A9 DUALLING
PERTH TO INVERNESS

SIFTING OF INDICATIVE CORRIDOR OPTIONS

Assessment Report

A9 Dualling: Preliminary Engineering Support Services

May 2013

JACOBS

TRANSPORT SCOTLAND
The Scottish Government

Document control sheet

BPP 04 F8
version 15; Jan 2013

Project: A9 Dualling: Preliminary Engineering Services
Client: Transport Scotland Project No: B1557620
Document title: Sifting of Indicative Corridor Options Report
Ref. No:

	Originated by	Checked by	Reviewed by
ORIGINAL	NAME **A Iversen**	NAME **N Perrin**	NAME **S Burns**
Approved by	NAME **R Cairnduff**	As Project Manager I confirm that the above document(s) have been subjected to Jacobs' Check and Review procedure and that I **approve them for issue**	INITIALS
DATE **29/02/13**	**Document status**	Draft Issue	

REVISION	NAME **A Iversen**	NAME **N Perrin**	NAME **S Burns**
Approved by	NAME **R Cairnduff**	As Project Manager I confirm that the above document(s) have been subjected to Jacobs' Check and Review procedure and that I **approve them for issue**	INITIALS
DATE **08/05/13**	**Document status**	Final Issue	

REVISION 1	NAME **A Iverson**	NAME **N Perrin**	NAME **S Burns**
Approved by	NAME **R Cairnduff**	As Project Manager I confirm that the above document(s) have been subjected to Jacobs' Check and Review procedure and that I **approve them for issue**	INITIALS
DATE **24/05/13**	**Document status Client Issue**		

CONTENTS

Appendices

1. INTRODUCTION

1.1 Overview

The Cabinet Secretary for Infrastructure and Capital Investment launched the Infrastructure Investment Plan (IIP) on 6th December 2011 which provided an overview of the Scottish Government's plans for infrastructure investment over the coming decades. Contained within the plan is a commitment to complete the dualling of the A9 between Perth and Inverness by 2025.

This commitment builds on work undertaken in the Strategic Transport Projects Review (STPR) in 2008, which identified dualling of the A9 as a priority trunk road intervention.

Jacobs was commissioned by Transport Scotland in September 2012 to undertake a Preliminary Engineering Assessment, which in conjunction with a parallel Strategic Environmental Assessment (SEA) for the route, is considered to be the equivalent of a Design Manual for Roads and Bridges (DMRB) Stage 1 assessment for dualling the A9 between Perth and Inverness.

Figure 1.1: Location Plan

As an initial step in this assessment process, multiple indicative corridor options were identified and investigated to determine which potential corridors would be included in a DMRB Stage 1 assessment. This report summarises this sifting exercise and the results of this preliminary indicative corridor assessment.

The sifting exercise involved a desk-based constraints study of all potential indicative corridor options, some of which were developed following comments received at the Public Exhibitions held in December 2012. Summary tables and drawings for each option were developed to document the anticipated constraints to route provision.

The results of the sifting exercise were discussed at a workshop held on 28th January 2013. At the workshop, final decisions were made regarding the feasible indicative corridor options that will be progressed for further assessment as part of a DMRB Stage 1 assessment.

2. BACKGROUND

2.1 Previous Studies

The dualling of the A9 is based on findings from the Strategic Transport Projects Review (STPR). The 2008 STPR identified the dualling of the A9 between Perth and Inverness as a priority trunk road intervention.

2.2 Objectives

The following scheme objectives were developed from the A9 STPR node and corridor objectives to provide a more targeted and measurable context for the A9 Dualling: Preliminary Engineering Support Services commission:

1) To improve the operational performance of the A9 by:
   - Reducing journey times
   - Improving journey time reliability

2) To improve safety for motorised and non-motorised users by:
   - Reducing accident severity
   - Reducing driver stress

3) To facilitate active travel in the corridor

4) To improve integration with Public Transport Facilities

These four objectives are discussed in further detail in Section 5 of this report, as they relate to the Sifting Part 1 review of A9 corridor options.

3. METHODOLOGY

3.1 Introduction

The indicative corridor sifting methodology involves a two-stage preliminary assessment of numerous indicative corridor options which warrant a high-level study, prior to initiating the DMRB Stage 1 Assessment. Jacobs first identified these indicative corridor options, further described in Section 4, through a desk-based study of alternatives with varied advantages and disadvantages. During the corridor sifting process, Jacobs analysed each indicative corridor option based on established objectives (Sifting Part 1) and relevant DMRB type criteria (Sifting Part 2).

The sifting assessment also included a workshop to present the findings to the wider project team and seek agreement on which options would merit further assessment.

Figure 3.1 below illustrates the sequence of events for the overall sifting of indicative options assessment process,

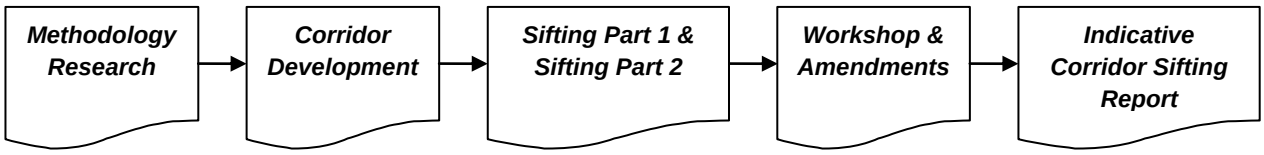

Figure 3.1: Methodology Outline

3.2 Sifting Part 1

In Sifting Part 1, all indicative corridor options were assessed against the four key scheme objectives. These objectives involve improvements to operational performance (journey time and reliability), road user safety, consideration of active travel, and integration of public transport facilities. The assessment was based on whether or not each respective indicative corridor option met each scheme objective. Results were recorded in the form of a Yes or No answer with some additional comment to record the justification for each decision.

Those indicative corridor options which satisfied the four scheme objectives in Sifting Part 1 would continue through the process to Sifting Part 2. In some cases, an option which clearly met some scheme objectives, yet failed to satisfy all four of them, would also continue to Sifting Part 2 upon documentation of the decision.

3.3 Sifting Part 2

Those indicative corridor options which successfully passed Sifting Part 1 were subject to a more detailed assessment in Sifting Part 2. The corridor options were assessed at a high level against both DMRB Stage 1 type criteria (engineering, environmental, and economics) and a general assessment of deliverability.

Baseline engineering, built environment, topographical and geotechnical constraints information was gathered. Environmental constraints collated as part of the Strategic Environmental Assessment (SEA) were received from CH2M. Economic data was compiled based on route option lengths and locations. The reader should refer to the example sifting option table in Appendix B which provides details of the sifting categories and descriptions of the assessment criteria used.

Sifting Part 2 comprised a negative assessment of the indicative corridor options to identify which were significantly less advantageous than others and therefore were sifted out and removed from further consideration.

3.4 Sifting Workshop

The results of the Sifting Part 1 and Sifting Part 2 were discussed at a workshop held on 28th January, 2013. Further details of the workshop review and amendments to options are provided in Section 7 of this Report.

3.5 Terminology and Assumptions

During the sifting process, various terms and assumptions were developed to provide a consistent approach to the negative assessment of indicative corridor options, as listed in Table 3.1. Additional terminology relating to the specific criteria in the Sifting Part 2 is included in Appendix B.

Corridor Sifting Terminology and Assumptions
Scheme Extents The A9 extends from Inveralmond Roundabout in Perth to Inshes Junction in Inverness. Inveralmond Roundabout marks the southern extent of the scheme however the proposals for grade separation of the junction and any other improvements to the south of the roundabout are being considered as part of the A9 Kier to Luncarty Corridor Study.
Geographical Sections This section of the A9 has been split into six geographical sections for the sifting assessment. The six sections are; Section A: Inveralmond to Tay Crossing Section B: Tay Crossing to Bruar Section C: Bruar to Dalwhinnie Section D: Dalwhinnie to Newtonmore Section E: Newtonmore to Kinveachy Section F: Kinveachy to Inverness
Option Extents (General) Offline options (and the features assessed such as lengths, impacts etc.) include both the offline segment and the online segment(s) which ties into the offline portion.
Route Corridor Options Segments of online and offline options along the existing A9 corridor, divided into manageable study areas Separated based on geographic and demographic characteristics.
Grade Separated Junctions (Sifting Part 2) Where proposed options ventured offline, it was assumed that a grade separated junction would be provided at the beginning and end of the existing A9 tie-in point locations. Furthermore grade separated junctions were proposed at all crossings of Class A and B side roads.
Environmental Impacts (Sifting Part 2) Jacobs initially considered environmental impacts based on actual intersection between an indicative corridor option and impacted sites. Environmental impacts reported by CH2M included impacts on sites within 100m outside of an indicative corridor.
Sustainability For the purposes of the sifting assessment, sustainability benefits relate to reuse of the existing A9 corridor with an assumed reduction in environmental impacts and construction costs.

Table 3.1: Terminology and Assumptions

4. INDICATIVE CORRIDOR OPTIONS

4.1 Introduction

The process of generating indicative corridor options for this sifting assessment primarily focused on identifying broadly different corridors which met the scheme objectives, rather than focusing on subtly different variants within each concept. In comparison to each other, the indicative corridor options entail significant differences rather than minor differences at this stage.

It is important to note that each option should be considered as a high level conceptual proposal, based on a general corridor model and not a specific route alignment. The indicative nature of the high level corridor options allows for flexibility, with a potential for flexibility during future alignment development. The indicative corridor options assessed in Sifting Parts 1 and 2 are summarised below.

4.2 Indicative Broad Corridor Options (refer to drawing B1557602/000/001 in Appendix E)

Indicative Broad Corridor Options A to G were developed as high level strategic options which are remote from the existing A9 corridor. These corridors between Perth and Inverness are large-scale general concepts which vary significantly from the existing route of the existing A9 trunk road. Some of these options were developed following comments received at the A9 Public Exhibitions held in December 2012.

Option A Perth to Inverness: The concept of this option is to provide the most direct route between the two cities irrespective of any constraints.

Option B Ballinluig to Carrbridge: This option was developed to provide a more direct line between Ballinluig and Carrbridge irrespective of any topographical or physical constraints and removing the need to travel the longer length of existing A9 via Drumochter Pass and Newtonmore etc.

Option C Tunnel at Drumochter Pass: The principle behind this option is to provide an offline tunnel to avoid one of the highest points along the existing A9 most affected by adverse weather.

Option D Offline from Newtonmore to Inverness: Similar to Option B, this option was developed to provide a more direct line between Newtonmore and Inverness irrespective of any constraints and removing the need to travel the longer length of existing A9 via Kingussie, Aviemore and the Slochd etc.

Option E Offline Tunnel from Kincraig to Tomatin: An offline tunnel option to avoid a high point along the existing A9 often affected by adverse weather and also constrained topographically in the Slochd area.

Option F Inveralmond to Pitlochry: This option is generally aligned to utilise existing road infrastructure corridors including the A93 and the A924 via Blairgowrie.

Option G Dalwhinnie to Inverness: This option is generally aligned to utilise existing road infrastructure corridors including the A889, A86 and the A82 via Fort Augustus. From Fort Augustus the A9 and A82 would share a new route running along the south of Loch Ness.

4.3 Sectioned Indicative Corridor Options (refer to drawings B1557602/000/002 to B1557602/000/007 in Appendix E)

The A9 between Perth and Inverness has been sub-divided into six sections. The extent of these sections was determined by the length of the indicative route corridors which generally have a common start and end point to ensure comparative assessment of all options.

In all sections, the first corridor is the red corridor which comprises online widening of the existing A9. Thereafter, the other corridors in each section comprise part of the red corridors in combination with an offline alternative. A brief description of the options within each section is provided below.

4.3.1 Section A: Inveralmond to Tay Crossing

- Option A1 (Red): Online Inveralmond to Tay Crossing
- Option A2 (Black): Online to Luncarty, offline to the west and then to the east to Bankfoot, online thereafter
- Option A3 (Orange): Online to Bankfoot and thereafter offline to the south of Birnam Hill
- Option A4 (Pink): Online to Bankfoot and thereafter offline to south of railway line and existing trunk road
- Option A5 (Green): Online to Pass of Birnam and thereafter offline to north of Dunkeld and Birnam
- Option A6 (Blue): Online to Pass of Birnam and thereafter offline to south of railway line and existing trunk road

4.3.2 Section B: Tay Crossing to Bruar

- Option B1 (Red): Online Tay Crossing to Bruar
- Option B2 (Black): Offline west of railway to tie in at Ballinluig, online thereafter
- Option B3 (Orange): Offline west of railway and River Tummel to tie in at Pitlochry, online thereafter
- Option B4 (Pink): Online to Pitlochry, offline west of River Tummel to tie in at Blair Atholl
- Option B5 (Green): Online to south of Bruar, offline to the west at end of section

4.3.3 Section C: Bruar to Dalwhinnie

- Option C1 (Red) Online Bruar to Dalwhinnie

4.3.4 Section D: Dalwhinnie to Newtonmore

- Option D1 (Red): Online Dalwhinnie to Newtonmore
- Option D2 (Black) Offline east to south of Crubenmore, online thereafter
- Option D3 (Orange): Offline west of Dalwhinnie to Crubenmore, online thereafter

4.3.5 Section E: Newtonmore to Kinveachy

- Option E1 (Red): Online Newtonmore to Kinveachy
- Option E2 (Black): Offline north to Kingussie, online thereafter
- Option E3 (Orange): Online to Kingussie, offline south to Kinveachy
- Option E4 (Pink): Online to Kingussie, offline to Aviemore, online thereafter
- Option E5 (Green): Offline south at start of section, online thereafter

4.3.6 Section F: Kinveachy to Inverness

- Option F1 (Red): Online Kinveachy to Inverness
- Option F2 (Black): Offline west of Carrbridge, online thereafter
- Option F3 (Orange): Online apart from offline section to the east of Slochd
- Option F4 (Pink): Online apart from offline section between Slochd and Tomatin
- Option F5 (Green) Online apart from offline section west of A9 at Moy
- Option F6 (Blue) Online to Moy, offline to east to Craggiemore, online thereafter

5. SIFTING PART 1: SCHEME OBJECTIVES

5.1 Introduction

All of the indicative broad corridor and sectioned indicative corridor options were assessed according to the four key scheme objectives previously outlined in Section 2. Refer to the tables in Appendix A which were developed for all corridor options at Sifting Part 1. These tables illustrate a positive or negative response to each scheme objective, along with a brief justification. The results of Sifting Part 1 are discussed below.

5.2 Broad Route Corridor Options

Options A, B, D, F, and G did not pass Sifting Part 1 and will be discarded. These options were not considered to address the scheme objectives. Options C and E passed Sifting Part 1 and continued to Sifting Part 2. Option C satisfied all four of the scheme objectives. Option E satisfied three of the scheme objectives. Option E did not meet the public transport objective as the facilities between Kincraig and Tomatin would be bypassed by the tunnel section. However, given the performance against the other three objectives, it was considered acceptable to progress Option C to Sifting Part 2. The table below presents a summary of the Sifting Part 1 results.

Option	Objectives			
	Improve Operational Performance – Reduce Journey Times and Improve Journey Reliability	**Improve Safety – Reduce Accident Severity and Driver Stress**	**Facilitate Active Travel in the Corridor**	**Improve Integration with Public Transport Facilities**
A	YES	YES	NO	NO
B	YES	YES	NO	NO
C	YES	YES	YES	YES
D	YES	YES	NO	NO
E	YES	YES	YES	NO
F	NO	YES	NO	NO
G	NO	YES	NO	NO

Table 5.1: Broad Route Corridor Sifting Part 1 Summary

5.3 Sectioned Indicative Corridor Options

All of the sectioned indicative corridor options within each of the geographical section (Sections A – F) met the scheme objectives and therefore passed Sifting Part 1 and continued to Sifting Part 2.

6. SIFTING PART 2: DMRB & DELIVERABILITY CRITERIA

Those options which successfully passed Sifting Part 1 were subject to a more detailed assessment in Sifting Part 2. In Sifting Part 2, the corridor options were assessed at a high level against both DMRB Stage 1 type criteria and general deliverability criteria. Refer to the example sifting option table in Appendix B which provides an explanation of the sifting assessment criteria categories and descriptions.

The completed tables for each option assessed at Sifting Part 2 are included in Appendix C.

7. SIFTING WORKSHOP ADDITIONAL ROUTES, AMENDMENTS AND DECISIONS

7.1 Workshop

A sifting assessment workshop was conducted on 28th January 2013 to review the outcome of the Sifting Part 1 and Sifting Part 2 . The objective of the workshop was to review and challenge the negative sifting exercise and thereafter agree those options that are clearly not feasible and/or desirable to progress further.

The workshop was facilitated by Capital Value & Risk Limited. Participants included representatives from the commission client Transport Scotland, the A9 dualling preliminary engineering services consultant Jacobs, the A9 dualling strategic environmental assessment consultant CH2M, the Valuation Office Agency and other consultants currently progressing early implementation schemes Jacobs, Atkins and URS in order that the detailed knowledge they possess for particular short sections of the A9 could be considered. A copy of the workshop report is included as Appendix D.

7.2 Additional Corridor Options

The workshop participants agreed there to be merit in assessing a new option similar to the Option A4 (Pink) but retaining the use of the existing A9 dual carriageway at Pass of Birnam. As a result Option A6 (Blue) was to be developed. A6 would follow the existing A9 from Inveralmond to the end of the Pass of Birnam dual carriageway section. From this location, the route crosses the railway and continues offline following the line of Option A4 (Pink), south of the railway and the A9 towards a tie in at the Tay Crossing. It was agreed that Sifting Part 1 and Sifting Part 2 would be undertaken on this corridor and the results of this assessment are included in Appendix A and C respectively.

7.3 Amendments

A number of amendments were made to the Sifting Part 1 and Sifting Part 2 tables following discussions at the workshop. The key amendments are summarised in Table 7.1.

Issue	Action
Journey Times	Amend wording to ensure that the descriptions relate most specifically to strategic traffic/end to end journeys.
Traffic Restrictions in Tunnels	Reference was made to possible restrictions on the transportation of whisky and other flammable goods through road tunnels. This was included in the assessment of tunnels against the safety scheme objective in Sifting Part 1. Post Workshop Note: Road tunnels are categorised for the purposes of prohibiting or restricting certain dangerous goods. Tunnel provision would require a risk analysis to be carried out in accordance with EU Directive 2004-54-EC Minimum Safety Requirements for Tunnels in the Trans-European Road Network and would consider tunnel characteristics, alternative routes, traffic management measures etc.

Table 7.1: Sifting Part 1 Amendments

Issue	Action
Tunnel Management	The increased resources required for management and maintenance of tunnels was to be included in the assessment of the routes.
Assessment of Environmental Impact	The initial results were based on direct impacts on environmental sites whereas the amended version shown was based on the corridor being within 100 metres of the site to accord with the approach adopted in the Strategic Environmental Assessment.
Mixed SSSI	Mixed Sites of Special Scientific Interest (SSSI) status refers to sites designated for biodiversity and geological reasons. Any reference to an impact on a site designated as a Mixed SSSI was to be included under the Impact on Designated Geological Sites category in addition to the Impact on Designated Biodiversity Sites. These Mixed SSSI impacts would be referenced in the tables.
Maintenance on High Ground	Include reference to increased maintenance associated with sections of some routes located at higher altitudes
Increased Offline Impacts	Tables to include reference to additional impact associated with offline construction; eg land use, and landscape, visual and severance issues
Land Use Impacts	The workshop agreed that it would be beneficial to include an assessment of land use. The tables were amended to include assessment of 'Land Capability for Agriculture and Water Environment'.
Impact of Bypassing Communities	Participants noted that offline route options may result in objection from settlements and businesses that could be bypassed by certain routes Participants also noted potential difficulty associated with offline routes regarding access provision/connection to settlements
Statutory Body Comments	Notes to be added regarding potential objection from statutory bodies due to impact of certain routes on designated sites Some parties may have a preference for routes that avoid designated sites

Table 7.2: Sifting Part 2 Amendments

There were a number of other minor amendments made during the workshop. These are highlighted in the sifting workshop report in Appendix D.

7.4 Decisions

The Sifting Part 2 tables form the basis of the workshop decisions made regarding which options should be progressed and these are presented on the following pages.

7.4.1 Decision 1 – Broad Corridor Option C Drumochter Tunnel

The reasons why Route Corridor Option C is significantly less advantageous than the other options are as follows;

- It entails a significant length of twin bore tunnel to be constructed (approx 15km)
- Cost of tunnel is significantly greater than for an over ground option for this section of the route
- It requires significant works to be undertaken at the online tie ins with disruption to road users
- The northern tunnel entrance is located within the Drumochter Hills Special Area of Conservation (SAC) and Mixed SSSI
- Tunnel management, maintenance requirements and potential restrictions on usage for particular vehicles are likely to offset the benefits of improved winter resilience
- Significant length of existing A9 dualled section bypassed by tunnel becomes redundant

It is therefore recommended that Option C should not be taken forward for further consideration.

7.4.2 Decision 2 – Broad Corridor Option E Kincraig to Tomatin Tunnel

The reasons why Route Corridor Option E is significantly less advantageous than the other options are as follows;

- It entails a significant length of twin bore tunnel to be constructed (approx 17km)
- Cost of tunnel is significantly greater than for an over ground option for this section of the route
- It requires significant works to be undertaken at the online tie ins with disruption to road users
- The southern end of the tunnel is located close to a National Scenic Area
- Tunnel management, maintenance requirements and potential restrictions on usage for particular vehicles are likely to offset the benefits of improved winter resilience
- There is the possibility of two trunk roads in existence, both existing A9 to link with A95 and a new A9

It is therefore recommended that Option E should not be taken forward for further consideration.

7.4.3 Decision 3 – Section A: Inveralmond to Tay Crossing Option A2 (Black)

The reasons why Option A2 is significantly less advantageous than the other options are as follows;

- It comprises a significant length of offline works (8.6km) with resulting impacts e.g. land use, visual and severance issues
- The offline section will create a new road corridor in close proximity to the existing road
- The offline section entails additional construction costs
- The existing A9 will be retained for access purposes resulting in an additional 8.7km of de-trunking works

It is therefore recommended that Option A2 should not be taken forward for further consideration.

7.4.4 Decision 4 – Section A: Inveralmond to Tay Crossing Option A3 (Orange)

The reasons why Option A3 is significantly less advantageous than the other options are as follows;

- It comprises a significant length of offline works (10.2km) with resulting impacts e.g. land use, visual and severance issues
- The offline section passes through an area of difficult and hilly terrain south of Birnam Hill
- The offline section entails significant additional construction costs
- It creates a new corridor through Ancient Woodland and Semi-Natural Ancient Woodland
- It creates a new corridor through an Historic Garden and Designed Landscape and National Scenic Area
- The existing A9 will be retained for access resulting in an additional 11.1km of de-trunking works
- Existing dualled section south of Dunkeld bypassed.
- A section of the route at higher altitude would be affected by adverse weather

It is therefore recommended that Option A3 should not be taken forward for further consideration.

7.4.5 Decision 5 – Section A: Inveralmond to Tay Crossing Option A4 (Pink)

The reasons why Option A4 is significantly less advantageous than the other options are as follows;

- It comprises a significant length of offline works (10.5km) with resulting impacts e.g. land use, visual and severance issues
- The offline section passes through an area of difficult terrain through Birnam Wood and Birnam Hill
- It poses high design and constructability risk through a constrained wooded area adjacent to the railway and village of Dunkeld
- The offline section entails significant additional construction costs
- It creates a new corridor through Ancient Woodland and Semi-Natural Ancient Woodland
- It creates a new corridor through an Historic Garden and Designed Landscape and National Scenic Area
- The existing A9 will be retained for access resulting in an additional 11.0km of de-trunking works
- Existing dualled section south of Dunkeld bypassed
- The route is 0.5km longer than this section of the existing A9
- There are possible issues relating to connectivity with Dunkeld and Birnam on this route option.

It is therefore recommended that Option A4 should not be taken forward for further consideration.

7.4.6 Decision 6 – Section A: Inveralmond to Tay Crossing Option A5 (Green)

The reasons why Option A5 is significantly less advantageous than the other options are as follows;

- It comprises a significant length of offline works (8.7km) with resulting impacts e.g. land use, visual and severance issues
- The offline section passes through an area of difficult terrain on the north side of the River Tay
- The offline section entails significant additional construction costs
- It requires a new dual carriageway crossing of the River Tay at a new location east of Dunkeld
- It creates a new corridor through Ancient Woodland and Semi-Natural Ancient Woodland
- It creates a new corridor through an Historic Garden and Designed Landscape and National Scenic Area and will be highly visible from the surrounding area
- The Dunkeld House Scheduled Monument is in close proximity to the route
- The route is 0.7km longer than this section of the existing A9
- The offline route will result in severance of businesses at Birnam and Dunkeld

It is therefore recommended that Option A5 should not be taken forward for further consideration.

7.4.7 Additional Corridor Option A6 (Blue)

The workshop identified that further work was required on Option A4 Pink Route north of Pass of Birnam to Jubilee Bridge by Preliminary Engineeering Services commission and then transfer information to URS for their scheme specific assessment work on the Birnam to Tay Crossing section. Hence Option A6 was developed post workshop and a review of Sifting Part 1 and 2 details undertaken.

Although Option A6 omits bypassing the existing dualled carriageway south of Dunkeld the reasons for discounting Option A4 are still relevant to Option A6. In addition, as Option A6 departs from the line of the existing A9 further design and constructability issues are introduced in relation to the crossing of the adjacent railway line which is likely to involve a significant skewed structure. Therefore, the reasons why Option A6 is significantly less advantageous than the other options are as follows;

- It comprises a significant length of offline works (6.5km) with resulting impacts e.g. land use, visual and severance issues
- The offline section passes through an area of difficult terrain through Birnam Wood and Birnam Hill
- It poses high design and constructability risk through a constrained wooded area adjacent to the railway and village of Dunkeld
- The offline section entails significant additional construction costs
- It creates a new corridor through Ancient Woodland and Semi-Natural Ancient Woodland
- It creates a new corridor through a Historic Garden, Designed Landscape and National Scenic Area
- The existing A9 will be retained for access resulting in an additional 6.4km of de-trunking works
- There are possible issues relating to connectivity with Dunkeld and Birnam on this route option
- Crossing of the railway line will entail a significant skewed structure.

As highlighted in the Workshop Report, Option A6 has also been further assessed by URS who have identified that potential benefits of Corridor Option A6 are outweighed by the significant environmental impacts, reduced connectivity to neighbouring communities, increased engineering complexities and risk, and significant additional construction costs.

It is therefore recommended that Option A6 should not be taken forward for further consideration.

Keep Options:

As a result of the above decisions, within Section A Inveralmond to Tay Crossing, Option A1 will be progressed for further assessment as part of a DMRB Stage 1 assessment.

7.4.8 Decision 7 – Section B Tay Crossing to Bruar Option B3 (Orange)

The reasons why Option B3 is significantly less advantageous than the other options are as follows;

- It comprises a significant length of offline works (15.1km) with resulting impacts e.g. land use, visual and severance issues
- The offline section bypasses 6km of existing A9 dual carriageway
- The offline section entails significant additional construction costs
- It creates a new corridor through approximately 3km of Ancient Woodland and Semi-Natural Ancient Woodland
- It creates a new corridor through approximately 3km of National Scenic Area
- The existing A9 will be retained for access resulting in an additional 15.8km of maintenance for the roads authority
- It requires a new dual carriageway crossing of the River Tay at a new location west of Ballinluig

It is therefore recommended that Option B3 should not be taken forward for further consideration.

Keep Options:

Workshop participants discussed the advantages and disadvantages of Option B4 (Pink). Disadvantages include the length of offline works required with associated visual impacts and increased costs and constructability issues. However, the advantages of keeping Option B4 include the avoidance of the Killiecrankie Battlefield site, the location of the River Tummel crossing and other environmental benefits for Pitlochry. For these reasons, it is recommended that Option B4 should be taken forward for further consideration.

As a result of the above decisions, within Section B Tay Crossing to Bruar, Options B1, B2, B4 and B5 will be progressed for further assessment as part of a DMRB Stage 1 assessment.

Keep Options:

The only indicative corridor option within Section C Bruar to Dalwhinnie is Option C1 which is an online corridor and progresses for further assessment as part of a DMRB Stage 1 assessment.

7.4.9 Decision 8 – Section D Dalwhinnie to Newtonmore Option D2 (Black)

The reasons why Option D2 is significantly less advantageous than the other options are as follows;

- It comprises a significant length of offline works (7.1km) through difficult terrain in the Cairngorms National Park with resulting impacts e.g. land use, visual and severance issues
- The offline section entails significant additional construction costs
- 3km of the offline section directly affects an SAC, Mixed SSSI, Ancient Woodland and Semi Natural Ancient Woodland
- The offline section would require diversion of the proposed SSE HV Line
- The existing A9 will be retained for access resulting in an additional 7.0km of de-trunking works

It is therefore recommended that Option D2 should not be taken forward for further consideration.

7.4.10 Decision 9 – Section D Dalwhinnie to Newtonmore Option D3 (Orange)

The reasons why Option D3 is significantly less advantageous than the other options are as follows;

- It comprises a significant length of offline works (10.7km) in the Cairngorms National Park and passing close to the village settlement of Dalwhinnie with resulting impacts e.g. land use, visual and severance issues
- The offline section entails significant additional construction costs
- It impacts a Scheduled Monument in the area
- The offline section would require 2 no. additional crossings of the railway line
- The existing A9 will be retained for access resulting in an additional 10.2km of de-trunking works
- The route is longer (0.4km) than this section of the existing A9
- The route requires a crossing of Spey SAC

It is therefore recommended that Option D3 should not be taken forward for further consideration.

A possible corridor option from Crubenmore junction to Kingussie, using the General Wade Road was also identified at the workshop. The disadvantages of this option were that it bypasses the majority of the existing Crubenmore dualled section and also existing businesses as well as impacting on the SSSI. There were no discernible advantages so the workshop concluded that this option should not be considered further.

Keep Options:

As a result of the above decisions, within Section D Dalwhinnie to Newtonmore, Option D1 will be progressed for further assessment as part of a DMRB Stage 1 assessment.

7.4.11 Decision 10 – Section E Newtonmore to Kinveachy Option E2 (Black)

The reasons why Option E2 is significantly less advantageous than the other options are as follows;

- It comprises a significant length of offline works (8.5km) in the Cairngorms National Park with resulting impacts e.g. land use, visual and severance issues
- The offline section passes close to settlements of Newtonmore and Kingussie with associated noise and air quality impacts
- The offline section creates a new road through a restricted corridor between the River Spey and the railway
- The offline section entails additional construction costs
- The existing A9 will be retained for access resulting in an additional 7.0km of de-trunking works
- Route goes through high-risk flooding zone

It is therefore recommended that Option E2 should not be taken forward for further consideration.

7.4.12 Decision 11 – Section E Newtonmore to Kinveachy Option E3 (Orange)

The reasons why Option E3 is significantly less advantageous than the other options are as follows;

- It comprises a significant length of offline works (27.2km) in the Cairngorms National Park with resulting impacts e.g. land use, visual and severance issues
- The offline section entails significant additional construction costs
- There is a direct impact on a RAMSAR designated wetland site
- The offline section creates a new corridor through Ancient Woodland, National Nature Reserve, National Scenic Area and an Historic Garden and Designed Landscape
- The route passes through an area of relatively poor ground with Alluvium and localised Peat
- The route directly impacts the existing SSE HV Line an additional 3 no. occasions compared with the existing A9
- The existing A9 will be retained for access resulting in an additional 27.0km of de-trunking works
- There are possible issues relating to connectivity with Aviemore on this route option.

It is therefore recommended that Option E3 should not be taken forward for further consideration.

7.4.13 Decision 12 – Section E Newtonmore to Kinveachy Option E4 (Pink)

The reasons why Option E4 is significantly less advantageous than the other options are as follows;

- It comprises a significant length of offline works (19.8km) in the Cairngorms National Park with resulting impacts e.g. land use, visual and severance issues
- The offline section entails significant additional construction costs
- There is a direct impact on a RAMSAR designated wetland site
- The offline section creates a new corridor through Ancient Woodland, National Nature Reserve, National Scenic Area and Historic Garden and Designed Landscape
- The route passes through an area of relatively poor ground with Alluvium and localised Peat
- The route directly impacts the existing SSE HV Line an additional 3 no. occasions compared with the existing A9
- The existing A9 will be retained for access resulting in an additional 20.0km of de-trunking works

It is therefore recommended that Option E4 should not be taken forward for further consideration.

7.4.14 Decision 13 – Section E Newtonmore to Kinveachy Option E5 (Green)

The reasons why Option E5 is significantly less advantageous than the other options are as follows;

- It comprises a section of offline works (3.5km) in the Cairngorms National Park with resulting impacts e.g. land use, visual and severance issues
- The offline section entails additional construction costs
- The route directly impacts the existing SSE HV Line on 2 no. occasions
- The existing A9 will be retained for access resulting in an additional 3.5km of de-trunking works

It is therefore recommended that Option E5 should not be taken forward for further consideration.

Keep Options:

Option E1 should be taken forward for further consideration but it is recommended that efforts to reduce the impact of this option on Insh Marshes SAC should be investigated**.**

In order to make provision for a possible grade separated junction in the vicinity of Newtonmore, it may be necessary to provide an alignment at the southern extent of the E1 corridor.

As a result of the above decisions, within Section E Newtonmore to Kinveachy, Option E1 will be progressed for further assessment as part of a DMRB Stage 1 assessment.

7.4.15 Decision 14 – Section F Kinveachy to Inverness Option F2 (Black)

The reasons why Option F2 is significantly less advantageous than the other options are as follows;

- It comprises a section of offline works (5.8km) in the Cairngorms National Park with resulting impacts e.g. land use, visual and severance issues
- The offline section creates a new 2.5km corridor through Ancient Woodland west of Carrbridge
- The existing A9 will be retained for access resulting in an additional 6.4km of de-trunking works

It is therefore recommended that Option F2 should not be taken forward for further consideration.

The workshop concluded that the focus should be on realigning Option F1 (Red) before moving to an F2 (Black) option.

7.4.16 Decision 15 – Section F Kinveachy to Inverness Option F3 (Orange)

The reasons why Option F3 is significantly less advantageous than the other options are as follows;

- It comprises a section of offline works (4.4km) in tunnel of which 3km is within the Cairngorms National Park
- Cost of tunnel is significantly greater than for over ground option for this section of the route
- Tunnel management, maintenance requirements and potential restrictions on usage for particular vehicles are likely to offset the benefits of improved winter resilience
- The existing A9 will be retained for access resulting in an additional 4.9km of de-trunking works

It is therefore recommended that Option F3 should not be taken forward for further consideration.

The workshop concluded that whilst F3 as a tunnel is not preferred, an investigation of the alignment to address the difficult Slochd summit terrain is required.

7.4.17 Decision 16 – Section F Kinveachy to Inverness Option F4 (Pink)

The reasons why Option F4 is significantly less advantageous than the other options are as follows;

- It comprises a section of offline works (4.7km) with resulting impacts e.g. land use, visual and severance issues
- The offline section entails additional construction costs

- It bypasses a 4km section of the existing A9 that is already dual carriageway cross section
- The existing A9 will be retained for access resulting in an additional 5.0km of de-trunking works

It is therefore recommended that Option F4 should not be taken forward for further consideration.

7.4.18 Decision 17 – Section F Kinveachy to Inverness Option F5 (Green)

The reasons why Option F5 is significantly less advantageous than the other options are as follows;

- It comprises a significant section of offline works (7.4km) with resulting impacts e.g. land use, visual and severance issues
- The offline section entails additional construction costs
- The offline section passes through an area of difficult terrain west of the existing A9
- It creates a new corridor through a small area of Ancient Woodland and Semi Natural Ancient Woodland and other undesignated woodland
- The existing A9 will be retained for access resulting in an additional 8.1km of de-trunking works

It is therefore recommended that Option F5 should not be taken forward for further consideration.

The workshop concluded that the focus should be on realigning the existing route corridor.

7.4.19 Decision 18 – Section F Kinveachy to Inverness Option F6 (Blue)

The reasons why Option F6 is significantly less advantageous than the other options are as follows;

- It comprises a section of offline works (7.6km) with resulting impacts e.g. land use, visual and severance issues
- The offline section entails additional construction costs
- The offline section impacts on linear development along the local road network and the settlement of Craggiemore built environment constraints including linear development and the settlement
- The offline section passes through small areas of Ancient Woodland and other areas of undesignated woodland
- It bypasses a 7km section of the existing A9 that is already dual carriageway cross section
- The existing A9 will be retained for access resulting in an additional 9.3km of de-trunking works

It is therefore recommended that Option F6 should not be taken forward for further consideration.

Keep Options:

As a result of the above decisions, within Section F Kinveachy to Inverness, Option F1 will be progressed for further assessment as part of a DMRB Stage 1 assessment.

Keep and develop Option F1- Existing A9 Alignment, to include an investigation to address the difficult Slochd summit terrain.

8. RESULTS

Following the sifting assessment and the decisions agreed at the workshop, the following route options remain available for further consideration as part of the DMRB Stage 1 Assessment.

- The red online corridor options within each geographical section (A1, B1, C1, D1, E1 and F1)
- The black offline corridor option B2 west of the railway line between Birnam and Ballinluig
- The pink offline corridor option B4 west of the River Tummel to Blair Atholl
- The green offline corridor option B5 south of Bruar

In addition, a number of variations within the corridor options arising from the workshop are to be investigated further. These include;

- A variation of the red corridor option E1 west of the existing trunk road between Newtonmore and Kinveachy to reduce the impact of Option E1 on the Insh Marches SAC
- A variation of the red corridor option E1 to make provision for a possible grade separated junction in the vicinity of Newtonmore

APPENDIX A – Sifting Part 1 Option Tables

APPENDIX B – Sifting Part 2 Criteria Descriptions

APPENDIX C – Sifting Part 2 Option Tables

APPENDIX D – Workshop Report

APPENDIX E – Drawings

A9 DUALLING
PERTH TO INVERNESS

TRANSPORT SCOTLAND
The Scottish Government