridge, an increase in level of the mainline was also necessary for Variant C, creating a vertical alignment that is locally higher than the other junction variants.

#### Pitagowan to Glen Garry DMRB Stage 2 Findings

- 3.5.28 Option 3C (i.e. mainline route option 3 and grade separated Junction Variant C) was selected as the preferred route option to be taken forward to DMRB Stage 3. A brief summary of the engineering, environmental and traffic and economic consideration is provided below.

#### *Engineering Assessment*

- 3.5.29 The DMRB Stage 2 assessment concluded that from an engineering perspective, Option 3 with Junction Variant C (Option 3C) was considered most favourable. Option 3C comprised northbound widening in the northern part of this project, preventing the need for cross-overs during construction, meaning an easier construction method. The localised offline alignment developed at Bruar also provided more scope to accommodate a grade separated junction and associated slip roads.
- 3.5.30 Other route options involved demolition of the Pitaldonich Underbridge and the likely demolition of the Pitagowan Road Underbridge, with the construction of new wider structures at each location. However, Option 3C re-uses the Pitaldonich Underbridge as a new slip road with a new structure constructed for the mainline only. The Pitagowan Road Underbridge would be widened only under Option 3C.

#### *Environmental Assessment*

- 3.5.31 The DMRB Stage 2 assessment concluded that route option 3C (alongside 3A) had the least impact on the view from the road. Between Tomban, east of Bruar and Calvine, views south across the relatively flat farmland of the valley floor would remain open. Views to the north would generally remain partly restricted due to the existing vegetation and adjacent topography, however, the realignment of the A9 on embankment to the south would open up views of the wooded valley slopes to the north.

#### *Traffic and Economic Assessment*

- 3.5.32 The DMRB Stage 2 assessment concluded that from a traffic and economic perspective, Option 3C was favoured. Option 3C avoided cross-overs in the northern section alignment, which reduced the need for traffic management and improves journey times and safety for all road users during construction.
- 3.5.33 Option 3C mainline alignment provided a new offline dual carriageway section past Bruar, resolving constructability, reducing traffic and improving safety during the construction phase. Traffic travelling on the northbound carriageway of the A9 towards the B8079 would be required to travel for a longer distance, via the B847 under Junction Option 3A in comparison to Junction Options 3C (and 3B).
- 3.5.34 Grade Separated Junction Variant C had various economic and traffic benefits, as follows:
- improved connectivity through construction as construction would be separate to existing A9; and
  - improved connectivity compared to Junction A as this design required northbound traffic to travel a longer distance along the B847 to Bruar, and created traffic volume increases at Pitagowan.
- 3.5.35 These economic and traffic benefits contribute towards the A9 Dualling Programme Objectives outlined in Section 2.4: A9 Dualling Programme Review (Chapter 2: Need for the Scheme).



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

- 3.6.1 As explained in Section 3.5 (DMRB Stage 2 Assessment of Route Options), on the basis of the DMRB Stage 2 assessment and the outcome of the recommendations agreed at the preferred route workshops it was recommended that Route Option 4B was taken forward for Killiecrankie to Pitagowan, and Route Option 3C for Pitagowan to Glen Garry. It was also decided that it would be beneficial to combine these adjoining sections for the DMRB Stage 3 assessment. The amalgamation of these projects provides several benefits including:
- a better earthworks balance where the surplus from Killiecrankie to Pitagowan balances the deficit identified from Pitagowan to Glen Garry, minimising the impact of material disposal/import and associated costs;
  - the development of more effective environmental mitigation strategies in relation to potential environmental impacts on the floodplain and designated sites with the River Garry (part of the River Tay SAC) flowing through both projects;
  - a more effective strategy to be developed for assessing existing local access arrangements and access requirements to properties and land adjacent to the A9, particularly at the interface between the two individual projects;
  - a more effective strategy to be developed for considering traffic movements between the A9 and Blair Atholl and the surrounding area as the combined project will include grade separated junctions both to the south and north of the town; and
  - a greater understanding of the potential cumulative construction impacts resulting from the individual projects and allows the potential opportunities for reducing certain construction impacts to be assessed, such as minimising the distance travelled by HGVs transporting earthworks material.
- 3.6.2 During the DMRB Stage 3 assessment, the preferred option for Killiecrankie to Glen Garry has been subject to further refinement. The development and design of the proposed scheme through DMRB Stage 3 is described in Chapter 4 (Iterative Design Development) and Chapter 5 (The Proposed Scheme).

## **3.7 References**

- Jacobs (2016a) (*on behalf of Transport Scotland*). A9 Dualling Programme: Killiecrankie to Pitagowan – DMRB Stage 2 Scheme Assessment Report
- Jacobs (2016b) (*on behalf of Transport Scotland*). A9 Dualling Programme: Pitagowan to Glen Garry – DMRB Stage 2 Scheme Assessment Report
- Transport Scotland (2013) A9 Dualling: Strategic Environmental Assessment (SEA)
- Transport Scotland (2014). DMRB Stage 1 Assessment. A9 Dualling: Preliminary Engineering Support Services (PES)