A82 Tarbet to Inverarnan Upgrade

Value for Money Workshop

Transport Scotland

January 2014

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Value for Money Workshop

Transport Scotland

January 2014

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Document history

A82 Tarbet to Inverarnan

Value for Money Workshop

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Appendices

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1 Introduction

1.1 Overview

A one day Value for Money Review workshop for the corridor options associated with the Tarbet to Inverarnan Upgrade project was held on 22 January 2014 with representatives of Transport Scotland and the CH2M HILL Fairhurst Joint Venture (CFJV).

Appendix A provides a copy of the information pack supplied to all participants. This provides details on the project and its considerations. It also provides information on the means for assessing and scoring risks discussed at the workshop. Appendix B provides a note of the session and reflects the discussions that took place. This appendix identifies workshop participants.

1.2 Report Structure

This report records the outcomes of the workshop. The structure reflects the session by reporting on:

- Value Engineering
- Risk Management

A82 Upgrade: VE WORKSHOP January 2014

		Options	Option 1		Option 2		Option 3		Comments
	OBJECTIVES	Weighting (%)	Existing A82 Corridor		Arrochar to Inveruglas to Inverarnan		High Road		
									Scoring: 3 is first and 1 is last
			Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	
4	TP03 - Stopping Opportunities	7.500	3	22.500	3	22.500	3	22.500	Option 1 - provides improvement opportunites along existing route, Option 2 provides partial improvement. Option 3 provides no improvement along existing route though opportunity to provide new ones on new road.
6	TP05 - Reduced Maintenance Disruption	7.500	1	7.500	2	15.000	3	22.500	Option 1 improves maintenance disruption on whole route but no close diversion route. Option 2 provides improved route and a partial diversion route. Option 3 provides new A82 route to standard with existing route as a close diversion alternative.
7	Environment	15.000	3	45.000	2	30.000	1	15.000	Option 1 - passes through existing corridor. Option 2 partially affects new route corridor, with significant environmental impact. Option 3 - significant environmental impact of new off-line corridor.
8	Safety inc TP02 - PIA Numbers (combine with 8)	15.000	2	30.000	2	30.000	2	30.000	Option 1 improves the existing corridor signficantly. Option 2 leaves part of existing corridor un-improved. Option 3 provides new road but existing corridor is left un-improved. Option 3 new road has steep gradients and high altitude will be prone to adverse weather.
9	Economy inc TP01 - Average Journey Times (combine with 9)	15.000	3	45.000	1	15.000	2	30.000	NESA and QUADRO. Option 1 - NPV of -£82.24m and a BCR of 0.22. Option 2 - NPV - -£113.64 and BCR of 0.07, Option 3 - NPV - -£171.77 and BCR of 0.19.
10	Integration inc TP04 - NMU Infrastructure (combined with 10,11)	5.000	3	15.000	2	10.000	1	5.000	Option 1 improves integration conditions for existing communities, Option 2 partially and Option 3 to little extent.
11	Accessibility and social inclusion inc TP04 - NMU Infrastructure (combined with 10,11)	5.000	3	15.000	2	10.000	1	5.000	Option 1 - Provides improvements to existing route, Option 2 provides improvements to part of route, Option 3 new route may not provide improvement along existing corridor
12	Engineering	12.500	1	12.500	1	12.500	1	12.500	Option 1 route through existing corridor, significant engineering challenges along shoreline, Option 2 - Engineering challenges as per option 1 though new off-line route south of Inveruglas and crossing of
13	Affordability	7.500	3	22.500	2	15.000	1	7.500	Option 1 - £204.75m, PVC 105.24, Option 2 - £234.00m, PVC 122.15, Option 3 - £397.80m, PVC 210.88
14	Public acceptability	10.000	3	30.000	2	20.000	1	10.000	Option 1 corridor already established and preferred at Stakeholder Workshop. Option 2, partial new off-line route, detours to Arrochar. Option 3, new route, environmental imapacts but was proposed by some attendees at Stakeholder Workshop.
	Total objectives weighting as %	100							
		Value Index		245.000		180.000		160.000	
		Ranking		1st		2nd		3rd	

2 Value Engineering

Session 1 of the workshop considered Value Engineering (VE) aspects. Discussion focused on the project objectives with the group agreeing to either merge similar objectives or accommodating overlap through appropriate weighting. The options were then scored against the agreed objectives. The outcomes of the VE workshop are shown below.

Three corridor options were examined:

- Option 1 – Existing A82 Road
- Option 2 – Arrochar to Inveruglas to Inverarnan
- Option 3 – High Road

Weighted scoring showed a clear preference for Option 1 followed by Option 2 and then Option 3.

The final VE matrix is shown on the following page.

A82 Upgrade: VE WORKSHOP January 2014									
	OBJECTIVES	Options	Option 1		Option 2		Option 3		Comments
		Weighting (%)	Existing A82 Corridor		Arrochar to Inveruglas to Inverarnan		High Road		
			Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	Scoring: 3 is first and 1 is last
4	TP03 - Stopping Opportunities	7.500	3	22.500	3	22.500	3	22.500	Option 1 - provides improvement opportunites along existing route, Option 2 provides partial improvement. Option 3 provides no improvement along existing route though opportunity to provide new ones on new road.
6	TP05 - Reduced Maintenance Disruption	7.500	1	7.500	2	15.000	3	22.500	Option 1 improves maintenance disruption on whole route but no close diversion route. Option 2 provides improved route and a partial diversion route. Option 3 provides new A82 route to standard with existing route as a close diversion alternative.
7	Environment	15.000	3	45.000	2	30.000	1	15.000	Option 1 - passes through existing corridor. Option 2 partially affects new route corridor, with significant environmental impact. Option 3 - significant environmental impact of new off-line corridor.
8	Safety inc TP02 - PIA Numbers (combine with 8)	15.000	2	30.000	2	30.000	2	30.000	Option 1 improves the existing corridor signficantly. Option 2 leaves part of existing corridor un-improved. Option 3 provides new road but existing corridor is left un-improved. Option 3 new road has steep gradients and high altitude will be prone to adverse weather.
9	Economy inc TP01 - Average Journey Times (combine with 9)	15.000	3	45.000	1	15.000	2	30.000	NESA and QUADRO. Option 1 - NPV of -£82.24m and a BCR of 0.22. Option 2 - NPV - -£113.64 and BCR of 0.07, Option 3 - NPV - -£171.77 and BCR of 0.19.
10	Integration inc TP04 - NMU Infrastructure (combined with 10,11)	5.000	3	15.000	2	10.000	1	5.000	Option 1 improves integration conditions for existing communities, Option 2 partially and Option 3 to little extent.

A82 Upgrade: VE WORKSHOP January 2014									
	OBJECTIVES	Options	Option 1		Option 2		Option 3		Comments
		Weighting (%)	Existing A82 Corridor		Arrochar to Inveruglas to Inverarnan		High Road		
			Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	Scoring: 3 is first and 1 is last
11	**Accessibility and social inclusion inc TP04 - NMU Infrastructure (combined with 10,11)**	5.000	3	15.000	2	10.000	1	5.000	Option 1 - Provides improvements to existing route, Option 2 provides improvements to part of route, Option 3 new route may not provide improvement along existing corridor
12	**Engineering**	12.500	1	12.500	1	12.500	1	12.500	Option 1 route through existing corridor, significant engineering challenges along shoreline, Option 2 - Engineering challenges as per option 1 though new off-line route south of Inveruglas and crossing of Inveruglas water, new route Option 3 - likely require considerable earthworks and some major structures but off-line. Different challenges.
13	**Affordability**	7.500	3	22.500	2	15.000	1	7.500	Option 1 - £204.75m, PVC 105.24, Option 2 - £234.00m, PVC 122.15, Option 3 - £397.80m, PVC 210.88
14	**Public acceptability**	10.000	3	30.000	2	20.000	1	10.000	Option 1 corridor already established and preferred at Stakeholder Workshop. Option 2, partial new off-line route, detours to Arrochar. Option 3, new route, environmental imapacts but was proposed by some attendees at Stakeholder Workshop.
	Total objectives weighting as %	**100**							
		Value Index		245.000		180.000		160.000	
		Ranking		1st		2nd		3rd	

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3 Risk Management

Session 2 of the workshop considered Risk Management. Twenty-Eight risks were identified that affected the preferred corridor - Option 1 Existing A82 Road. Of these, five were identified as significant. However, with the application of mitigation proposals these significant risks reduced to two. These are traffic management during construction and financial reputation.

A Risk matrix was developed at the workshop. The final Risk matrix is shown on the following page.

RISK							CURRENT MITIGATING CONTROLS				FURTHER ACTIONS		
Risk No.	Risk Type	Inherent			Risk Description	Risk Owner	Mitigating Controls	Residual			Further Actions	Further Action Owners	Target Date
		Risk Likelihood 1-5	Risk Impact 1-5	Risk				Risk Likelihood 1-5	Risk Impact 1-5	Risk			
1	A - 3rd Parties	2	4	**8**	Change in Designations e.g. SSSI's, SINC's, Historic Monuments designation, TPO's	CFJV	1. Monitor during Stage 1 and Stage 2.	*1*	4	**4**	Consultation with relevant statutory bodies	[REDACTED]	
2	A - 3rd Parties	2	2	**4**	Potential impact of Architecture Design Scotland comments	CFJV	1. Monitor during the development of Stage 1 and Stage 2. Develop strategy with ADS	1	2	**2**	Liaise with ADS	[REDACTED]	
3	A - 3rd Parties	3	3	**9**	Landowners objection to the scheme	CFJV	1. Establish communication and early agreement. Factor in PLI into programme	2	2	**4**	Visit/Consult land owners	[REDACTED]	
4	A - 3rd Parties	3	3	**9**	Non statutoy s objection to the scheme	CFJV	1. Establish communication and early agreement. Factor in PLI into programme	2	2	**4**			
5	A - Approvals	3	3	**9**	Network Rail prolonged consultation/approvals	CFJV	1. Ensure early consultation with Network Rail during Stage 1 and Stage 2. Avoid affect on rail corridor 2. If necessary, chase responses.	*2*	2	**4**	Liaise with local NR contact	[REDACTED]	
6	A - Approvals	1	4	**4**	Changes in standards	CFJV	1. Monitor during the development of Stage 1 and Stage 2.	1	4	**4**			
7	A - Approvals	1	3	**3**	Standards Branch do not agree to a reduction of standards.	CFJV	1. Monitor and review during Stage 1 and Stage 2.	1	3	**3**			
8	A - Approvals	2	3	**6**	Footprint is too constrained to allow SuDS features to be incorporatd into the drainage.	CFJV	1. Monitor and review during Stage 1 and Stage 2. Early development of drainage strategy to inform road alignments and agreement/liaison with SEPA	1	3	**3**	Develop drainage strategy	[REDACTED]	
9	B - Statutory Undertakers	3	3	**9**	Statutory undertakers responses	CFJV	1. Ensure early consultation with Statutory Undertakers during Stage 1 and Stage 2. 2. If necessary, chase	3	3	**9**	Engage with Water, BT, Electricity etc	[REDACTED]	

RISK							CURRENT MITIGATING CONTROLS				FURTHER ACTIONS		
Risk No.	Risk Type	Inherent			Risk Description	Risk Owner	Mitigating Controls	Residual			Further Actions	Further Action Owners	Target Date
		Risk Likelihood 1-5	Risk Impact 1-5	Risk				Risk Likelihood 1-5	Risk Impact 1-5	Risk			
							responses.						
10	B - Statutory Undertakers / 3rd Parties	3	4	**12**	Potential objections from Statutory Consultees	CFJV	1. Taking cognisance of previous consultations ensure further consultation is carried out at an early stage and then continued as necessary with statutory consultees. (Workshops, etc) 2. Ensure where realistic consultees concerns have been taken into account or concerns allayed.	2	4	**8**	Run workshops in March and Q4 2014	[REDACTED]	
11		2	3	**6**	Potential affect on private apparatus.	CFJV	1. Ensure early consultation with Statutory Undertakers during Stage 1 and Stage 2. 2. If necessary, chase responses.	1	3	**3**	Identify potential apparatus and engage	[REDACTED]	
12	C - Environment	3	3	**9**	protected species issues	CFJV	1. Carry out surveys at earliest opportunity during Stage 1 and Stage 2. Add to project programme	*2*	3	**6**			
13	C - Environment	3	3	**9**	Unacceptable Impact on Ecology, Habitat / Landscape Character	CFJV	1. Carry out surveys at earliest opportunity during Stage 1 and Stage 2.			**0**			
14		5	2	**10**	Invasive Species	CFJV	identify location, manage, programme	*1*	2				
15	C - Environment	2	2	**4**	Unexpected archaeological finds during construction	CFJV	1. Monitor during survey works.	*1*	2	**2**			
16	C - Environment	2	2	**4**	Failing to Take account of climate change	CFJV	Comply with standards. Recognise any changes in policies. Consider flooding etc.	*1*	2	**2**			
17	C - Environment	2	2	**4**	Failing to Take account of sustainability	CFJV	Comply with standards, consider during design, sustainability methodolodgy. Carbon management tool.	*1*	2	**2**			
18	C - Environment	4	3	**12**	Affect on the flood plain / hydrology / hydrogeology.	CFJV	consider during design.early Drainage strategy study to assess	*2*	2	**4**	Develop drainage strategy	[REDACTED]	

RISK							CURRENT MITIGATING CONTROLS				FURTHER ACTIONS		
Risk No.	Risk Type	Inherent			Risk Description	Risk Owner	Mitigating Controls	Residual			Further Actions	Further Action Owners	Target Date
		Risk Likelihood 1-5	Risk Impact 1-5	Risk				Risk Likelihood 1-5	Risk Impact 1-5	Risk			
							impacts. Early engagement with SEPA / BGS						
19	D - Ground conditions	1	3	3	Mine workings	CFJV	1. Following review of available GI information make an informed assessment of any impact from any mine workings. 2. Following targeted GI make an informed assessment of any impact from any mine workings.	*1*	2	2			
20	D - Ground conditions	2	3	6	Potential for increasing Landslide risk	CFJV	Consider landslide action plan. (Morag MacKay). Understand existign hydrology and affect of railline. Undertake appropriate geotechnical investigation.	*1*	3	3			
21	N	2	3	6	Land not available for the scheme (eg compensatory storage / enviornmental mitigation etc)	CFJV	Consider footprint, liaise with consultess to understand issues.	*1*	3	3			
22	D - Ground conditions	4	3	12	Ground water conditions	CFJV	1. Following review of available GI information make an informed assessment of any impact from ground water conditions. 2. Following targeted GI make an informed assessment of any impact from ground water conditions.	2	2	4			
23	G - Technology / Comms / Lighting	3	2	6	Futureproofing communications	CFJV	Consider ITS requirements early. Consider broadband infratructure. Lisaise with relevant parties.	2	2	4			
24	H - Traffic Management during construction	5	3	15	Buildability and affect on traffic during construction	CFJV	Consult with public early on. Early consideration of buildability / design out.	4	3	12			
25	I - Access	2	2	4	Private services etc. (including water extraction)	CFJV	1. Ensure early consultation with private	*1*	2	2			

RISK							CURRENT MITIGATING CONTROLS				FURTHER ACTIONS		
Risk No.	Risk Type	Inherent			Risk Description	Risk Owner	Mitigating Controls	Residual			Further Actions	Further Action Owners	Target Date
		Risk Likelihood 1-5	Risk Impact 1-5	Risk				Risk Likelihood 1-5	Risk Impact 1-5	Risk			
							service provider during Stage 1 and Stage 2. 2. If necessary, chase responses.						
26	L - Financial	2	3	**6**	Cost for disposal of contaminated excavated material	CFJV	1. Following a review of available GI information and the completion of GI works make an informed assessment on the likelihood of any contaminated material.	*1*	3	**3**			
27	L - Financial	2	3	**6**	Material price increases over and above inflation, e.g. oil, steel, fill materials	CFJV	1. Monitor and update TS in line with market changes.	2	3	**6**			
28	L - Financial	2	3	**6**	Changes in landfill tax and aggregate tax	CFJV	1. Monitor and update TS in line with market changes.	2	3	**6**			
29	L - Financial	2	3	**6**	Land cost increase	Transport Scotland	1. Obtain an update from Valuation Office and update base estimate.	2	3	**6**			
30	L - Financial	3	3	**9**	GI/Surveys costs	Transport Scotland	Early consideration	2	3	**6**			
31	L - Financial	2	3	**6**	Costs associated with any compensation payments	Transport Scotland	1. Monitor during Stage 1 and Stage 2.	2	2	**4**			
32	L - Financial/ Reputation	4	4	**16**	Overall lack of affordability of scheme.	Transport Scotland	1. Review scheme costs as improvement options are developed. Consider construction phasing 2. Continue to advance the case for inclusion in Transport Scotland's capital Trunk Road portfolio.	*3*	4	**12**			
33	L - Market/ Reputation	2	3	**6**	Failure to maintain sufficient competition during procurement.	Transport Scotland	1. Monitor and review market place.	2	3	**6**			

RISK							CURRENT MITIGATING CONTROLS				FURTHER ACTIONS		
Risk No.	Risk Type	Inherent			Risk Description	Risk Owner	Mitigating Controls	Residual			Further Actions	Further Action Owners	Target Date
		Risk Likelihood 1-5	Risk Impact 1-5	Risk				Risk Likelihood 1-5	Risk Impact 1-5	Risk			
34	M - Programme Issues	3	3	9	Traffic management for surveys may be extensive and disruptive.	CFJV	1. Monitor during the development of Stage 1 and Stage 2. Liaise with TS/opearating company	2	2	4			
35	M - Programme Issues	3	3	9	Delay in obtaining supplementary GI results.	CFJV	1. Monitor and review during Stage 1 and Stage 2.	2	3	6			
36	M - Programme Issues	3	3	9	Adverse weather during surveys	Contractor	1. Monitor during construction phase.	3	3	9			
37	O - General/Reputation	3	3	9	Adverse public relations during traffic management.	Contractor	1. Monitor during works.	3	3	9			

Appendix A

Information Pack

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A82 Tarbet to Inverarnan Upgrade

Value Engineering & Risk Workshop

Workshop Information Pack

Transport Scotland

January 2014

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A82 Tarbet to Inverarnan Upgrade

Value Engineering & Risk Workshop

Workshop Information Pack

Transport Scotland

January 2014

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A82 Tarbet to Inverarnan

Value Engineering & Risk Workshop – Workshop Information Pack

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1.0	15.01.14	Draft	[REDACTED]	[REDACTED]	[REDACTED]

Contents

Appendices

1 Introduction

A half day DMRB Stage 1- Value Engineering and Risk Workshop for the A82 Tarbet to Inverarnan Upgrade will be held on 22nd January 2014 with representatives of Transport Scotland and their consultant, CH2MHill-Fairhurst JV (CFJV).

Transport Scotland requires a facilitator to manage the VER workshop. [REDACTED] from the CFJV project team has been appointed to facilitate the workshop.

The workshop has been preceded by a pre-workshop preparation meeting between TS and HFJV on 20th January 2014. This short document, 'The Workshop Handbook', presents to all workshop participants the critical issues which were discussed at that meeting.

This handbook is not intended to be a highly technical document. Details describing the methodology to be adopted and the techniques to be used will be explained during the workshop.

[REDACTED] will be supported by a recorder (a member of the CFJV admin staff) to record discussions and outcomes from the workshop. [REDACTED] is a skilled facilitator for group problem solving and partnering; it will be his job to ensure that optimal results are achieved from and within the experience and expertise of the participants.

The workshop will be held at the offices of CFJV at City Park, Glasgow. The workshop commences at 9am.

It is hoped that attendees will contribute in a constructive and open way to the workshop.

2 Agenda

The agenda timings are flexible but all elements will be included.

8.45 Coffee

9.00 Introductions

- Introductions, objectives, process, agenda, rules & roles

9.05 Information

- Background to Scheme & Current Status – [REDACTED] (5mins)
- The preferred scheme, costs and overall programme – [REDACTED] (15-20mins)

Questions & Answers

9.40 Value Engineering Review

- Structured review of all aspects of the scheme of VE issues included in draft VE log produced pre-workshop by CFJV which could include:
  1. Confirmation of Scheme Objectives and their weighting.
  2. Assessment of each option against the weighted objectives.
  3. Identification of any value engineering issues to be considered at Stage 2.

Agree actions arising for Stage 2.

10.30 Coffee

10.40 Value Engineering Review cont'd

11.15 Scheme Risk Register

- Review of identified risks and generation of additional risks as necessary.
- Review of Probability x Impact assessment including refinement as necessary.
- Undertake preliminary risk quantification based on risk assessment values.
- Review of Top Risks mitigation actions

12.45 Workshop Summary and Actions

- Way Forward for the study process
- Actions Arising from workshop– Who? What? When?

13.00 Workshop Close

3 The Workshop

3.1 A82 Tarbet to Inverarnan Upgrade

3.1.1 Background

Halcrow Fairhurst Joint Venture (CFJV) was appointed by Transport Scotland in June 2013, under the 'A82 Tarbet to Inverarnan, A Single-Supplier Framework Agreement for Provision of the Design, Investigative and Environmental Services', to carry out the necessary works to complete a Design Manual for Roads and Bridges (DMRB) Stage 1 and Stage 2 Assessment for the proposed upgrade of a section of the A82 Trunk Road between Tarbet and north of Inverarnan. The framework agreement allows for further stages to be undertaken pending availability of funding and appropriate commitment from Scottish Ministers

The study area covers a length of approximately 17km from a point just south of Tarbet (end of 30mph speed restriction) to a point approximately 800m north of Inverarnan where the carriageway cross section widens to 7.3m with near standard verge widths.

Figure 1.1 indicates the extents of the study area

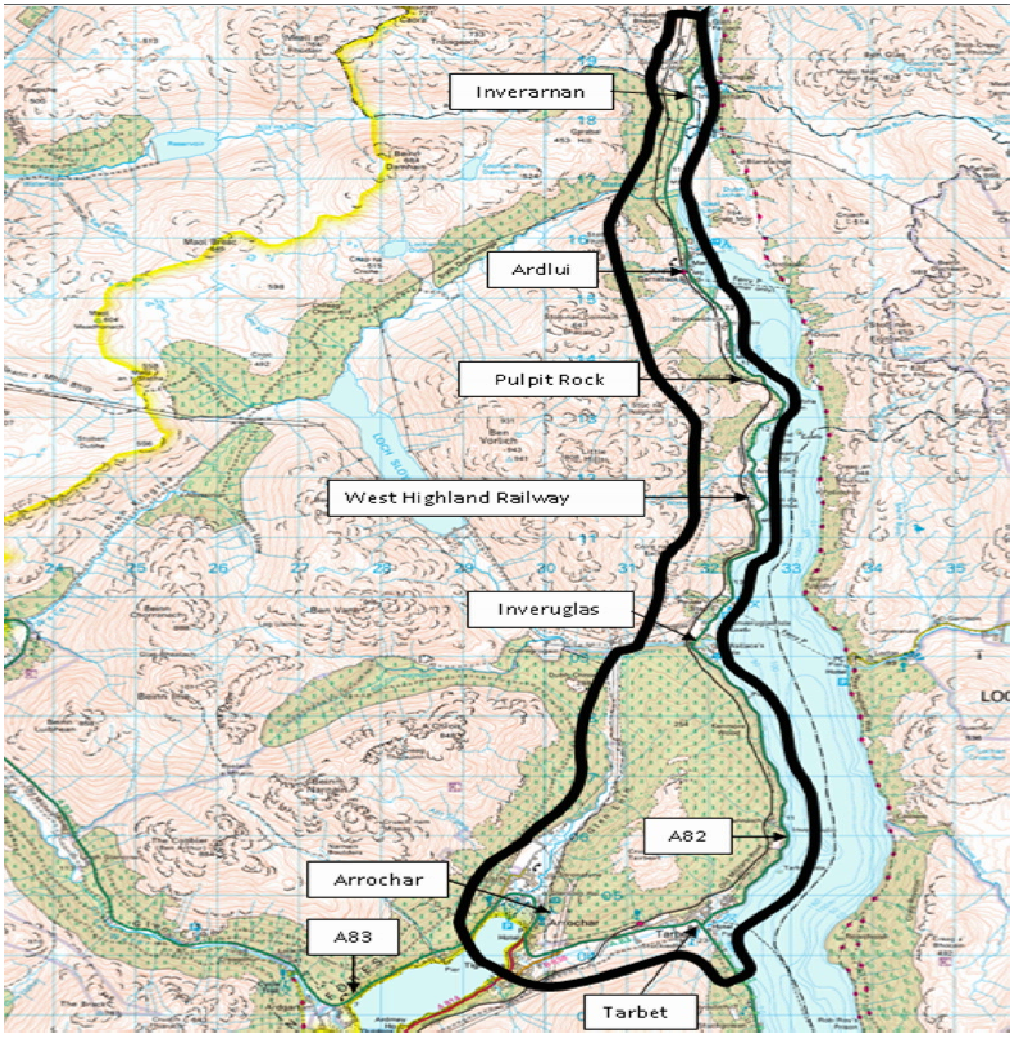


Figure 1.1 – Study Area

3.1.2 Proposed Scheme Details

The A82 trunk road is considered to be an economic lifeline not only to the communities directly served by the route, but also to the wider region to the west and North West of Scotland.

As identified in the DMRB Stage 1 Report and the Strategic Business Case (SBC), there are three corridor options being recommended as potential improvement strategies. These can be summarised as follows:

- Option 1 – Existing A82 Corridor (Tarbet to Inverarnan) - On-line improvement of the existing A82 alignment.
- Option 2 – Arrochar to Inveruglas to Inverarnan - New road from Arrochar to Inveruglas, connecting into an on-line improvement of the A82 alignment from Inveruglas to Inverarnan. The alignment from Inveruglas to Invernanan will be the same as that noted in Option 1.
- Option 3 – High Road (Tarbet to Geal Loch to Inverarnan) - This option proposed the construction of a new road located at a high level, west of the West Highland Railway line, and is located to the west of the existing A82 alignment.

The corridor options outlined shall be in accordance with the Government's appraisal criteria for the assessment of trunk road schemes, which take account of integration, economy, safety, environment, social inclusion and accessibility impacts. Following the preparation of a Strategic Business Case, the following key transport planning objectives were identified:-

- To improve average journey times for A82 trunk road users between Tarbet and Inverarnan (based on observed post Pulpit Rock scheme);
- To reduce personal injury accident numbers and their severity on the A82 between Tarbet and Inverarnan to be closer to or better than national KSI rates;
- To provide appropriate stopping opportunities for visitors and for all trunk road users on the A82 between Tarbet and Inverarnan taking account of the unique setting of the route within the National Park.
- Seek to provide opportunities for enhanced access by sustainable modes of travel along the A82 corridor between Tarbet and Inverarnan; and
- To reduce disruption to road users resulting from the undertaking of maintenance activities on the A82 between Tarbet and Inverarnan.

Further details of the scheme objectives can be found in the Strategic Business Case.

3.2 Summary of scheme costs and programme

The table below provides an estimate of costs at 2012 prices with an optimism bias of 44%.

Table 3.1 – Outline Cost Estimate (Approx)

Route Option	Outline Cost Estimate
1	**£175m**
2	**£200m**
3	**£340m**

The current overall programme milestones for the scheme are as follows:

- Prepare Draft Inception Report – Completed July 2013
- Transport Scotland Review and Comment – July 2013
- Issue Final Inception Report to Transport Scotland – August 2013
- Develop Draft Strategic Business Case – Completed November 2013
- DMRB Stage 1 – Prepare Draft Stage 1 Report – Completed November 2013
- DMRB Stage 1 – Draft Environmental Report – November 2013
- DMRB Stage 1 – Preliminary Traffic and Economic Appraisal Report – Nov 2013

3.3 Workshop Objectives

As part of developing the scheme and in accordance with TS Value for Money (VfM) procedures, a workshop has been convened to undertake a value engineering review and risk assessment of the preferred scheme. The workshop will comprise:

Value Engineering

As the form of procurement is likely to be Design and Build the VE will address the following:

- Confirmation of specific Stage 1 objectives and their weighting.
- Assess each option against the weighted objectives.
- Identification of any particular value engineering issues to be considered during Stage 2 that arise from discussions.

Agree any actions arising for Stage 2.

The design consultants will produce a draft VE issues log for this session before the workshop and this will be used to help make best use of the time available.

Risk

The risk process will include a review of the project risk register and specifically:

- Review identified risks and generation of additional risks as necessary.
- Review probability x Impact assessment including refinement as necessary.
- Undertake a preliminary risk quantification based on risk assessment values.
- Review Top Risks, mitigation actions
- Review Top Risks for contract allocation.

A draft risk register will be produced by the design consultants before the workshop and participants will use this as a basis for the review.

An explanation of the VE and risk process is given in Section 5.

4 Workshop Logistics

4.1 Participants

The Following Participants will be attending the workshop:

Name	Organisation	Email
[REDACTED]	Transport Scotland	[REDACTED]
[REDACTED]	Transport Scotland	[REDACTED]
[REDACTED]	Transport Scotland	[REDACTED]
[REDACTED]	Transport Scotland	[REDACTED]
[REDACTED]	Transport Scotland	[REDACTED]
[REDACTED]	Transport Scotland	[REDACTED]
[REDACTED]	Transport Scotland	[REDACTED]
[REDACTED]	Transport Scotland	[REDACTED]
[REDACTED]	Transport Scotland	[REDACTED]
[REDACTED]	Transport Scotland	[REDACTED]
[REDACTED]	CFJV	[REDACTED]
[REDACTED]	CFJV	[REDACTED]
[REDACTED]	CFJV	[REDACTED]
[REDACTED]	CFJV	[REDACTED]

[REDACTED]	**CFJV**	**[REDACTED]**
[REDACTED]	**CFJV**	**[REDACTED]**
[REDACTED]	**CFJV**	**[REDACTED]**

4.2 Capital Value & Risk Team

Facilitator: [REDACTED]

Assistant: TBC

4.3 Workshop Venue

The workshop will be held at the offices of CFJV , City Park, Glasgow.

4.4 Presentations

During the workshop there will be succinct presentations on the scheme and options in order to enable all participants to gain an understanding of the scheme and the critical issues pertaining thereto.

5 The Process

5.1 The Participants

In order for the workshop to be successful, total commitment is required from each individual. Therefore, it is of fundamental importance that:

- Everybody contributes fully.
- Political and seniority barriers are ignored.
- Everyone tables all their ideas or reservations on every issue.
- The focus of the discussions is maintained without diversions.
- The correct level of detail is maintained without dropping into too much detail or glossing over important items.
- Everyone participates in fully in the activities.
- It is a 'No Blame' culture. We are looking for participation, not victims.

In order to achieve full concentration with no distraction, all participants are expected to:

- Attend for the whole duration.
- Switch off all mobile phones and pagers.
- Give others the chance to speak without interruption.
- The Workshop is intense and hard work and requires a high level of concentration. Therefore, participants should feel free to dress comfortably.

5.2 The Facilitator

[REDACTED] is a professional facilitator. He does not bring any answers to the group; he only brings a process.

It is the facilitator's role to ensure that the expertise of the participants is utilised and all relevant information made available to enable fully informed discussions to take place.

5.3 Value Engineering

Value engineering is used to search for an optimal design solution. It is a systematic procedure directed towards the achievement of required functions at least cost. It is a problem-solving methodology that provides a process by which the design objective can be challenged to make sure it is correctly expressed.

One of the features of value engineering is that a design or initial solution is generally in place prior to undertaking the process. This initial design is used throughout the value engineering process to generate optional approaches.

5.4 Project risk assessment process

The process of the risk assessment process follows a 4-step process:

- Identification –what might go wrong?
- Risk Assessment – initial consideration of likelihood and impact using a Probability x Impact Matrix for each option.
- Risk Quantification based on the initial risk assessment cost impacts.
- Risk Management for Stage 2.

The following sub-sections provide details of the above steps in the risk assessment process.

5.4.1 Risk identification

The group collectively brainstorms a range of potential issues that might go wrong on the project – known as project risks. To assist the process of brainstorming "what might go wrong" the group utilises a risk categorisation agenda to ensure a full range of areas is explored. The following risk categorisation agenda is typically used:

Risk Generation Categories:

A 3rd Parties/Approvals including PI issues/commitments

B Statutory Undertakers

C Environmental Issues

D Ground conditions/Earthworks

E Structures

F Roadworks/Drainage

G Technology/Comms/Lighting

H Traffic Management during construction

I Construction Site Control/Access/Logistics/Phasing

J Advance Works

K Accommodation Works

L Financial/Market/Inflation

M Programme Issues

N Land/Compensation

O General/Other

5.4.2 Risk Assessment

The following assessment matrix will be adopted:

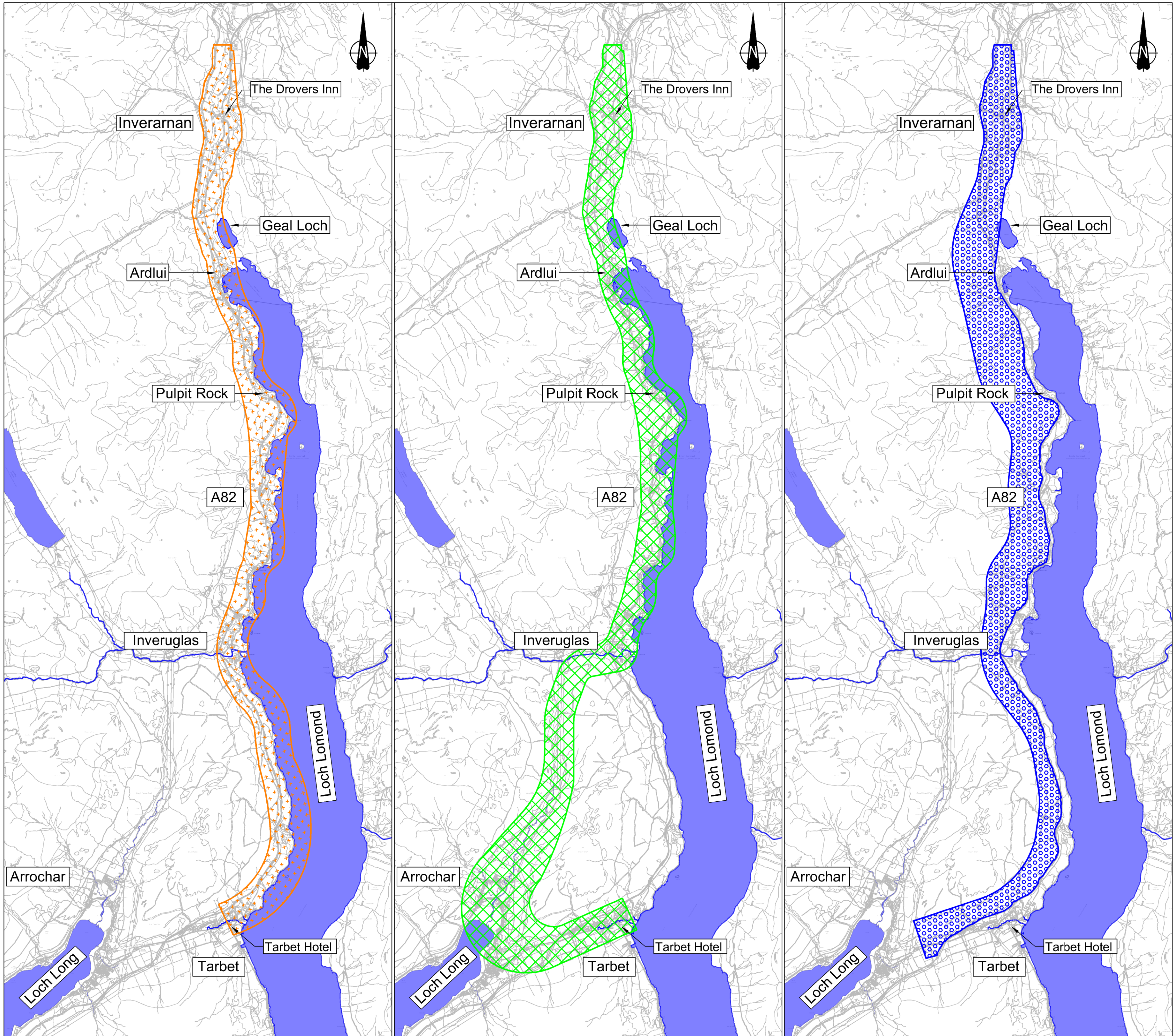
Probability	Very High	5	10	15	20	25
80-100%	5					
65-80%	High 4	4	8	12	16	20
35-65%	Medium 3	3	6	9	12	15
15-35%	Low 2	2	4	6	8	10
0-15%	Very Low 1	1	2	3	4	5
	Impact	Very Low 1	Low 2	Medium 3	High 4	Very High 5
= HIGH RISK	Cost	<£50K	£50K-£150K	£150K-£500K	£500K-£1,000K	>£1,000K
=MEDIUMRISK	Time	<2 weeks	2wks – 1 month	1-3 months	3-6 months	6 months +
=LOW RISK						

The risk assessment will also be used as basis to quantify the risks.

Risk mitigation measures and contract allocation will also be included in the risk workshop.

Appendix A

Route Option Drawings



Key:

- Option 1 Orange Corridor
- Option 2 Green Corridor
- Option 3 Blue Corridor

Revision	By	Checked	Approved	Date	Description
1.0	MC	EN	EC	11.12.13	Draft stamp removed.

Client

TRANSPORT SCOTLAND
An agency of The Scottish Government

CH2MHILL. Halcrow
FAIRHURST

Project

A82 TARBET TO INVERARNAN UPGRADE

Drawing

CORRIDOR LOCATIONS

Drawn by: M COLAHAN Date: 20.11.13

Checked by: E NICOLSON Date: 22.11.13

Authorised by: E CRAWFORD Date: 22.11.13

Drawing No. **476416-0000-016**

Revision **1.0**

Drawing Scale: N.T.S.

CAD Filename:

Plot Scale: 1 : 1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