



TRANSPORT SCOTLAND
SCOTTISH TRUNK ROAD INFRASTRUCTURE
PROJECT EVALUATION

Evaluation Report for Trunk Road Projects
Opened between April 09 and March 10

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GLOSSARY

The following abbreviations have been used in this report:

AADT	Annual Average Daily Traffic
ATC	Automatic Traffic Counter
BCR	Benefit to Cost Ratio
DMRB	Design Manual for Roads and Bridges
HITRANS	Highlands and Islands Transport Partnership
NPV	Net Present Value
NRTF	National Road Traffic Forecasts
RSA	Road Safety Audit
S2	Single 2-Lane Carriageway
STAG	Scottish Transport Appraisal Guidance
WS2	Wide Single 2-Lane Carriageway

INTRODUCTION



SCOTTISH TRUNK ROAD INFRASTRUCTURE

PROJECT EVALUATION

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1 INTRODUCTION

1.1 Background to Project Evaluation

Road infrastructure projects normally take a minimum of 5 to 7 years to plan prior to the commencement of construction and it is not possible to know exactly what will happen when a project is opened, nor what would have happened had the project not been built, particularly when the project is opened a number of years after its assessment.

The aims of evaluation, as set out in the Design Manual for Roads and Bridges (DMRB), Volume 5, SH 1/97 „Traffic and Economic Assessment of Road Schemes in Scotland’, are as follows:

- to satisfy the demands of good management and public accountability by providing the answers to questions about the effects of a new or improved road;
- to identify the strengths and weaknesses in the techniques used for appraising projects, so that confidence in the roads programme is maintained;
- to allow the predictive ability of the traffic or transport models used to be monitored to establish whether any particular form of model is consistently more reliable than others when applied to particular types of projects; and
- to assist in the assessment of compensation under Part 1 of the Land Compensation (Scotland) Act 1973 for depreciation due to the physical factors caused by the use of public works.

The evaluation of trunk road projects is evolving as Transport Scotland improves its process and reporting to reflect the principles of monitoring and evaluation set out in the Scottish Transport Appraisal Guidance (STAG).

STAG advocates evaluation against indicators and targets derived for the Transport Planning Objectives originally set for the project, STAG criteria (Environment, Safety, Economy, Integration and Accessibility & Social Inclusion) and relevant policy directives, the aim of which is to identify:

- whether the project is performing as originally intended;
- whether, and to what extent, it is contributing to established policy directives; and
- whether the implemented project continues to represent value for money.

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1.2 Projects Reported

The *Evaluation Report for Trunk Road Projects Opened between April 09 and March 10* presents the evaluations undertaken for projects costing over £5m that were completed and opened to traffic in the 2009/10 financial year.

The projects evaluated in this report are listed in Table 1.1 and their locations are shown in Figure 1.1.

Table 1.1 Projects Opened Between April 09 and March 10

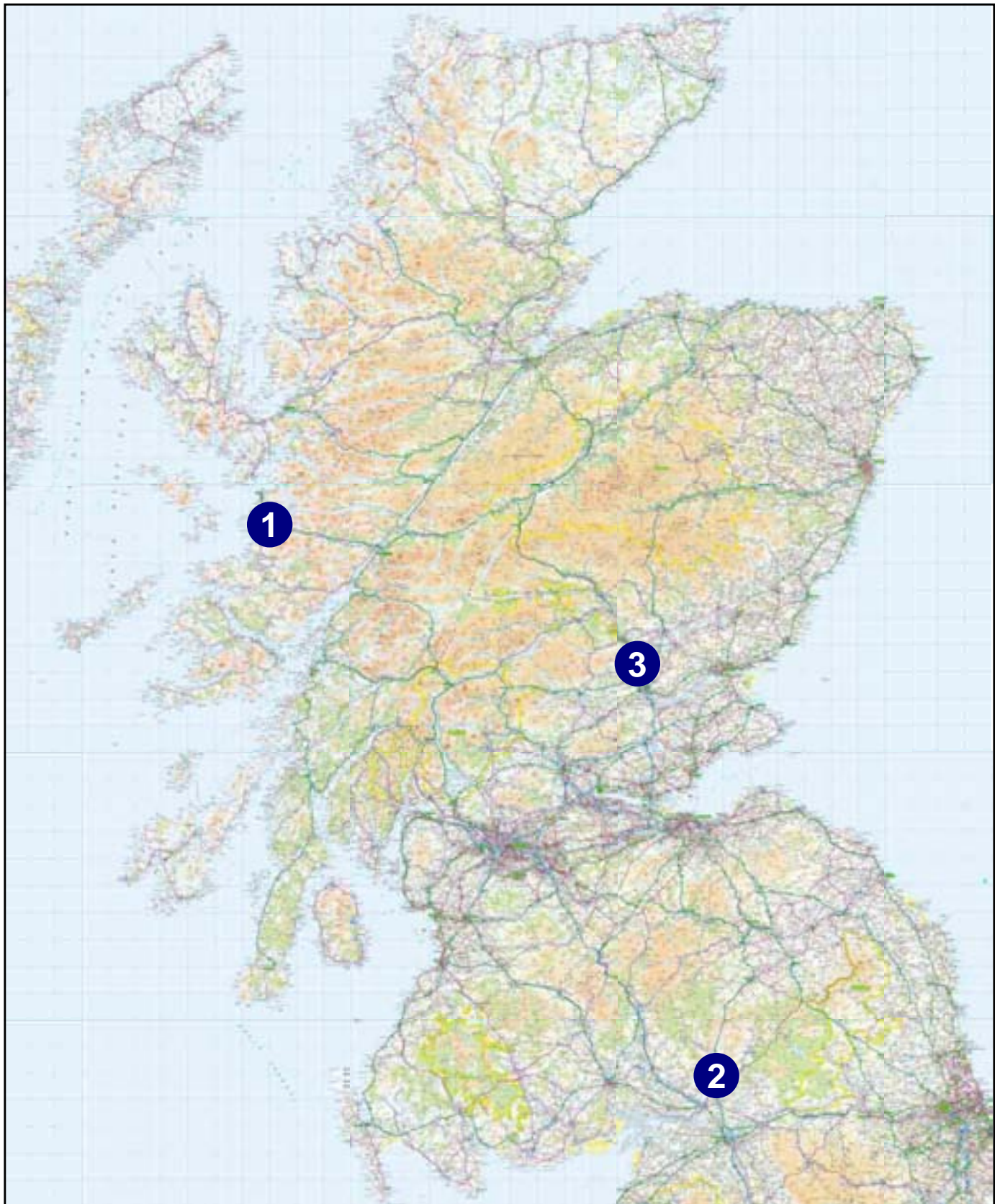
Route	Project Name	Standard	Length (km)	Open to Traffic
A830(T)	Arisaig to Loch Nan Uamh	S2	7.5	April 09
A7(T)	Auchenrivock	S2 & WS2	2.3	June 09
A9(T)	Bankfoot	Junction improvement		August 09

Key: S2 Single 2-Lane Carriageway
WS2 Wide Single 2-Lane Carriageway

The A830(T) Arisaig and Loch Nan Uamh project involved the upgrade of 7.5 kilometres of single track road with passing places to 2-lane single carriageway standard. The A7(T) Auchenrivock project involved the off line construction of 1.6 kilometres of single 2-lane carriageway and 1.7 kilometres of wide single 2-lane carriageway. The A9(T) Bankfoot junction improvement was delivered as part of a series of improvement along the A9(T) corridor and included the removal of right turn manoeuvres across the main carriageway through improvements to the existing A9(T)/B867 junction and the realignment of a minor road to the north.

Chapter 2 of this report presents the methodology and data sources used in the evaluations of projects that opened between April 09 and March 10. Chapter 3 provides a summary of the evaluations and the key findings are presented in Chapter 4.

Full details of the evaluations for the projects are contained in Appendix A.



- 1. A830(T) Arisaig to Loch Nan Uamh
- 2. A7(T) Auchenrivock
- 3. A9(T) Bankfoot

Locations of Projects Evaluated
Figure 1.1

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METHODOLOGY AND DATA SOURCES



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2 METHODOLOGY AND DATA SOURCES

2.1 Overview

The projects presented in this report have been evaluated against their objectives and the following criteria, where applicable, to support the evaluation:

- Environment;
- Safety;
- Economy;
- Integration;
- Accessibility & Social Inclusion;
- Costs to Government; and
- Value for Money.

As the evaluations focus on impacts relating to the project's objectives, evaluations against all of the above criteria may not be undertaken for all projects. The evaluations are supported by the consideration of network traffic indicators, including traffic volumes, overtaking opportunities and travel times, as presented in the following section.

2.2 Network Traffic Indicators

Traffic Volumes

Comparison Between Pre and Post Opening Traffic Flows

A comparison of traffic flows pre and post opening has been undertaken for all projects to provide an indication of the impact that the project has had on traffic volumes. The amount of traffic data presented is dependent upon the complexity of the project. The comparison can also serve as a proxy for the effect that the project has had on noise and air quality.

Comparison Between Predicted and Actual Traffic Flows

A comparison of predicted and actual opening year traffic flows has been undertaken for all projects to confirm the accuracy of predictions during the project's preparation. The comparison can also serve as a proxy for whether the predicted benefits of the project are likely to be realised.

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Depending on the nature of the traffic modelling undertaken to assess the project, the predicted traffic flow is either derived by:

- factoring the base year or the predicted opening year, design network flows to the actual opening year using National Road Traffic Forecast (NRTF) growth factors; or
- extrapolating from, or interpolating between, the modelled assessment year, design network flows.

The difference between the actual traffic flow and the predictions has been calculated and expressed as a percentage of the actual flow. A threshold of +/-20% is generally accepted by Transport Scotland as being a reasonable range for future year forecast traffic flow comparisons.

The amount of traffic data presented is dependent upon the complexity of the project. The comparison can also serve as a proxy for the likely impact of the project on noise and air quality.

Data Sources

Predicted Traffic Flows	Obtained/derived from the traffic/economic modelling undertaken to support the pre-tender economic assessment.
Actual Traffic Flows	Obtained from automatic traffic counters in the vicinity of the project/study area.

Carriageway Standard Assessment

A carriageway standard assessment has been carried out for all projects (excluding junction improvements) using DMRB, Volume 5, TA 46/97 – Economic Assessment and Recommended Flow Ranges for New Rural Road Links, which applied at the time of the project's design, to determine the appropriateness of the carriageway standard constructed based on the opening year flow.

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Overtaking Opportunities

Post Opening Overtaking Opportunities

Where no overtaking information is available, the impact of providing increased overtaking opportunities has been based on the evaluation of other projects with a comparable standard of carriageway in the same geographic region for which overtaking surveys have been carried out.

Anecdotal, qualitative evidence from stakeholders has also been gathered, where available.

Data Sources

Post Opening Overtaking Conditions	Judged from post opening survey information for other projects.
Stakeholder Feedback	Obtained from Dumfries and Galloway Council.

Travel Times

Change in Travel Times

Based on the evaluation of other projects with a comparable standard of carriageway for which pre and post opening journey time data is available, supported by anecdotal evidence where available.

Comparison Between Pre and Post Opening Travel Times

A comparison between pre and post opening travel times has been carried out for projects where the change in travel times cannot be judged based on other projects of a similar nature for which an evaluation has been undertaken.

Comparison Between Predicted and Actual Travel Times

A comparison between predicted and actual opening travel times has been carried out for projects where predicted and post opening travel time information is readily available.

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Data Sources

Pre Opening Travel Times	Confirmed through pre opening survey information collected to support the project's economic assessment.
Post Opening Travel Times	Confirmed through post opening survey information.
Predicted Travel Times	Obtained from the pre-tender economic assessment undertaken during the project's preparation.
Stakeholder Feedback	Obtained from Shiel Buses and Dumfries and Galloway Council.

2.3 Environmental

Mitigation Measures

A review of the environmental mitigation measures implemented during construction has been undertaken for all projects to establish whether or not the measures proposed during the project's preparation have been introduced and to provide comment on their success. The mitigation measures implemented were confirmed through site visits.

Data Sources

Proposed Mitigation Measures	Presented in the Environmental Statement produced during the project's preparation.
Implemented Mitigation Measures	Confirmed through site visit.

Noise and Air Quality

A review of noise and air quality has not been undertaken for the projects that opened between April 09 and March 10 as no significant impacts on noise and air quality were expected.

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2.4 Safety

Accidents

Comparison Between Pre and Post Opening Personal Injury Accident Numbers

A comparison of the personal injury accident numbers pre and post opening has been undertaken for all projects to provide an early indication of whether the project is operating safely.

The number of personal injury accidents for the 3 years within the vicinity of the project prior to opening has been compared with the observed number of personal injury accidents for the project in its first year of operation. The comparison shall be updated to include the observed number of accidents in the three year period after opening when the accident data is available.

It is important to realise that road infrastructure projects normally take a minimum of 5 to 7 years to plan prior to the commencement of construction. Many proposed road projects are derived from safety concerns such as fatal and serious accidents and often, these are treated in terms of Accident Investigation and Prevention work prior to planning the permanent solution. The comparison between 3 year pre and post opening accidents, therefore, only demonstrate the minimum road safety improvement derived from the project.

Where the influence of a trunk road improvement project has a significant impact on the local road network, it may be appropriate to extend the scope of the accident analysis.

Road Safety Audits

Road Safety Audit (RSA) reports have been reviewed for all projects, where available, to confirm whether there is any evidence that the project is not operating safely and where recommendations have been made for ameliorative measures, if appropriate.

Data Sources

Personal Injury Accident Numbers	Obtained from the STATS19 data collection system.
Safety Issues	Detailed within RSA reports produced following audits carried out 1 year after project opening.

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2.5 Economy

Transport Economic Efficiency

A comparison between predicted and actual traffic flows and/or travel times has been undertaken for all projects as a proxy for whether the predicted benefits of the project are likely to be realised.

A comparison which returns a positive traffic flow difference in an uncongested situation indicates that the economic benefits of the project may have been over predicted as fewer vehicles will actually accrue journey time savings than predicted. Similarly, the economic benefits of a project may also be over predicted where actual travel times are greater (i.e. speeds lower) than predicted.

Conversely, where the comparison returns a negative traffic flow difference or actual travel times are less (i.e. speeds higher) than predicted, the economic benefits of the project may have been under predicted.

Commentary on the impact of the project on local economic development has been provided where anecdotal feedback is available.

Data Sources

Stakeholder Feedback	Obtained from Highlands and Islands Enterprise.
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2.6 Integration

Commentary on Transport Integration and Policy Integration has been provided for projects that have specific objectives relating to the Integration criterion. In addition, anecdotal evidence from stakeholders has also been gathered, where available.

Data Sources

Ferry Patronage	Annual Carrying Statistics, CalMac Ferries Ltd.
Ferry Usage	Scottish Ferry Services: Draft Plan for Consultation (2011).
Stakeholder Feedback	Obtained from Shiel Buses and Highlands and Islands Enterprise.
Local Government Policies	Outlined within Structure and Local Plans.

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2.7 Accessibility & Social Inclusion

Commentary on Community Accessibility has been provided for projects that have specific objectives relating to the Accessibility & Social Inclusion criterion, supported by anecdotal evidence where available.

Data Sources

Provision for Non-motorised Users	Confirmed through site visits.
Cycling Provisions	Detailed within the Cycle Audit report produced during the project's preparation.
Stakeholder Feedback	Obtained from Shiel Buses and Highlands and Islands Enterprise.

2.8 Costs to Government

Investment Costs

Comparison Between Predicted and Out-turn Costs

A comparison between predicted and out-turn costs has been undertaken for all projects to confirm the accuracy of predictions during the pre-tender stage and support the evaluation of value for money.

The project cost predicted during the pre-tender stage has been used in the evaluation as it is at this stage that the decision is taken on whether or not to proceed with the project. All project costs include 25% optimism bias, unless stated otherwise within the evaluation.

One of the features of the progressive analysis of projects is that the economic assessment is undertaken at each stage based on the return on future investment. This means that project costs incurred prior to the pre-tender economic assessment, which are already spent and cannot be recovered (whether or not the project goes ahead) are excluded from the overall project costs input to the economic assessment. As such, only out-turn costs incurred after the pre-tender economic assessment have been included in the comparison.

Adjustments for Retail Price Indices and discount rates to both the predicted and out-turn costs have been made, taking expenditure by year into account, to convert the figures to a common 'present value year' for prices and values – either 1998 or 2002 depending on the 'present value year' used in the pre-tender economic assessment.

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Data Sources

Predicted Project Costs	Obtained from the pre-tender economic assessment undertaken during the project's preparation.
Out-turn Costs	Obtained from out-turn cost records.

2.9 Value for Money

Initial Indications

Based on the evaluation of economic benefits and project costs outlined in sections 2.5 and 2.8 respectively, a judgement in terms of the potential impact on the projects' value for money has been made.

The value for money of a project is considered to be greater than predicted where the economic benefits have been under predicted and the project costs over predicted. Conversely, the value for money of a project is considered to be lower than predicted where the economic benefits have been over predicted and the project costs under predicted.

Where both the economic benefits and project cost have been under predicted or over predicted, a judgement has been made with regards to the likely overall impact on value for money.

Data Sources

Predicted NPV and BCR	Obtained from the pre-tender economic assessment undertaken during the project's preparation.
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2.10 Achievement of Objectives

Initial Indications

The evaluation includes an indication of how the projects that opened between April 09 and March 10 are progressing towards achieving their objectives. Where specific indicators to measure the project's performance against its objectives have not been developed, an indication of how the project is progressing towards achieving its objectives is based on the pre opening data available, supplemented by post opening data collected as part of the evaluation.

Data Sources

Objectives	Confirmed from reported Environmental Statements or Route Action Plan, where applicable.
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EVALUATION SUMMARY



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3 EVALUATION SUMMARY

The projects that opened between April 09 and March 10 consist of three carriageway improvements and a junction improvement. A summary of the evaluations is provided below.

Full details of the evaluations for the projects are provided in Appendix A.

3.1 Network Traffic

Traffic Volumes

Comparison Between Pre and Post Opening Traffic Flows

The Annual Average Daily Traffic (AADT) flows pre and post project opening on the main route of the carriageway and junction improvement projects are shown in Table 3.1.

Table 3.1: All Projects – ATC Data

Project	AADT by Year				
	2007	2008	2009	2010	2011
A830(T) Arisaig to Loch Nan Uamh	1,002	1,032	Year of Opening	1,024	1,006
A7(T) Auchenrivock	3,570	3,586	Year of Opening	3,431*	3,434*
A9(T) Bankfoot					
North of Luncarty	16,497	16,110	Year of Opening	15,907	16,194
At Dunkeld	13,450	13,567		12,919	13,772

* flows based on partial data

The comparison between pre and post opening traffic flows indicates that traffic volumes have remained fairly consistent on the A830(T) between Arisaig and Loch Nan Uamh between 2007 to 2011 and that the remaining two projects have experienced a decrease in traffic flows over the same period. Whilst traffic volumes have remained consistent on the A830(T) and A7(T) projects between 2010 and 2011, the A9(T) project experienced a reduction in flows during 2010 but then an increase to pre-scheme levels in 2011.

Given the nature of these projects, changes in post opening traffic levels are not likely to be as a consequence of the improvements and, in part, are likely to be as a result of reductions in traffic volumes across the wider trunk road network in recent years (the reduction between 2009 and 2010 was around 2%) due to the economic downturn.

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Comparison Between Predicted and Actual Traffic Flows

A summary of the actual and predicted traffic data on the main route of the carriageway and junction improvement projects is shown in Table 3.2.

Table 3.2: All Projects – Traffic Analysis Summary

Project	Actual AADT*	Model Growth Scenario	Predicted AADT	(Predicted – Actual) / Actual
A830(T) Arisaig to Loch Nan Uamh	1,024	High	1,058	3.4%
A7(T) Auchenrivock	3,431 [^]	60/40	3,740	9.0%
A9(T) Bankfoot				
North of Luncarty	15,907	Central	13,504	-15.1%
At Dunkeld	12,919		9,710	-24.8%

* based on first full year of ATC data available after project opening

[^] flow based on partial data (August to December)

The comparison between predicted and actual AADT flows for the carriageway and junction improvement projects indicates that three of the four predictions are within the National Audit Office's threshold of +/-20%, which suggests that the modelling techniques used for appraising these types of projects are generally appropriate.

The exception to this is one of the comparisons undertaken for the A9(T) Bankfoot project, where it can be seen that the predicted flow at Dunkeld is around 25% lower than the actual flow (based on the flow observed in 2010, which itself was low).

Carriageway Standard Assessment

An assessment of the carriageway standard according to TA 46/97 – Economic Assessment and Recommended Flow Ranges for New Rural Road Links, which applied at the time of the projects' design, is shown in Table 3.3 based on the opening (or nearest to opening) year flow.

Table 3.3: All Projects – Assessment of Carriageway Standard (TA 46/97)

Project	Actual AADT*	TA 46/97 Standard	Constructed Standard
A830(T) Arisaig to Loch Nan Uamh	1,024	Single 2-Lane	Single 2-Lane
A7(T) Auchenrivock	3,431 [^]	Single 2-Lane	Single 2-Lane & Wide Single 2-Lane
A9(T) Bankfoot	Not appropriate		

* based on first full year of ATC data available after project opening

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[^] flows based on available data (August to December)

In order to satisfy the project's objectives, a higher standard of carriageway has been constructed over a section of the A7(T) at Auchenrivock to provide increased overtaking opportunities and help reduce platooning, reduce journey times and improve journey time reliability.

Overtaking Opportunities

One project in this report has objectives relating to Overtaking – the A7(T) Auchenrivock project.

Post Opening Overtaking Opportunities

The impact of the A7(T) Auchenrivock project has been based on the evaluation of other projects with a comparable standard of carriageway in the same geographic region for which overtaking surveys have been carried out. The provision of the wide single 2-lane carriageway is judged to have a positive impact on the number of overtaking manoeuvres.

Travel Times

Comparison Between Pre and Post Opening Travel Times

Pre and post opening travel time information was available for the A830(T) Arisaig to Loch Nan Uamh project. A comparison of the pre and post opening travel times indicates time savings of around 4 to 5 minutes for vehicles using the improved section of the route.

Change in Travel Times

Journey times on the A7(T) at Auchenrivock are expected to have reduced as a consequence of the improvements to road geometry and the provision of a wide single 2-lane carriageway, providing increased overtaking opportunities.

Whilst journey times for some local trips accessing the A9(T) may have marginally increased as a result of the revised junction layout at Bankfoot, it can be expected that journey times on the A9(T) carriageway itself over the extents of the improvement will have reduced in both directions of travel as a result of removing delays to mainline traffic caused by right turning vehicles.

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Comparison Between Predicted and Actual Travel Times

A comparison between predicted and actual travel times has been undertaken for the A830(T) Arisaig to Loch Nan Uamh project and indicates that the predicted journey times on the A830(T) between Arisaig and Loch Nan Uamh are around 1 minute longer than the observed journey times in both directions of travel.

Stakeholder feedback

Dumfries and Galloway Council has commented that overtaking opportunities have increased significantly as a result of the project. The Council also suggests that travel times are likely to have been reduced as a result of the scheme.

3.2 Environment

Review of Environmental Mitigation Measures

The environmental mitigation measures contained in the environmental reports, produced at the time the projects were originally assessed, have been examined and compared against the actual measures put in place.

The review of mitigation measures confirmed that the majority of measures committed within the Environmental Statements were in place and were providing appropriate levels of mitigation.

Whilst some variations from the proposed mitigation measures had been identified, these were not considered to have had a material detrimental impact on the general integration of the project into its surrounding.

Areas that require maintenance were identified as part of the environmental mitigation measures review undertaken for A9(T) Bankfoot project.

Noise and Air Quality

Given the rural nature of the carriageway projects and the nature of the A9(T) Bankfoot improvement, no evaluation of the projects' impact on noise and air quality has been undertaken as no significant impacts were anticipated.

3.3 Safety

Accidents

Comparison between Pre and Post Opening Personal Injury Accident Numbers

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A summary of the personal injury accident data for all projects is shown in Table 3.4.

Table 3.4: All Projects – Personal Injury Accident Data Summary

Project	3 Years Before				1 Year After			
	Fatal	Serious	Slight	Total	Fatal	Serious	Slight	Total
A830 (T) Arisaig to Loch Nan Uamh	0	0	4	4	0	0	0	0
A7(T) Auchenrivock	1	0	0	1	0	0	0	0
A9(T) Bankfoot	0	0	6	6	0	0	0	0

For all projects examined in this report, no personal injury accidents have been recorded in the 1 year after opening compared to the numbers recorded during the 3 years before opening.

Road Safety Audits

Stage 4 Road Safety Audit (RSA) reports are available for all the projects that opened between April 09 and March 10.

Whilst some issues concerning pedestrians and cyclists on the A830(T) between Arisaig and Loch Nan Uamh are still to be resolved, an issue surrounding the speed of vehicles on the new section of A7(T) at Auchenrivock has been noted and there is a skid risk from vehicles overrunning filter drain material and scattering it on the A9(T) carriageway at Bankfoot, the RSA findings generally indicate that the projects are operating safely. The findings are summarised within the evaluations presented in Appendix A.

3.4 Economy

Transport Economic Efficiency

The comparison between predicted and actual traffic flows and travel times, presented in section 3.1, can be considered a proxy for whether the predicted economic benefits of the projects are likely to be realised.

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Table 3.5: All Projects – Qualitative Evaluation of Benefits

Project	Benefits (Relative to Predicted)
A830(T) Arisaig to Loch Nan Uamh	↑
A7(T) Auchenrivock	↓
A9(T) Bankfoot	↑

↓ actual lower than predicted (over predicted)

↑ actual higher than predicted (under predicted)

= actual as predicted

Due to external factors that could not have readily been foreseen at the time of the assessments, such as the economic downturn, there is a tendency for predicted flows to be overestimated. Whilst this may have resulted in the over-prediction of economic benefits for the A7(T) Auchenrivock project, the comparison between predicted and actual traffic flows is within acceptable limits.

3.5 Integration

One project in this report has objectives that relate to Integration – the A830(T) Arisaig to Loch Nan Uamh (Transport and Policy Integration).

The A830(T) Arisaig to Loch Nan Uamh project accords with the policies contained within the Highland Structure Plan and the Lochaber Local Plan in respect of their objective of promoting the economic development of the area by improving transport links.

Stakeholder feedback

Anecdotal evidence indicates that the interchange experience has been enhanced for bus passengers as a result of more reliable connections and that the A830(T) Arisaig to Loch Nan Uamh project may have played a role in encouraging the use of the Mallaig to Armadale ferry route.

Whilst Calmac ferry passenger figures do report an increase in 2009 compared to 2008, it cannot be confirmed if this increase is directly attributable to the road improvement.

3.6 Accessibility & Social Inclusion

Two projects in this report have objectives that relate to Accessibility & Social Inclusion – the A830(T) Arisaig to Loch Nan Uamh and the A7(T) Auchenrivock.

SCOTTISH TRUNK ROAD INFRASTRUCTURE PROJECT EVALUATION

TRANSPORT **SCOTLAND**

A new cycle / pedestrian track has been implemented as part of the A830(T) project and has been observed to be in regular use. Some outstanding issues for active travel users are still to be resolved, as identified during the RSA.

A Cycle Audit was carried out as part of the RSA for the A7(T) Auchenvick project and recommendations have been provided to address potential issues with the measures provided for cyclists.

Stakeholder feedback

Anecdotal evidence indicates that the reduction in journey times and improvement in journey time reliability on the A830(T) between Arisaig and Loch Nan Uamh has had a positive impact on community access and has improved supply chains and linkages between the areas of Mallaig and Arisaig to Fort William.

3.7 Cost to Government

Investment Costs

Comparison Between Predicted and Out-turn Costs

The out-turn and predicted costs for the three projects are shown in Table 3.6.

The costs are presented in either mid 1998 prices discounted to 1998 at 3.5% or mid 2002 prices discounted to 2002 at 3.5%, depending on the 'present value year' used in the pre-tender economic assessment.

Table 3.6: All Projects – Project Cost Summary

Project	Project Cost		Difference (Out-turn – Pred)
	Out-turn	Predicted	
Mid 1998 prices discounted to 1998 at 3.5%			
A7(T) Auchenvick	£5,580,931	£4,600,750	£980,181 (21%)
Mid 2002 prices discounted to 2002 at 3.5%			
A830(T) Arisaig to Loch Nan Uamh	£15,570,890	£16,298,580	-£727,691 (-4%)
A9(T) Bankfoot	£2,067,298	£1,295,744	£771,554 (60%)

Of the three comparisons between predicted and actual costs presented in this report, two have an actual project cost higher than the predicted cost. The under prediction can be explained, at least in part, by agreed variations to the project design and claims during the projects' construction.

SCOTTISH TRUNK ROAD INFRASTRUCTURE PROJECT EVALUATION

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3.8 Value for Money

A summary of the value for money for the three projects where an economic assessment was undertaken is shown in Table 3.7 based on the qualitative evaluation of economic benefits and quantitative evaluation of project costs presented in sections 3.4 and 3.7 respectively.

Table 3.7: All Projects – Value for Money Summary

Project	Predicted		Actual (Relative to Predicted)		
	NPV (£m)	BCR	Benefits	Project Costs	Value for Money
A830(T) Arisaig to Loch Nan Uamh	-4.55	0.77	↑	↓	↑
A7(T) Auchenrivock	1.19	1.19	↓	↑	↓
A9(T) Bankfoot	0.97	1.97	↑	↑	↓

↓ actual lower than predicted (over predicted)

↑ actual higher than predicted (under predicted)

= actual as predicted

Based on the evaluation of economic benefits and project costs, it is likely that the A830(T) Arisaig to Loch Nan Uamh project will deliver value for money over and above that predicted at the time of assessment. Whilst the remaining two evaluations indicate that the value for money is unlikely to be as great as predicted, it is judged that the A7(T) Auchenrivock and A9(T) Bankfoot projects will continue to provide a benefit to road users.

3.9 Achievement of Objectives

Initial Indications

Table 3.8 provides an indication of how the projects that opened between April 09 and March 10 are progressing towards achieving their objectives.

Table 3.8: All Projects – Progress Towards Achieving Objectives

Project	Progress
A830(T) Arisaig to Loch Nan Uamh	<ul style="list-style-type: none"> • Eleven objectives were set, which cover the project's operational performance and the following criteria: Environment, Safety, Economy, Integration, Accessibility & Social Inclusion and Value for Money. • Progress towards ten of the objectives has been positive. • The objective relating to accessibility & social inclusion cannot be confirmed as information on access to Arisaig, Morar, Malliaig, the small Isles, South Uist and Skye for non motorised is not available.

SCOTTISH TRUNK ROAD INFRASTRUCTURE PROJECT EVALUATION

TRANSPORT **SCOTLAND**

Project	Progress
A7(T) Auchenrivock	<ul style="list-style-type: none"> • Five objectives were set, which cover the project's operational performance and the following criteria: Environment, Economy, Accessibility & Social Inclusion and Value for Money. • Progress towards four of the objectives has been positive. • Initial indication is that the objective relating to value for money may not be achieved.
A9(T) Bankfoot	<ul style="list-style-type: none"> • Four objectives were set, which cover the project's operational performance and the following criteria: Environment, Safety and Value for Money. • Progress towards three of the objectives has been positive. • Initial indication is that the objective relating to value for money may not be achieved.

Overall, it can be concluded that the projects that opened between April 09 and March 10 are generally progressing towards achieving their objectives.

SCOTTISH TRUNK ROAD INFRASTRUCTURE **PROJECT EVALUATION**

TRANSPORT **SCOTLAND**

4 KEY FINDINGS

4.1 Introduction

This chapter provides a summary of the key findings from the evaluations undertaken for the three trunk road infrastructure projects that opened between April 09 and March 10, highlighting any trends and stand-out issues.

4.2 Network Traffic

- The evaluations undertaken indicate that the projects are generally operating as expected.
- Whilst an increase in traffic flows was experienced on the A9(T) at Bankfoot, traffic flows have generally been stabilising and/or declining over recent years due to the economic downturn.
- Whilst there appears to be a general bias towards the over prediction of traffic flows for carriageway improvement projects that opened between April 09 and March 10 (due to the economic downturn), predicted flows are (with one exception) within accepted limits, which suggests that the forecasting techniques used for appraising these types of projects are generally appropriate. The reason for the significant under prediction of traffic flows on the A9(T) at Bankfoot should be explored further.
- The standards of carriageway constructed are generally appropriate for the post opening traffic flows on the projects. A higher standard of carriageway has been constructed on the A7(T) at Auchencroft in order to satisfy the project's objectives.

4.3 Environment

- A review of the proposed mitigation measures contained in the environmental reports for each of the projects opened between April 09 and March 10 confirmed that the majority of measures committed within the Environmental Statement were in place and were providing appropriate levels of mitigation.
- Whilst some mitigation measures were not evident on site, these may be due to variations and/or separate arrangements with the relevant landowners. Transport Scotland is looking at ways to improve the environmental review process to provide a better record of the mitigation measures that have been implemented, including details of any agreed variations.
- Areas that require maintenance were identified as part of the environmental mitigation measures review undertaken for A9(T) Bankfoot project.

SCOTTISH TRUNK ROAD INFRASTRUCTURE

PROJECT EVALUATION

TRANSPORT **SCOTLAND**

4.4 Safety

- Initial indications from the available personal injury accident data are that the projects opened between April 09 and March 10 are contributing towards an overall improvement in road safety.
- Stage 4 RSA reports for projects that opened between April 09 and March 10 have been available and provide evidence supporting this apparent improvement in road safety.
- The RSA report for the A830(T) Arisaig to Loch Nan Uamh project notes that some issues concerning pedestrians and cyclists are still to be resolved.
- The RSA report for the A9(T) Bankfoot project notes a skid risk from vehicles overrunning filter drain material and scattering it on the carriageway surface.

4.5 Economy

- Whilst two of the three projects that opened between April 09 and March 10 saw an under-prediction of benefits, no emerging trend has been identified.
- The over-prediction of economic benefits, as a result of over-estimating traffic flows, supports the need for sensitivity testing to understand the range of possible economic outcomes.

4.6 Integration

- One project, the A830(T) Arisaig to Loch Nan Uamh, was evaluated against the Integration criteria and the project provides transport integration benefits and supports Local and Central Government policy.

4.7 Accessibility & Social Inclusion

- A review of the proposed measures for cyclists and pedestrians indicates that the measures are generally being delivered.
- Some outstanding issues for active travel users of the A830(T) Arisaig to Loch Nan Uamh and A7(T) Auchenvick projects are still to be addressed.
- Anecdotal evidence indicates that the A830(T) Arisaig to Loch Nan Uamh project has improved the reliability of local public transport services connecting with local ferry services.

SCOTTISH TRUNK ROAD INFRASTRUCTURE

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4.8 Cost to Government

- There appears to be a slight bias towards the under-prediction of project costs for projects that opened between April 09 and March 10, with the predicted cost less than the out-turn cost for two of the three projects.

4.9 Value for Money

- Based on the evaluation of economic benefits and project costs, the value for money associated with two projects that opened between April 09 and March 10 are unlikely to be as great as predicted, although it is judged that they will continue to provide a benefit to road users.

4.10 Achievement of Objectives

- The majority of objectives for projects that opened between April 09 and March 10 have not been expressed with SMART (Specific, Measurable, Attainable, Relevant and Timed) principles in mind having been set prior to the publication of the Scottish Transport Appraisal Guidance (STAG).
- Two objectives may not be achieved and these relate to Value for Money. It is not always possible to confirm whether projects are likely to deliver value for money at an early stage after opening for a number of reasons, which may include uncertainty regarding future traffic flow trends, the magnitude of benefits attributable to after opening traffic conditions, etc.
- Overall, the projects that opened between April 09 and March 10 are generally progressing towards achieving their objectives.

Appendix A: Evaluations for Projects That Opened Between April 09 and March 10

**A APPENDIX A: EVALUATIONS FOR PROJECTS THAT OPENED BETWEEN
APRIL 09 AND MARCH 10**

A.1 A830(T) ARISAIG TO LOCH NAN UAMH

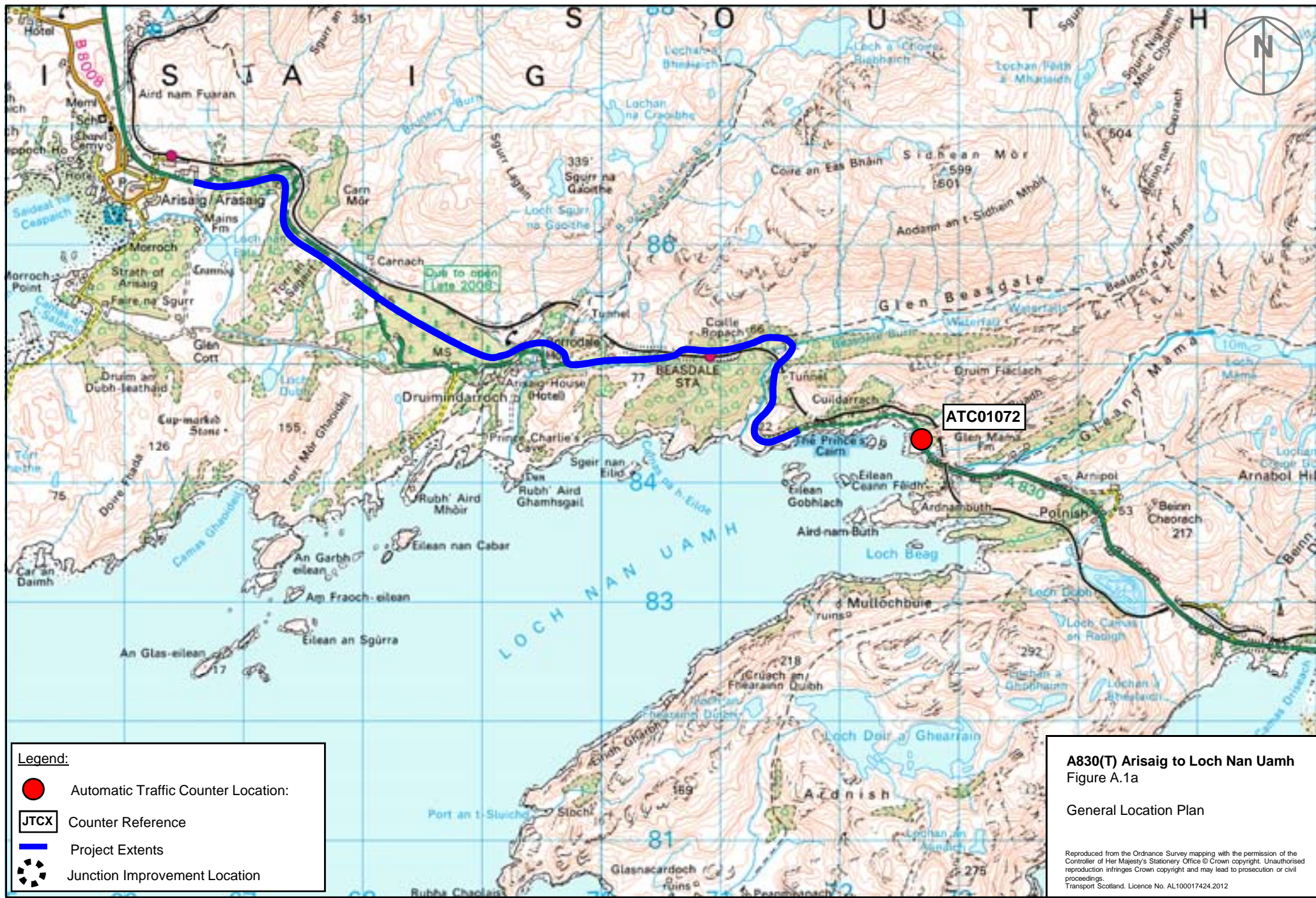
A.1.1 Introduction

Project Overview

The project involved the upgrade of 7.5 kilometres of single track road with passing places on the A830(T) between Arisaig and Loch Nan Uamh to single carriageway, to allow for the two way flow of traffic on this link to Mallaig and its ferry connections to the Small Isles.

The general location of the project is shown in Figure A.1a.

The A830(T) Arisaig to Loch Nan Uamh project was officially opened to traffic on 15th April 2009.



Legend:

- Automatic Traffic Counter Location:
- JTCX Counter Reference
- Project Extents
- Junction Improvement Location

A830(T) Arisaig to Loch Nan Uamh
 Figure A.1a

General Location Plan

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Project Objectives

The objectives of the A830(T) Arisaig to Loch Nan Uamh project were set as follows:

- to minimise the impact of the route upgrading on the sensitive environment of the area, in particular, the designated sites, Glen Beasdale candidate Special Area of Conservation, Morar, Moidart and Ardnamurchan National Scenic Area, Proposed Area of Great Landscape Value, the Designed Landscapes of Larachmore Gardens and Arisaig House, other cultural heritage interests, the rural community and existing land use;
- to improve road safety, reducing the number of damage, slight only and serious accidents, on this section of the A830;
- to provide a value for money solution to improve journey times and level of service for local, business, commercial and tourist users of the A830, maintaining the lifeline link to Arisaig, Morar, Mallaig and to the ferry links to the Small Isles: Rum, Muck, Eigg, Canna and to South Uist and Skye;
- to aid sustainable economic development, encourage inward investment and creation of business opportunities in the Ardnamurchan and Moidart areas;
- to maintain a link to the Beasdale Railway Halt and Highland Line;
- to fit with land-use policy as identified in Highland Council Structure Plan and Lochaber Local Plan;
- to ensure rural and island communities remain sustainable and strengthen in the longer term, providing improvement in links to employment and for tourism;
- to provide better local community access, aid more efficient delivery of services and improve communications locally;
- to enable the area at a regional level to realise its economic development potential in terms of external markets, in particular, tourism, timber and fishing;
- to improve access to Arisaig, Morar, Mallaig, the Small Isles, South Uist and Skye for non motorised users of the trunk road corridor, in particular touring cyclists and walkers; and
- to ensure a good fit with existing access to established Rights of Way and minor roads and tracks used by walkers in the area between Glen Beasdale and Arisaig.

Evaluation Methodology

The A830(T) Arisaig to Loch Nan Uamh project has been evaluated against the above objectives and the following criteria:

- Environment;
- Safety;
- Economy;
- Integration;
- Accessibility & Social Inclusion;
- Costs to Government; and
- Value for Money.

The evaluation is supported by the consideration of network traffic indicators, including traffic volumes and travel times presented in the following section.

A.1.2 Network Traffic

Traffic Volumes

The location of the Automatic Traffic Counter (ATC) within the study area is shown in Figure A.1a.

Comparison Between Pre and Post Opening Traffic Flows

The Annual Average Daily Traffic (AADT) flows pre and post project opening on the A830(T) route within the vicinity of the project are presented in Table A.1.1.

Table A.1.1: A830(T) Arisaig to Loch Nan Uamh – ATC Data

ATC Reference	AADT by Year					
	2006	2007	2008	2009	2010	2011
A830(T) West of Polish						
ATC01072	931	1,002	1,032	Year of Opening	1,024	1,006

A comparison between pre and post opening traffic volumes on the A830(T) mainline to the west of Polish indicates that traffic flows in 2010 were broadly comparable with 2008 flow levels and flows in 2011 were marginally lower.

Given the nature of the A830(T) Arisaig to Loch Nan Uamh project, reductions in traffic are not likely to be as a consequence of changes to the carriageway standard and may be as a result of general reductions in traffic volumes across the wider trunk road network due to the economic downturn experienced during the evaluation period.

Comparison Between Predicted and Actual Traffic Flows

The opening year flow comparisons for the A830(T) Arisaig to Loch Nan Uamh project are based on AADT flows from 2010 as this was the first full year of reliable traffic data available from Transport Scotland’s traffic counter within the vicinity of the project.

As part of the project’s appraisal, National Road Traffic Forecasts (NRTF) high traffic growth factors were applied to the 2005 base year traffic flows to derive opening and future modelled assessment year traffic flows. Predicted traffic flows for 2010 have been derived by factoring the 2005 base year flows used in the economic assessment with NRTF high traffic growth factors.

A summary of the actual and predicted traffic data is shown in Table A.1.2 below.

Table A.1.2: A830(T) Arisaig to Loch Nan Uamh – Traffic Analysis Summary

ATC Ref	Actual AADT*	Predicted AADT	% Difference (Predicted – Actual) / Actual
		High	High
A830(T) West of Polish			
ATC01072	1,024	1,058	3.4%

* 2010 flows (first full year of ATC data available)

The comparison between predicted and actual AADT flows in Table A.1.2 indicates that the predicted 2010 flow was 3.4% (around 30 vehicles) greater than the observed 2010 flow, which is well within accepted limits.

Carriageway Standard Assessment

A single carriageway was constructed on the A830(T), between Arisaig and Loch Nan Uamh, to allow for the two way flow of traffic on this link to Mallaig and its ferry connections to the Small Isles to help improve journey times and level of service as well as aid sustainable economic development.

An assessment of the carriageway standard according to TA 46/97– Economic Assessment and Recommended Flow Ranges for New Rural Road Links, which applied at the time of the project design, is shown in Table A.1.3 based on the observed 2010 traffic flow.

Table A.1.3: A830(T) Arisaig to Loch Nan Uamh – Assessment of Carriageway Standard (TA 46/97)

Opening Year AADT*	TA 46/97 Standard	Constructed Standard
1,024	Single 2-Lane	Single 2-Lane

* 2010 flows (first full year of ATC data available)

The carriageway assessment indicates that the observed 2010 flow lies within the flow range appropriate for a single 2-lane standard of carriageway, which is the minimum standard.

Travel Times

Comparison Between Pre and Post Opening Travel Times

Journey time surveys were carried out for the A830(T) Arisaig to Loch Nan Uamh project in September 2002 and April 2012, to provide an indication of the changes in average journey times along the A830(T) between Arisaig and Loch Nan Uamh.

The average pre and post journey times along with the post opening savings in travel time are shown in Table A.1.4 below.

Table A.1.4: A830(T) Arisaig to Loch Nan Uamh – Travel Time Data

Direction	Average Journey Time		Time Savings (mins / secs)	% Saving
	Pre Opening (2002)	Post Opening (2012)		
Eastbound	10m 33s	5m 58s	4m 35s	43%
Westbound	11m 07s	5m 51s	5m 16s	47%

Stakeholder Feedback

Anecdotal evidence indicates that the reliability of journey times has improved as a result of the project.

Shiel Buses, a local bus operator, was approached to determine the impact of the project on local bus operations. The company, which runs several services along the A830(T) route, indicated that, as a result of the project, a more reliable timetable and service could be provided and arrival times to connect with the Acharacle to Fort William connection could now be accurately predicted.

Comparison Between Predicted and Actual Travel Times

The available predicted 2010 journey times have been compared with the post opening journey times collected in April 2012. The comparison between the available predicted and actual journey times indicates that the predicted journey times on the A830(T) between Arisaig and Loch Nan Uamh are around 1 minute longer than the observed journey times in both directions of travel.

A.1.3 Environment

Review of Environmental Mitigation Measures

The environmental mitigation measures originally proposed for the A830(T) Arisaig to Loch Nan Uamh project were obtained from the project's Environmental Statement. A review of the environmental mitigation measures was carried out in July 2011, which confirmed that the majority of measures committed within the Environmental Statement were in place and were providing appropriate levels of mitigation. The key mitigation measures implemented as part of the project are as follows:

- provision of culverts and water course realignment to protect existing riverbeds;
- encouragement of the regeneration of natural oakwood habitat;
- specific measures for the protection of mammals including badgers and otters;
- construction of pedestrian and estate access and stone walling on the edge of Arisaig Village;
- construction of deer fencing to minimise collisions between larger mammals and vehicles;
- new structures constructed with a similar design to existing structures to maintain landscape character;
- provision of deciduous woodland planting, native grasses and herbs to grub up sections of the redundant road;
- provision of deciduous woodland planting on embankment slopes to reduce visual impacts from Arisaig House, Borrodale House and Farm Steading;

- provision of a dedicated cycle / pedestrian track linking to Arisaig village; and
- provision of a road with sufficient capacity to ensure the free flow of traffic along the route to avoid driver frustration.

Noise and Air Quality

Given the rural nature of the A830(T) Arisaig to Loch Nan Uamh project, no significant impact on noise and air quality is expected. It is therefore not appropriate to evaluate the project's impact on noise and air quality.

Environment: Key Findings

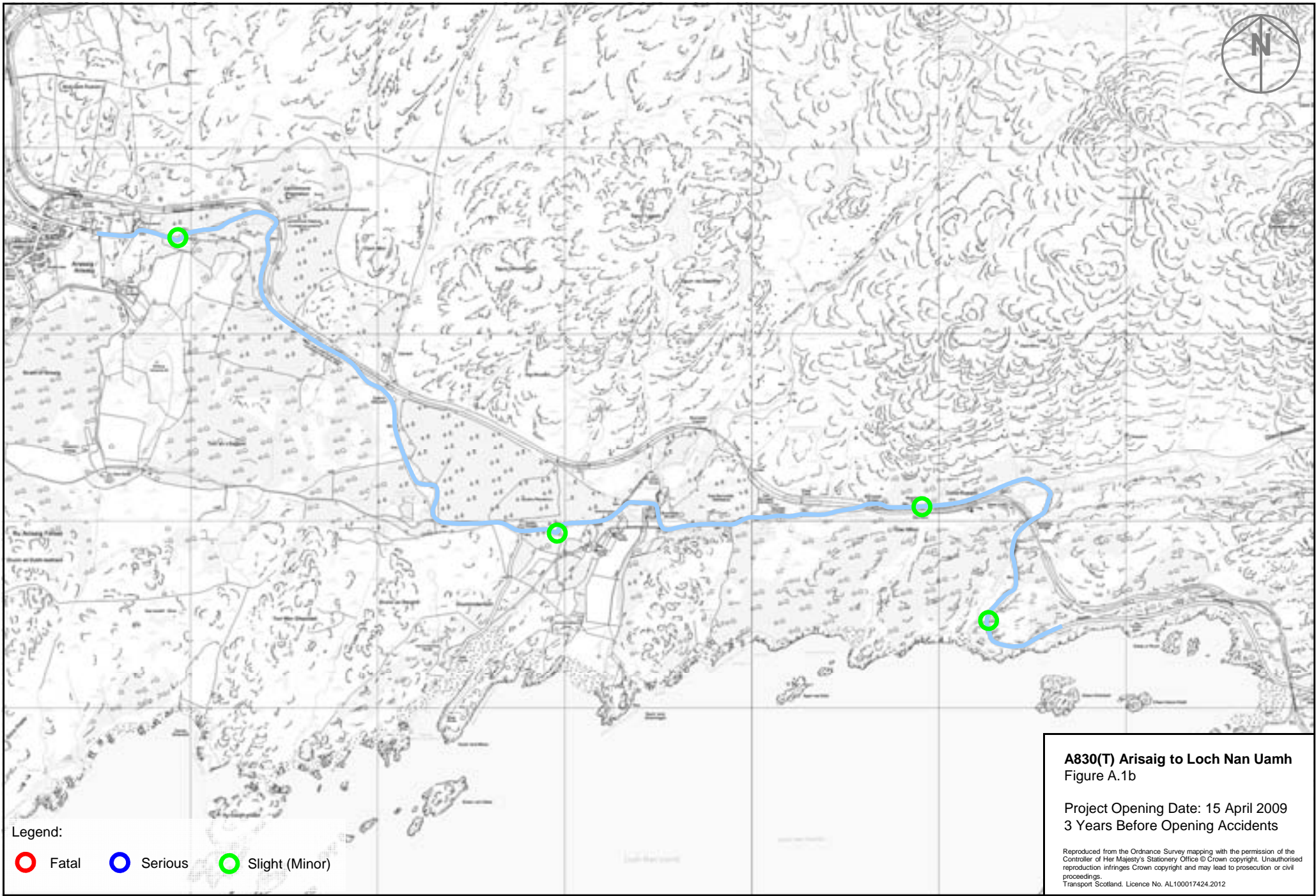
The review of mitigation measures implemented for the A830(T) Arisaig to Loch Nan Uamh project confirmed that the majority of measures committed within the Environmental Statement were in place. Whilst some variations from the proposed mitigation measures had been identified, these were not considered to have had a material detrimental impact on the general integration of the project into its surrounding.

A.1.4 Safety

Accidents

Comparison Between Pre and Post Opening Personal Injury Accident Numbers

The locations and severities of accidents occurring within the vicinity of the A830(T) Arisaig to Loch Nan Uamh project 3 years before and 1 year after project completion are shown in Figures A.1b and A.1c.

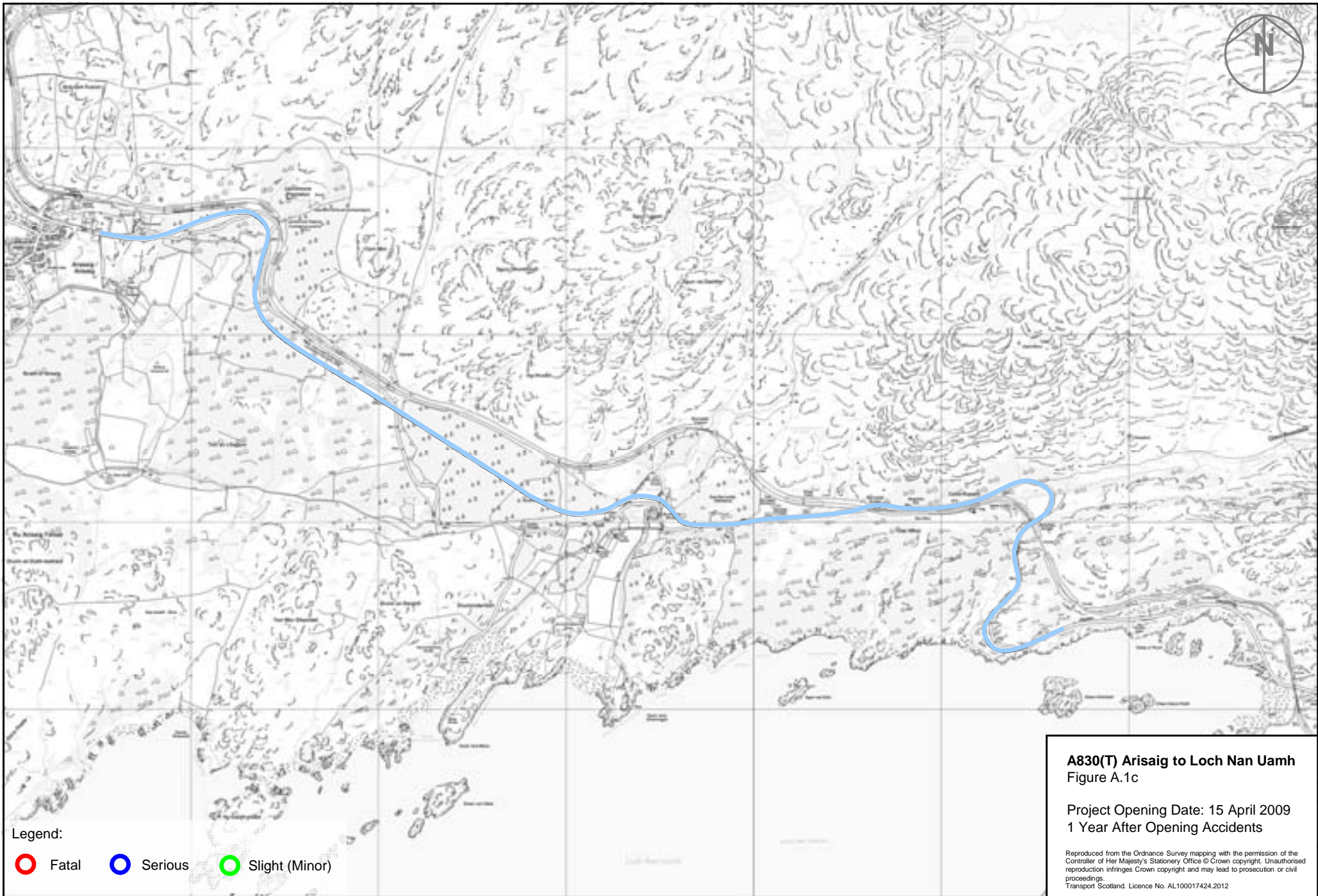


Legend:
● Fatal ● Serious ● Slight (Minor)

A830(T) Arisaig to Loch Nan Uamh
Figure A.1b

Project Opening Date: 15 April 2009
3 Years Before Opening Accidents

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A summary of the personal injury accident data is shown in Table A.1.5.

Table A.1.5: A830(T) Arisaig to Loch Nan Uamh – Accident Data Summary

Period	Fatal	Serious	Slight	Total Accidents
3 Years Before				
A830(T)	0	0	4	4
1 Year After				
A830(T)	0	0	0	0

As can be seen from Table A.1.5, no personal injury accidents occurred in the 1 year period following the opening of the project in comparison to four personal injury accidents (slight) in the 3 years before opening, suggesting a potential improvement in road safety.

Stakeholder Feedback

HITRANS (Highlands and Islands Transport Partnership) questioned whether the improved standard of carriageway may have created a perception for drivers that vulnerable users will be segregated and, as such, drivers may be less aware of active travel users on adjacent sections of the A830(T) route. The pedestrian / cycle track was observed as being in regular use during the environmental mitigation measures review and there is no evidence of a reduction in safety for active travel users on adjacent sections.

In addition, anecdotal feedback from The Highland Council suggests that there has been an improvement in safety for cyclists using the “old” road to access Arisaig, which has seen reduced traffic levels as a result of the project.

Road Safety Audits

The Stage 4 Road Safety Audit (RSA) was carried out in June 2010 and examines the accidents which occurred during the period January 2005 to May 2010. This period differs with the summary of pre and post opening accidents presented in Table A.1.5, which covers the 3 year period prior to the opening of the project from 15th April 2006 to 14th April 2009 and the 1 year period following opening of the project from 15th April 2009 to 14th April 2010.

The RSA notes that five slight injury and 14 non-injury accidents occurred between January 2005 and the opening of the project and confirmed that no accidents (injury or damage only) had occurred within the vicinity of the project in the 1 year period after project opening. One of the accidents that occurred prior to the opening of the project involved a collision between a car and a parked HGV and the RSA suggests that this accident may have been attributable to the construction traffic associated with the A830(T) improvements.

The Stage 4 RSA raised some issues that still require to be resolved. These focus on incorrect mounting of „Give Way’ signs; and the requirement for fencing to protect cyclists and pedestrians from leaving the cycleway on a steep, downhill section of the combined cycle/footway. Furthermore, the audit concluded that on the eastbound approach to Loch Nan Uamh, cyclists are more likely to remain on the carriageway than use the segregated section as certain features of this section are not attractive to users (the eastbound cycle facility may result in cyclists travelling downhill at speed).

Safety: Key Findings

An assessment of the 1 year post opening personal injury accidents and a review of the Stage 4 RSA report, suggests that the A830(T) Arisaig to Loch Nan Uamh project is operating safely, however, some unresolved issues have been raised pertaining to active travel users.

A.1.5 Economy

Transport Economic Efficiency

The comparisons between predicted and actual traffic flows and travel times, presented in section A.1.2, can be considered a proxy for whether the predicted economic benefits of the project are likely to be realised.

Comparison Between Predicted and Actual Traffic Flows

The comparison between predicted and actual traffic flows indicates that the predicted 2010 flow was within 3.4% (around 30 vehicles) of the observed 2010 flow on the A830(T).

Comparison Between Predicted and Actual Travel Times

The comparison of predicted and actual travel times indicates that the predicted journey times are around 1 minute longer than observed journey times.

Stakeholder Feedback

Highlands and Islands Enterprise, the local enterprise body for the region, has suggested that the project has had a positive impact on several aspects of local economic development including a marked improvement in: journey times and journey time reliability; the attraction of visitors to the area; the connectivity of Mallaig and Arisaig to Fort William; and a perceived improvement to access for local businesses.

Economy: Key Findings

The comparison of predicted and actual traffic flows and travel times confirms that the predicted economic benefits may have been underestimated.

Qualitative anecdotal evidence indicates that the project has provided local economic benefits – reducing time lost to commuters, businesses, transport operators and visitors through improved journey time reliability; improving the attractiveness of the area for investment; and improving economic ties between Mallaig and Fort William.

A.1.6 Integration

Transport Integration

Stakeholder Feedback

Shiel Buses, a local bus operator on the route, indicated that as a result of the project, it had been able to provide a more reliable timetable and service and is now able to predict arrival times to link with the Acharacle to Fort William connection.

Highlands and Islands Enterprise has suggested that the project has played a role in encouraging use of the Mallaig to Armadale ferry route. Whilst the total number of passengers using the Mallaig to Armadale ferry service has increased from 209,000 in 2009 to 221,000 in 2011 (Ref. Annual Carrying Statistics, CalMac Ferries Ltd), it cannot be confirmed that the A830(T) Arisaig to Loch Nan Uamh project has been the sole factor. Transport Scotland's Scottish Ferry Services: Draft Plan for Consultation (2011) states that the Mallaig to Armadale ferry route is predominantly used by leisure travellers as opposed to businesses or residents (who have transferred to the A87(T) route via the Skye Bridge) and this suggests that the increase in use has been from leisure travellers.

Policy Integration

The Environmental Statement for the project contains a detailed assessment against the planning policies in place at the time of the project's development and implementation. The assessment concluded that the proposed realignment of the A830(T) between Arisaig and Loch Nan Uamh accords with the policies contained within the Highland Council Structure Plan and the Lochaber Local Plan in respect of their objective of promoting the economic development of the area by improving transport links.

The Environmental Statement highlighted areas of potential conflict with development plan policies with regards to the impact of the project on aspects of the natural and built environment. No evidence has been found to challenge any of the conclusions.

Integration: Key Findings

Stakeholder feedback indicates that the interchange experience has been enhanced for bus passengers as a result of more reliable connections and that the project has played a role in encouraging the use of the Mallaig to Armadale ferry route.

The A830(T) Arisaig to Loch Nan Uamh project accords with the policies contained within the Highland Structure Plan and the Lochaber Local Plan in respect of their objective of promoting the economic development of the area by improving transport links.

A.1.7 Accessibility & Social Inclusion

Community Accessibility

Measures to mitigate impacts to cyclists and pedestrians were implemented during the project, with access to Rights of Way protected, and a dedicated cycle / pedestrian track provided along the length of the improvement. During the environmental mitigation measures review, the cycle / pedestrian track was observed as being in regular use, however, no evidence has been identified to confirm whether there has been a change in the levels of use of this route by active travel users.

It is likely that accessibility improvements will have been felt by local active travel users in and around Arisaig where the segregated track links with local cycling routes. It is difficult, however, to conclude whether any wider accessibility impacts have resulted from this active travel element of the project.

Stakeholder Feedback

The Shiel Buses service between Mallaig and Fort William operates along the A830(T) route enhanced by the improvement. Anecdotal evidence indicates that, as a result of the A830(T) Arisaig to Loch Nan Uamh project, journey time reliability has improved, allowing Shiel Buses to provide a more reliable timetable, which has in turn improved the interchange experience for passengers linking with the Acharacle to Fort William connection. No quantitative evidence has been identified to confirm whether the improvement in journey times has led to increased accessibility through the provision of additional services or revised service patterns.

Anecdotal evidence from Highlands and Islands Enterprise suggests that the project has had a positive impact on community access and has improved supply chains and linkages between the areas of Mallaig and Arisaig to Fort William.

Accessibility & Social Inclusion: Key Findings

A new cycle / pedestrian track has been implemented as part of the project and has been observed to be in regular use. It is, therefore, likely that local accessibility for pedestrians and cyclists has been enhanced as a result of the project.

Stakeholder feedback indicates that the reduction in journey times and improvement in journey time reliability has had a positive impact on community access and has improved supply chains and linkages between the areas of Mallaig and Arisaig to Fort William.

A.1.8 Cost to Government

Investment Costs

Comparison Between Predicted and Out-turn Costs

The out-turn and predicted project costs are shown in Table A.1.6. As schemes progress towards procurement, there is normally greater confidence in their cost predictions and optimism bias can be reduced. Due to the timing of the pre-tender assessment for the A830(T) Arisaig to Loch Nan Uamh project, optimism bias was not considered to be required.

Table A.1.6: A830(T) Arisaig to Loch Nan Uamh – Project Cost Summary

	Out-turn Cost		Predicted Cost		Difference (Out-turn - Est)
	@ May 11	Mid 02 Prices in 2002 at 3.5% Discount	Sep 06 Prices	Mid 02 Prices in 2002 at 3.5% Discount	Mid 02 Prices in 2002 at 3.5% Discount
Total	£22,587,342	£15,570,890	£22,502,000	£16,298,580	-£727,691 (-4%)

Cost to Government: Key Findings

The out-turn cost of the A830(T) Arisaig to Loch Nan Uamh project was approximately £0.7m (4%) lower than was predicted at the time of the assessment.

A.1.9 Value for Money

Initial Indications

The pre-tender economic appraisal results for the A830(T) Arisaig to Loch Nan Uamh project predicted a Net Present Value (NPV) of -£4.55m and Benefit to Cost Ratio (BCR) of 0.77 under the high traffic growth forecast scenario.

The appraisal was updated at the post-tender stage and with European funding available, the scheme was considered to deliver value for money.

Based on the comparisons presented in sections A.1.5 and A.1.8, which suggest that the benefits may have been underestimated and indicate that the out-turn cost is less than predicted, the NPV and BCR of the project is likely to be greater than predicted at the pre- and post-tender stages.

Value for Money: Key Findings

It is judged that the project is likely to deliver value for money over and above that predicted as part of the project's assessment.

A.1.10 Achievement of Objectives

As specific indicators to measure the performance of the A830(T) Arisaig to Loch Nan Uamh project against its objectives have not been developed, an initial indication of how the project is progressing towards achieving its objectives is based on the pre opening data available, supplemented by post opening data collected as part of the evaluation.

Initial Indications

A summary of the evaluation, providing an indication of how the A830(T) Arisaig to Loch Nan Uamh project is progressing towards achieving its objectives, is presented in Table A.1.7.

Scottish Trunk Road Infrastructure Project Evaluation - Appendix A
A830(T) Arisaig to Loch Nan Uamh

Table A.1.7: A830(T) Arisaig to Loch Nan Uamh – Progress Towards Achieving Objectives

Objective	Commentary	Progress
<p>Minimise the impact of the route upgrading on the sensitive environment of the area, in particular, the designated sites, Glen Beasdale candidate Special Area of Conservation, Morar Moidart and Ardnamurchan National Scenic Area, Proposed Area of Great Landscape Value, the Designed Landscapes of Larachmore Gardens and Arisaig House, other cultural heritage interests, the rural community and existing land use.</p>	<p>The project is characterised by the effective grading of side slopes and rock walls to tie-in with the existing topography together with the lowering of design standards through the Special Area of Conservation to permit a much smaller project footprint and minimal loss of existing vegetation, and should be considered as an excellent example of how a road project can fit within a sensitive environment.</p>	+ve
<p>Improve road safety, reducing the number of damage slight only and serious accidents, on this section of the A830.</p>	<p>A comparison between 3 years before opening and 1 year after opening personal injury accidents occurring within the vicinity of the project indicates that four (slight) personal injury accidents occurred prior to the opening of the project in comparison to no personal injury accidents in the 1 year period following the opening of the project suggesting an improvement in road safety.</p>	+ve
<p>Provide a value for money solution to improve journey times and level of service for local business, commercial and tourist users of the A830, maintaining the lifeline link to Arisaig, Morar, Mallaig and to the ferry links to the Small Isles: Rum, Muck, Eigg, Canna and to South Uist and Skye.</p>	<p>The project has resulted in significant journey time savings for all vehicles of 4 to 5 minutes.</p> <p>Anecdotal evidence from a local bus operator suggests bus services are more reliable as a result of the project.</p> <p>It is judged that the project is likely to deliver value for money over and above that predicted as part of the project's assessment.</p>	+ve
<p>Aid sustainable economic development, encourage inward investment and creation of business opportunities in the Ardnamurchan and Moidart areas.</p>	<p>Anecdotal evidence from Highlands and Islands Enterprise suggests that the project has had a positive impact on several aspects of local economic development, including increased visitor numbers, improved connectivity and stronger economic ties between Mallaig and Fort William.</p>	+ve
<p>Maintain link to Beasdale Railway Halt and Highland Line.</p>	<p>The project has improved linkages to the Railway Halt and Highland Line through reduced journey times, improved</p>	+ve

Scottish Trunk Road Infrastructure Project Evaluation - Appendix A
A830(T) Arisaig to Loch Nan Uamh

Objective	Commentary	Progress
	<p>journey time reliability and improved pedestrian cycle amenities.</p> <p>A review of the environmental mitigation measures, carried out in July 2011, confirmed that access to the Beasdale Railway Halt had been maintained.</p>	
<p>Fit with land-use policy as identified in Highland Council Structure Plan and Lochaber Local Plan.</p>	<p>The Environmental Statement for the project contains a detailed assessment against the planning policies in place at the time of the project's development and implementation. The assessment concluded that the proposed realignment of the A830(T) between Arisaig and Loch Nan Uamh accords with the policies contained within the Highland Council Structure Plan and the Lochaber Local Plan in respect of their objective of promoting the economic development of the area by improving transport links.</p> <p>The Environmental Statement highlighted areas of potential conflict with development plan policies with regards to the impact of the project on aspects of the natural and built environment and these appear to have been largely mitigated.</p>	<p>+ve</p>
<p>Ensure rural and island communities remain sustainable and strengthen in the longer term, providing improvement in links to employment and for tourism.</p>	<p>Anecdotal evidence from Highlands and Islands Enterprise suggests that the project has improved supply chains and economic linkages between the areas of Mallaig and Arisaig to Fort William.</p> <p>Passenger figures for Caledonian MacBrayne ferry services between Mallaig and Armadale indicate an increase in passenger numbers post-opening, although it cannot be confirmed that this is solely as a result of the road improvement.</p>	<p>+ve</p>
<p>Provide better local community access, aid more efficient delivery of services and improve communications locally.</p>	<p>The project has resulted in significant journey time savings for all vehicles of 4 to 5 minutes indicating a reduction in journey times and an associated improvement in journey time reliability, which suggests an improvement in local</p>	<p>+ve</p>

Scottish Trunk Road Infrastructure Project Evaluation - Appendix A
A830(T) Arisaig to Loch Nan Uamh

Objective	Commentary	Progress
	communications and the delivery of services.	
Enable the area at a regional level to realise its economic development potential in terms of external markets, in particular, tourism, timber and fishing.	Anecdotal evidence from Highlands and Islands Enterprise suggests that the project has improved supply chains and economic linkages between the areas of Mallaig and Arisaig to Fort William.	+ve
Improve access to Arisaig, Morar, Mallaig, the Small Isles, South Uist and Skye for non motorised users of the trunk road corridor, in particular, touring cyclists and walkers.	<p>Whilst a dedicated cycle / pedestrian track has been provided along the length of the improvement and integrates with local path infrastructure in Arisaig, it cannot be confirmed if accessibility has been enhanced along the route as a whole for active travel users.</p> <p>The pedestrian / cycle track was observed as being in regular use during the environmental mitigation measures review.</p>	=
Ensure a good fit with existing access to established Rights of Way and minor roads and tracks used by walkers in the area between Glen Beasdale and Arisaig.	<p>Throughout the project, measures to mitigate impacts to pedestrians and cyclists have been implemented with access to Rights of Way protected, and a dedicated cycle / pedestrian track provided along the length of the improvement.</p> <p>The pedestrian / cycle track was observed as being in regular use during the environmental mitigation measures review.</p>	+ve

Key: +ve No initial indication(s) that objective may not be achieved
 = Progress towards achievement of objective cannot be confirmed
 ○ Initial indication(s) that objective may not be achieved

A.2 A7(T) AUCHENRIVOCK

A.2.1 Introduction

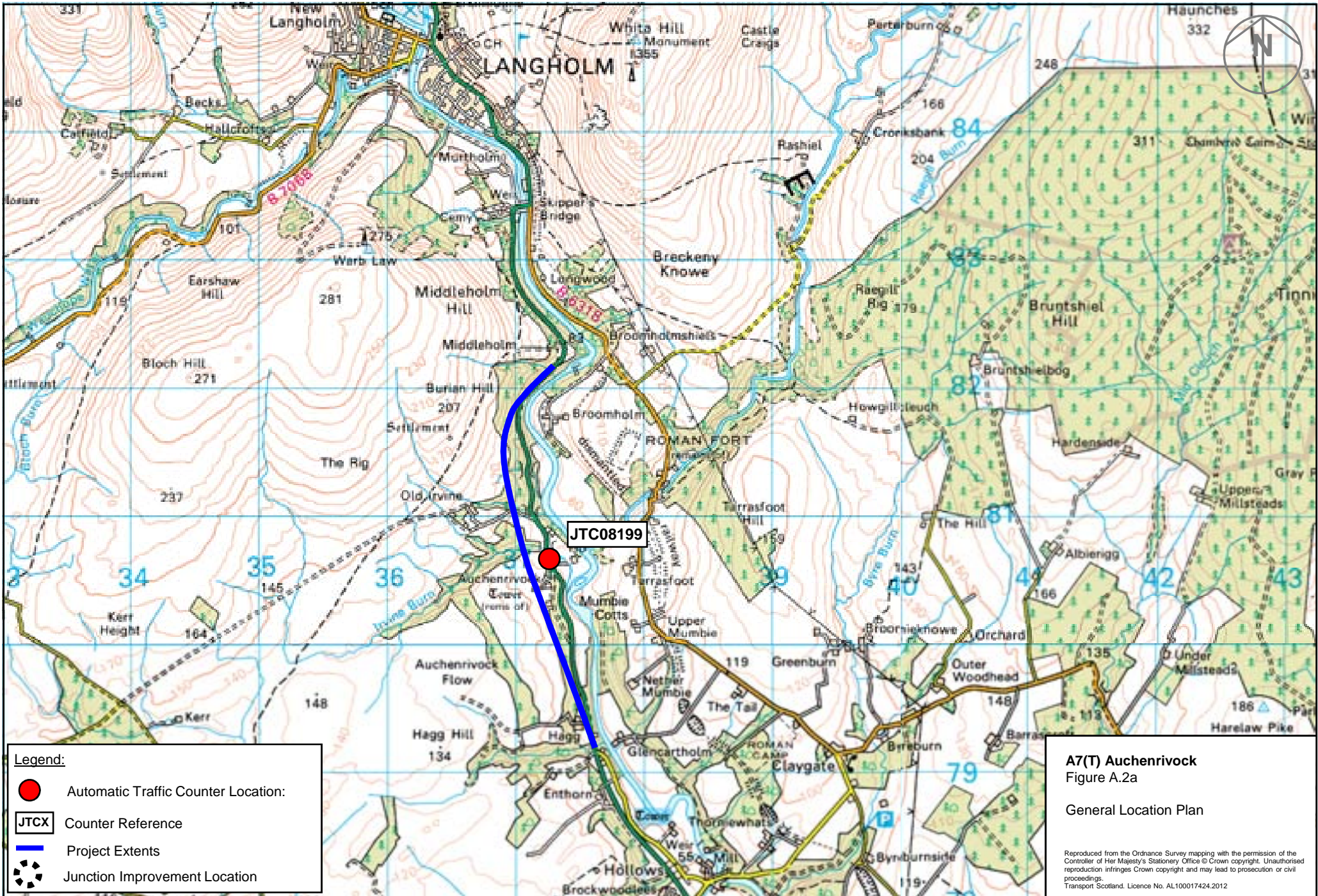
Project Overview

The project, located on the A7(T) approximately 3km south of Langholm, involved the off-line construction of 1.6 kilometres of single 2-lane carriageway and 1.7 kilometres of wide single 2-lane carriageway, to improve overtaking opportunities, on the A7(T) and includes two dedicated right turn ghost island junctions allowing access to Langholm.

The existing route was de-trunked, with part of the carriageway converted into a cycleway / footpath, with the intention of providing local people and tourists with the opportunity to switch to a more sustainable mode of transport.

The general location of the project is shown in Figure A.2a.

The A7(T) Auchentrivock project was officially opened to traffic on 18th June 2009.



Project Objectives

The objectives of the A7(T) Auchenrivock project were set as follows:

- to improve the operational performance, level of service and road safety on the A7 by reducing the effects of driver stress and journey times;
- to improve and increase the number of overtaking opportunities to eradicate the conflicts between long distance users, local and agricultural traffic;
- to incorporate measures for non-motorised users;
- to mitigate the environmental impact of the new works where possible; and
- to achieve good value for money for both taxpayers and transport users.

Evaluation Methodology

The A7(T) Auchenrivock project has been evaluated using network traffic indicators and comparisons against the above objectives and the following criteria:

- Environment;
- Safety;
- Economy;
- Accessibility & Social Inclusion;
- Costs to Government; and
- Value for Money.

As the evaluation focuses on impacts relating to the project objectives, a specific evaluation against the Integration criterion has not been undertaken.

The evaluation is supported by the consideration of network traffic indicators, including traffic volumes, overtaking opportunities and travel times presented in the following section.

A.2.2 Network Traffic

Traffic Volumes

The location of the Automatic Traffic Counter (ATC) within the study area is shown in Figure A.2a.

Comparison Between Pre and Post Opening Traffic Flows

The Annual Average Daily Traffic (AADT) flows pre and post project opening on the A7(T) route within the vicinity of the project are presented in Table A.2.1.

Table A.2.1: A7(T) Auchenrivock – ATC Data

ATC Reference	AADT by Year					
	2006	2007	2008	2009	2010	2011
A7(T) South of Langholm						
JTC08199	3,605	3,570	3,586	Year of Opening	3,431 *	3,434*

* flows based on partial data

A comparison between pre and post opening traffic volumes on the A7(T) south of Langholm indicates that traffic flows in 2010 were around 150 vehicles per day (approximately 4%) lower than 2008 flow levels. Flows in 2011 were consistent with 2010 levels.

Given the nature of the A7(T) Auchenrivock project, changes in traffic are not likely to be as a consequence of changes to the carriageway standard and may be as a result of general reductions in traffic volumes across the wider trunk road network due to the economic downturn experienced during the evaluation period.

Comparison Between Predicted and Actual Traffic Flows

The opening year flow comparisons for the A7(T) Auchenrivock project are based on AADT flows from 2010 as this was the first year of post opening traffic data available from Transport Scotland’s traffic counter within the study area. Whilst the 2010 traffic data only covers the period from August to December, a review of the data from previous years indicates that the average flow over this period is reasonably consistent with the AADT flow.

As part of the project’s appraisal, National Road Traffic Forecasts (NRTF) low and high traffic growth factors were applied to the modelled 2009 opening year traffic flows to derive future modelled assessment year traffic flows. Predicted traffic flows for 2010 have been derived by interpolating between the modelled assessment year, design network flows.

A summary of the actual and predicted traffic data is shown in Table A.2.2 below.

Table A.2.2: A7(T) Auchenrivock – Traffic Analysis Summary

ATC Ref	Actual AADT*	Predicted AADT			% Difference (Predicted – Actual) / Actual		
		Low	60/40	High	Low	60/40	High
A7(T) South of Langholm							
JTC08199	3,431	3,615	3,740	3,926	5.4%	9.0%	14.4%

* 2010 flows based on available data (August to December)

The comparison between predicted and actual AADT flows in Table A.2.2 indicates that the predicted 2010 flow (derived by interpolating between the modelled assessment year, design network flows) was 5% and 14% greater than the observed 2010 flow under low and high traffic growth forecast scenarios respectively.

Whilst this comparison indicates that traffic growth on the A7(T) has fallen short of the assumed NRTF forecasts, the difference is within accepted limits. It is recognised that there has been a general reduction in traffic volumes across the wider trunk road network in recent years due to the economic downturn that may in part account for the difference.

Carriageway Standard Assessment

In order to satisfy the project objectives, a wide single carriageway was constructed over a section of the A7(T), at Auchenrivock, providing increased overtaking opportunities to help reduce platooning as well as to reduce journey times and improve journey time reliability.

An assessment of the carriageway standard according to TA 46/97 – Economic Assessment and Recommended Flow Ranges for New Rural Road Links, which applied at the time of the project design, is shown in Table A.2.3, based on the observed 2010 traffic flow.

Table A.2.3: A7(T) Auchenrivock – Assessment of Carriageway Standard (TA 46/97)

Opening Year AADT*	TA 46/97 Standard	Constructed Standard
3,431	Single 2-Lane	Single 2-Lane & Wide Single 2-Lane

* 2010 flows based on available data (August to December)

Although the carriageway assessment indicates that the observed 2010 flow lies within the flow range appropriate for a single 2-lane standard of carriageway, given the project objectives, the constructed wide single 2-lane carriageway section is considered appropriate.

Overtaking Opportunities

Post Opening Overtaking Opportunities

Based on the evaluation of other projects with a comparable standard of carriageway for which overtaking surveys have been carried out, the provision of the wide single 2-lane carriageway is judged to have a positive impact on the number of overtaking manoeuvres. As a consequence of providing overtaking opportunities, the project is also likely to help reduce platooning.

Stakeholder feedback

Dumfries and Galloway Council has indicated that overtaking opportunities have increased significantly as a result of the project.

Travel Times

Change in Travel Times

Based on the evaluation of other projects with a comparable standard of carriageway for which journey time data is available, the provision of the wide single 2-lane carriageway is judged to reduce journey times.

Stakeholder feedback

Dumfries and Galloway Council has indicated that the project has had a positive impact on journey times and journey time reliability.

A.2.3 Environment

Review of Environmental Mitigation Measures

The environmental mitigation measures originally proposed for the A7(T) Aucherivock project were obtained from the project's Environmental Statement. A review of the environmental mitigation measures was carried out in July 2011, which confirmed that the majority of measures committed within the Environmental Statement were in place and were providing appropriate levels of mitigation.

Noise and Air Quality

Given the rural nature of the A7(T) Aucherivock project, no significant impact on noise and air quality is expected. It is therefore not appropriate to evaluate the project's impact on noise and air quality.

Environment: Key Findings

The review of mitigation measures implemented for the A7(T) Auchenrivock project confirmed that the majority of measures committed within the Environmental Statement were in place. Whilst some variations from the proposed mitigation measures had been identified, these were not considered to have had a material detrimental impact on the general integration of the project into its surrounding.

A.2.4 Safety

Accidents

Comparison Between Pre and Post Opening Personal Injury Accident Numbers

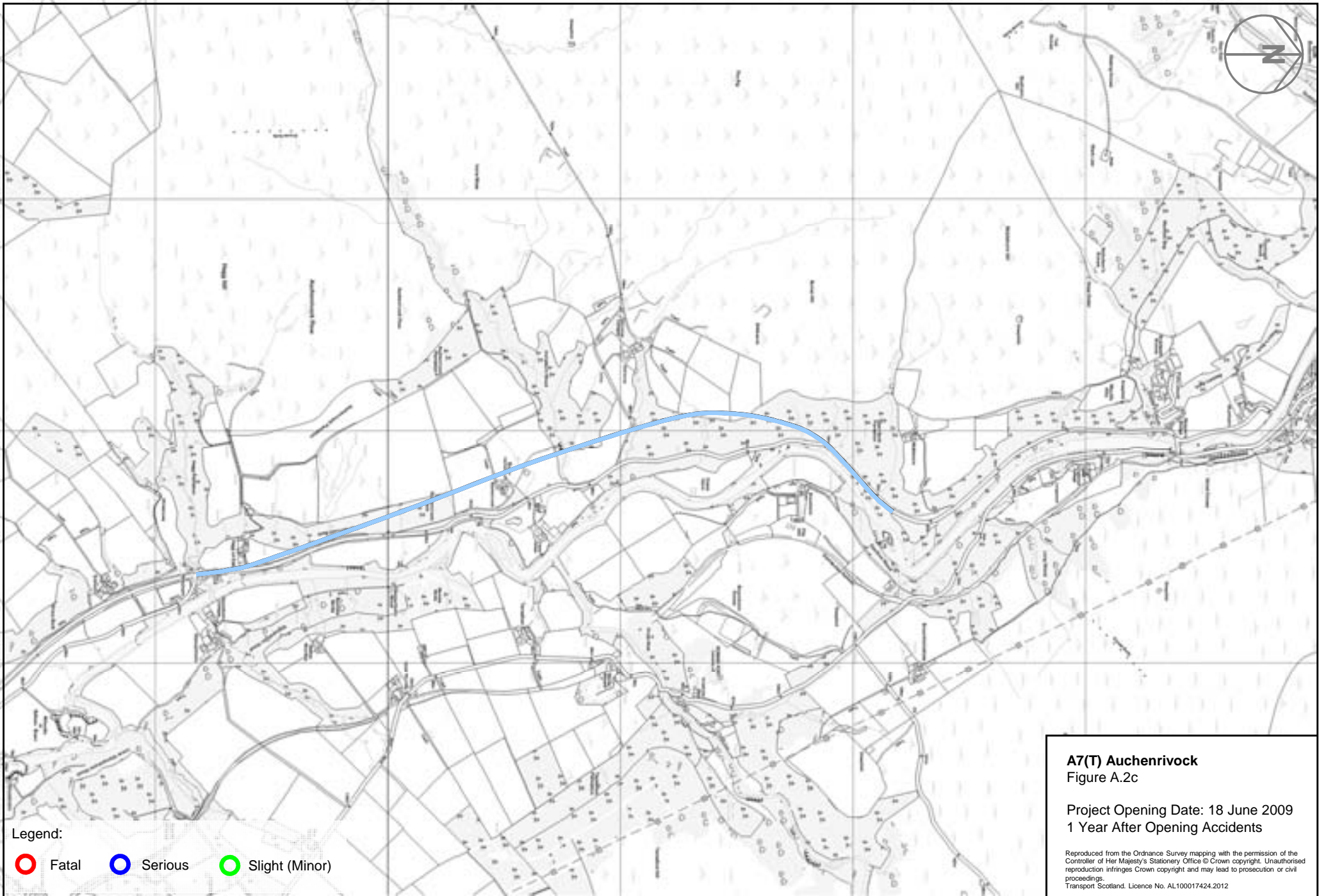
The locations and severities of personal injury accidents occurring within the vicinity of the A7(T) Auchenrivock project 3 years before and 1 year after project completion are shown in Figures A.2b and A.2c.



A7(T) Auchenrivock
Figure A.2b

Project Opening Date: 18 June 2009
3 Years Before Opening Accidents

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A7(T) Auchenrivock
Figure A.2c

Project Opening Date: 18 June 2009
1 Year After Opening Accidents

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A summary of the accident data is shown in Table A.2.4.

Table A.2.4: A7(T) Auchenrivock – Accident Data Summary

Period	Fatal	Serious	Slight	Total Accidents
3 Years Before				
A7(T)	1	0	0	1
1 Year After				
A7(T)	0	0	0	0

As can be seen from Table A.2.4, no personal injury accidents occurred in the 1 year period following the opening of the project in comparison to one personal injury accident (fatal) in the 3 years before opening, suggesting a potential improvement in road safety.

Road Safety Audits

The Stage 4 Road Safety Audit (RSA) was carried out in August 2010. The RSA report confirmed that no personal injury accidents had occurred within the vicinity of the project in the 1 year period after project opening. The report noted that a damage only accident had occurred within the vicinity of the project in the 1 year after opening and involved a single vehicle losing control and colliding with a safety barrier. An issue surrounding the speed of vehicles on the new section has been noted and the local police are monitoring the situation.

It was also noted that during a period of adverse weather conditions in December 2009, approximately 20 vehicles were stranded on the 8% uphill gradient at the northern end of the project due to the blizzard conditions.

The audit concluded that the new road layout at Auchenrivock is operating safely and efficiently.

Safety: Key Findings

An assessment of the 1 year post opening personal injury accidents and a review of the Stage 4 RSA report, suggests that while an issue surrounding the speed of vehicles on the new section has been noted, the A7(T) Auchenrivock project is operating safely.

A.2.5 Economy

Transport Economic Efficiency

Comparison Between Predicted and Actual Traffic Flows

The comparison between predicted and actual traffic flows, presented in section A.2.2, can be considered a proxy for whether the predicted economic benefits of the project are likely to be realised.

The comparison indicates that the predicted 2010 flows were between 5% and 15% greater than the observed 2010 flows on the A7(T) depending on the growth scenario considered. This overestimation may in part be due to the general economic downturn.

Economy: Key Findings

The difference between predicted and actual AADT flows suggests that, due to external factors that could not have readily been foreseen at the time of assessment, the economic benefits of the project will have been overestimated.

A.2.6 Accessibility & Social Inclusion

Community Accessibility

It is likely that accessibility improvements will have been felt by local active travel users in and around Auchenrivock due to the provision of the new cycleway / footpath. Public transport uses the de-trunked A7 route and bus passengers are likely to feel safer and less intimidated by traffic as a result.

Cycling Audits

A Cycle Audit for the A7(T) Auchenrivock project was carried out in June 2009, as part of the RSA.

The audit report notes the following to address potential issues with the measures provided for cyclists as part of the A7(T) Auchenrivock project:

- Signage for cyclists and motor vehicles be improved at access points to the bypassed carriageway;
- Bollards be erected at the access point to the bypassed carriageway; and
- Reflectors be attached at the northern access to the bypassed carriageway to mitigate risk to cyclists.

Accessibility & Social Inclusion: Key Findings

The Cycle Audit carried out as part of the RSA for the A7(T) Auchenrivock project provides recommendations to address potential issues with the measures provided for cyclists.

A.2.7 Cost to Government

Investment Costs

Comparison Between Predicted and Out-turn Costs

The out-turn and predicted project costs are shown in Table A.2.5.

Table A.2.5: A7(T) Auchenrivock – Project Cost Summary

	Out-turn Cost		Predicted Cost		Difference (Out-turn - Est)
	@ May 11	Mid 98 Prices in 1998 at 3.5% Discount	Nov 06 Prices	Mid 98 Prices in 1998 at 3.5% Discount	Mid 98 Prices in 1998 at 3.5% Discount
Total	£10,246,832	£5,580,931	£7,955,000	£4,600,750	£980,181 (21%)

Cost to Government: Key Findings

The out-turn cost of the A7(T) Auchenrivock project is approximately £1.0m (21%) greater than was predicted at the time of assessment.

A.2.8 Value for Money

Initial Indications

The economic appraisal results for the A7(T) Auchenrivock project predicted a Net Present Value (NPV) of £1.19m and Benefit to Cost Ratio (BCR) of 1.19 under the 60/40 traffic growth forecast scenario.

Based on the comparisons presented in sections A.2.5 and A.2.7, which suggest that the benefits may have been overestimated and indicate that the out-turn cost is greater than predicted, the NPV and BCR of the project are unlikely to be as great as predicted.

Value for Money: Key Findings

Although the NPV and BCR are unlikely to be as great as predicted at the time of assessment, it is judged that the project will continue to provide benefits to road users.

A.2.9 Achievement of Objectives

As specific indicators to measure the performance of the A7(T) Auchenrivock project against its objectives have not been developed, an initial indication of how the project is progressing towards achieving its objectives is based on the pre opening data available, supplemented by post opening data collected as part of the evaluation.

Initial Indications

A summary of the evaluation, providing an indication of how the A7(T) Auchenrivock project is progressing towards achieving its objectives, is presented in Table A.2.6.

Table A.2.6: A7(T) Auchenrivock – Progress Towards Achieving Objectives

Objective	Commentary	Progress
<p>Improve the operational performance, level of service and road safety on the A7 by reducing the effects of driver stress and journey times.</p>	<p>The provision of the wide single 2-lane carriageway is judged to have a positive impact on the number of overtaking manoeuvres, which as a consequence helps to reduce platooning.</p> <p>Based on the evaluation of other projects with a comparable standard of carriageway for which journey time data is available, the provision of the wide single 2-lane carriageway is judged to have a positive impact on journey times.</p> <p>A comparison between 3 years before opening and 1 year after opening personal injury accidents occurring within the vicinity of the project indicates that one personal injury accidents (fatal) occurred prior to the opening of the project in comparison to no personal injury accidents in the 1 year period following the opening of the project suggesting a potential improvement in road safety.</p>	<p>+ve</p>
<p>Improve and increase the number of overtaking opportunities to eradicate the conflicts between long distance users, local and agricultural traffic.</p>	<p>The provision of the wide single 2-lane carriageway is judged to have a positive impact on the number of overtaking manoeuvres, which as a consequence helps to reduce platooning.</p> <p>Stakeholder feedback from Dumfries and Galloway Council supports this assertion.</p>	<p>+ve</p>
<p>Incorporate measures for non-motorised users.</p>	<p>As part of the project, a shared cycle and pedestrian facility was provided which utilised the redundant section of the bypassed A7.</p>	<p>+ve</p>
<p>Mitigate the environmental impact of the new works where possible.</p>	<p>The majority of measures committed within the Environmental Statement are in place. Whilst some variations from the proposed mitigation measures have been identified, these are not considered to have had a material detrimental impact on the general integration of the project into its surrounding.</p>	<p>+ve</p>

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A7(T) Auchenrivock

Objective	Commentary	Progress
Achieve good value for money for both taxpayers and transport users.	Although the NPV and BCR are unlikely to be as great as predicted at the time of assessment, the A7(T) Auchenrivock project can be expected to provide benefits to transport users.	○

Key: +ve No initial indication(s) that objective may not be achieved
 = Progress towards achievement of objective cannot be confirmed
 ○ Initial indication(s) that objective may not be achieved

A.3 A9(T) BANKFOOT

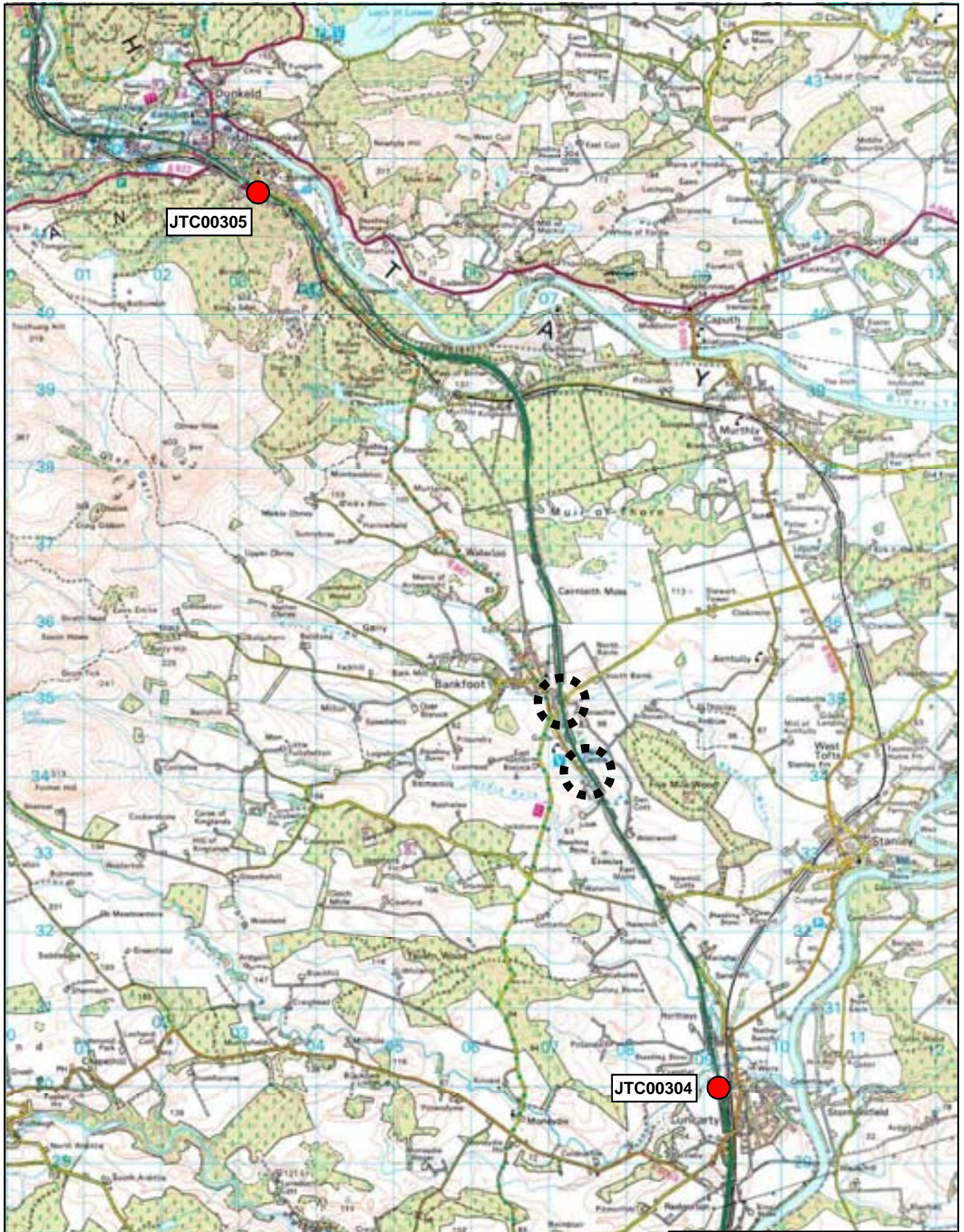
A.3.1 Introduction

Project Overview

The project involved removing right turn manoeuvres across the main A9(T) carriageway to/from the B867 and Bankfoot Village through improvements to the existing A9(T)/B867 junction and the realignment of a minor road to the north, providing left-in, left-out junctions on the A9(T) for both northbound and southbound traffic.

The general location of the project is shown in Figure A.3a.

The A7(T) Bankfoot project was officially opened to traffic on 28th August 2009.



Legend:

- Automatic Traffic Counter Location:
- JTCX Counter Reference
- Project Extents
- Junction Improvement Location

A9(T) Bankfoot
 Figure A.3a
 General Location Plan

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Project Objectives

The objectives of the A9(T) Bankfoot project reflect those set for the A9(T) route, which were as follows:

- to provide a good, quick and reliable inter urban road link;
- to improve road safety;
- to minimise the intrusion of the road and traffic on the environment; and
- to achieve good value for money.

Evaluation Methodology

The A9(T) Bankfoot project has been evaluated using network traffic indicators and comparisons against the above objectives and the following criteria:

- Environment;
- Safety;
- Economy;
- Costs to Government; and
- Value for Money.

As the evaluation focuses on impacts relating to the project objectives, specific evaluations against the Integration and Accessibility & Social Inclusion criteria have not been undertaken.

The evaluation is supported by the consideration of network traffic indicators, including traffic volumes and travel times presented in the following section.

A.3.2 Network Traffic

Traffic Volumes

The locations of the Automatic Traffic Counters (ATCs) within the study area are shown in Figure A.3a.

Comparison Between Pre and Post Opening Traffic Flows

The Annual Average Daily Traffic (AADT) flows pre and post project opening on the A9(T) route within the vicinity of the project are presented in Table A.3.1.

Table A.3.1: A9(T) Bankfoot – ATC Data

ATC Reference	AADT by Year					
	2006	2007	2008	2009	2010	2011
A9(T) North of Luncarty						
JTC00304	16,270	16,497	16,110	Year of Opening	15,907	16,194
A9(T) at Dunkeld						
JTC00305	13,361	13,450	13,567	Year of Opening	12,919	13,772

A comparison between pre and post opening traffic volumes on the A9(T) north of Luncarty indicates that traffic flows in 2010 were around 200 vehicles per day (approximately 1%) lower than 2008 flow levels. Flows in 2011 were marginally higher than 2008 levels. Traffic volumes on the A9(T) at Dunkeld have seen a reduction of around 600 vpd (approximately 4%) between 2008 and 2010 with flows in 2011 around 200 vpd (approximately 2%) higher than 2008 levels.

Given the nature of the A9(T) Bankfoot project, changes in traffic are not likely to be as a consequence of changes to the junction layout and carriageway.

Comparison Between Predicted and Actual Traffic Flows

The opening year flow comparisons for the A9(T) Bankfoot project are based on AADT flows from 2010 as this was the first full year of reliable traffic data available from Transport Scotland’s traffic counters within the vicinity of the project.

As part of the project’s appraisal, National Road Traffic Forecasts (NRTF) central traffic growth factors were applied to the 2005 base year traffic flows to derive opening and future modelled assessment year traffic flows. Predicted traffic flows for 2010 were derived by factoring the 2005 base year flows used in the economic assessment with NRTF central traffic growth factors.

A summary of the actual and the predicted traffic data is shown in Table A.3.2 below.

Table A.3.2: A9(T) Bankfoot – Traffic Analysis Summary

ATC Ref	Actual AADT*	Predicted AADT	% Difference (Predicted – Actual) / Actual
		Central	Central
A9(T) North of Luncarty			
JTC00304	15,907	13,504	-15.1%
A9(T) at Dunkeld			
JTC00305	12,919	9,710	-24.8%

* 2010 flows (first full year of ATC data available)

The comparison between predicted and actual AADT flows in Table A.3.2 indicates that the predicted 2010 flows were between 15% and 25% lower than the observed 2010 flows.

Carriageway Standard Assessment

As the A9(T) Bankfoot project involved the construction of an improved junction layout, as opposed to a new section of carriageway, it has not been necessary to carry out a carriageway standard assessment.

Travel Times

Change in Travel Times

Whilst journey times for some local trips accessing the A9(T) may have marginally increased as a result of the revised junction layout due to the removal of right turns to/from Bankfoot village, it can be expected that journey times on the A9(T) carriageway itself over the extents of the improvement will have reduced, and journey time reliability improved, in both directions of travel as a result of removing delays to mainline traffic caused by right turning vehicles.

A.3.3 Environment

Review of Environmental Mitigation Measures

The environmental mitigation measures originally proposed for the A9(T) Bankfoot project were obtained from the project's Environmental Statement. A review of the environmental mitigation measures was carried out in July 2011, which confirmed that the majority of measures committed within the Environmental Statement were in place and were providing appropriate levels of mitigation.

As part of the review the following areas were identified that require maintenance:

- several locations throughout the project where the growth of weeds has been significant;
- rank weed growth on the rock blanket located on the north eastern cutting slope; and
- the SUDS pond which has been overgrown by weeds including dock and clover.

Noise and Air Quality

As no significant impact on noise and air quality is expected as a result of the A9(T) Bankfoot project, it is not appropriate to evaluate the project's impact on noise and air quality.

Environment: Key Findings

The review of mitigation measures for the A9(T) Bankfoot project confirmed that the majority of measures committed within the Environmental Statement were in place. Whilst some variations from the proposed mitigation measures had been identified, these were not considered to have had a material detrimental impact on the general integration of the project into its surrounding.

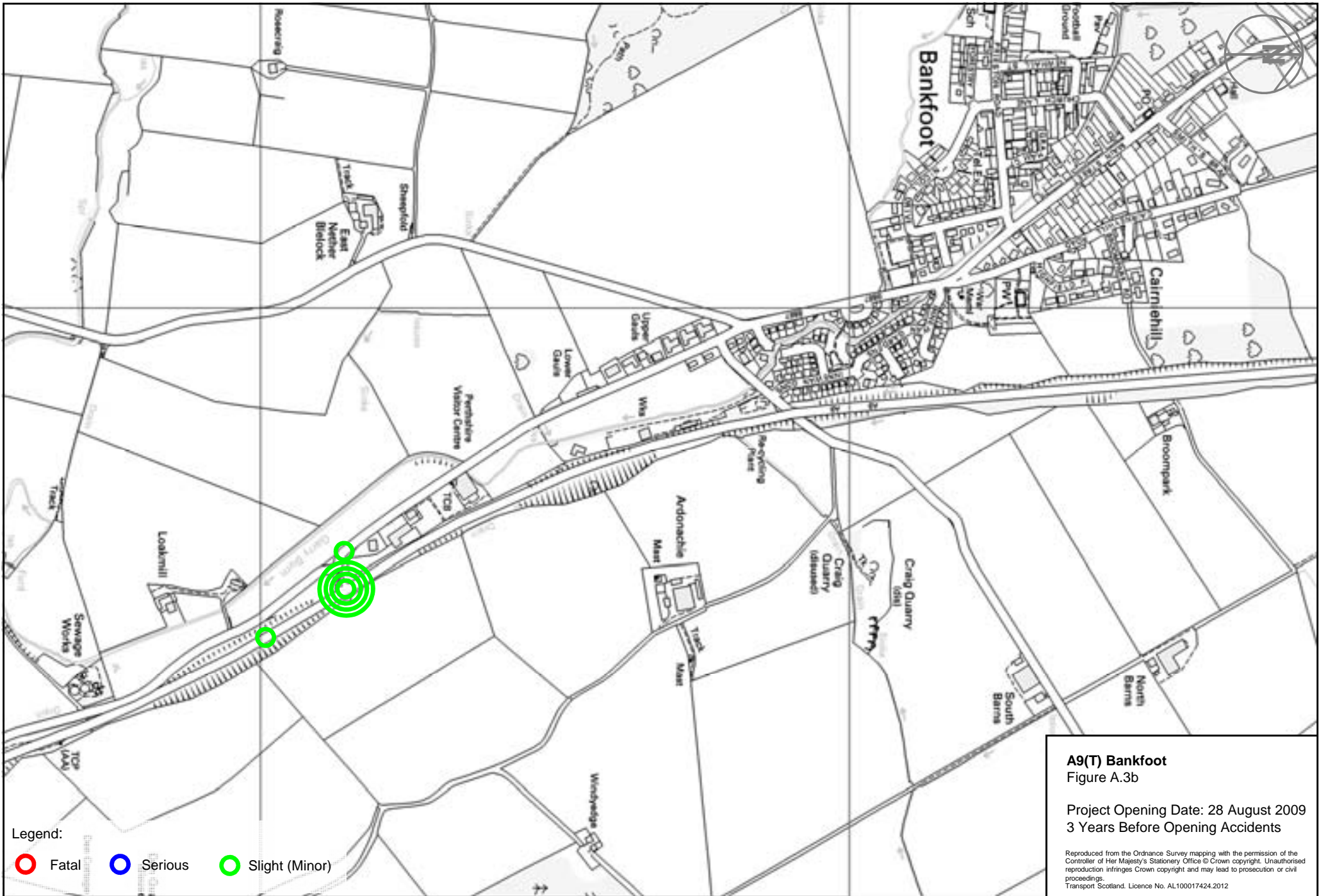
Maintenance is required to avoid any significant impact on the tree and hedgerow planting within the vicinity of the project.

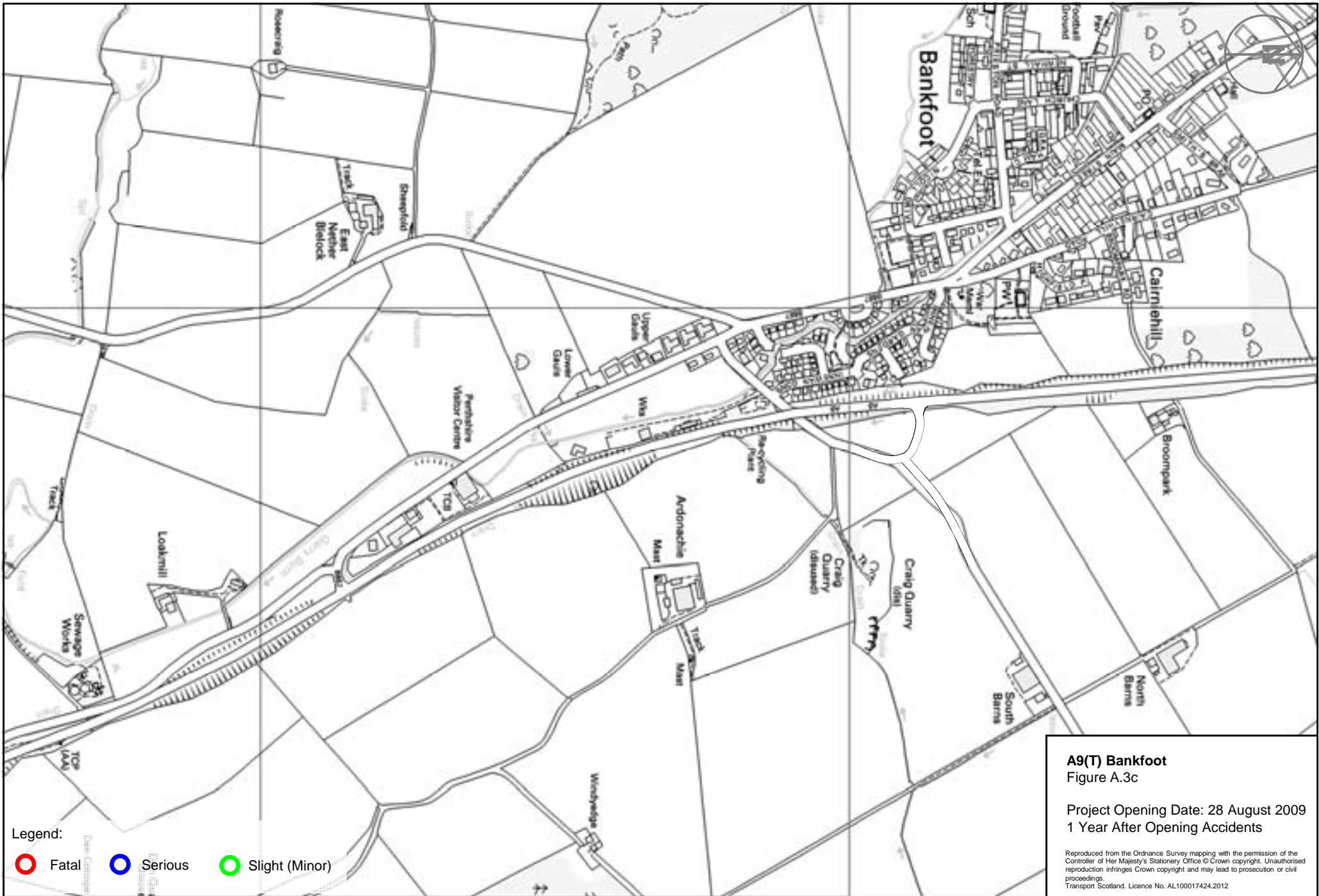
A.3.4 Safety

Accidents

Comparison Between Pre and Post Opening Personal Injury Accident Numbers

The locations and severities of accidents occurring within the vicinity of the A9(T) Bankfoot project 3 years before and 1 year after project completion are shown in Figures A.3b and A.3c.





A summary of the personal injury accident data is shown in Table A.3.3.

Table A.3.3: A9(T) Bankfoot – Accident Data Summary

Period	Fatal	Serious	Slight	Total Accidents
3 Years Before				
A9(T)	0	0	6	6
1 Year After				
A9(T)	0	0	0	0

As can be seen in Table A.3.3, no personal injury accidents occurred in the 1 year period following the opening of the project in comparison to six (slight) personal injury accidents in the 3 years before opening, suggesting a potential improvement in road safety.

Road Safety Audits

The Stage 4 Road Safety Audit (RSA) was carried out in May 2012. The RSA report confirmed that no personal injury accidents had occurred within the vicinity of the project in the 1 year after project opening. The RSA noted a skid risk from vehicles overrunning filter drain material and scattering it on the carriageway surface.

Safety: Key Findings

An assessment of the 1 year post opening personal injury accidents and a review of the Stage 4 RSA report, suggests that the A9(T) Bankfoot project is operating safely.

A skid risk from vehicles overrunning the filter drain and scattering it on the carriageway surface has been noted.

A.3.5 Economy

Transport Economic Efficiency

The comparison between predicted and actual traffic flows, presented in section A.3.2, can be considered a proxy for whether the predicted economic benefits of the project are likely to be realised.

Comparison Between Predicted and Actual Traffic Flows

The comparison between predicted and actual traffic flows indicates that the predicted 2010 flows were 20% to 30% lower than the observed 2010 flows on the A9(T). The project may, therefore, deliver additional benefits to road users than those predicted as part of the project's appraisal.

Economy: Key Findings

The difference between predicted and actual AADT flows is likely to have resulted in an underestimation of road user benefits.

A.3.6 Cost to Government

Investment Costs

Comparison Between Predicted and Out-turn Costs

The out-turn and predicted project costs are shown in Table A.3.4.

Table A.3.4: A9(T) Bankfoot – Project Cost Summary

	Out-turn Cost		Predicted Cost		Difference (Out-turn - Est)
	@ May 11	Mid 02 Prices in 2002 at 3.5% Discount	Aug 07 Prices	Mid 02 Prices in 2002 at 3.5% Discount	Mid 02 Prices in 2002 at 3.5% Discount
Total	£3,178,335.98	£2,067,298	£1,875,000	£1,295,744	£771,554 (60%)

Cost to Government: Key Findings

The out-turn cost of the A9(T) Bankfoot project was approximately £0.8m (60%) greater than was predicted at the time of the assessment.

A.3.7 Value for Money

Initial Indications

The economic appraisal results for the A9(T) Bankfoot project predicted a Net Present Value (NPV) of £0.97m and Benefit to Cost Ratio (BCR) of 1.97 under the central traffic growth forecast scenario.

Based on the comparisons presented in sections A.3.5 and A.3.6, which suggest that the benefits may have been underestimated and indicate that the out-turn cost is greater than predicted, the NPV and BCR of the project is unlikely to be as great as predicted.

Value for Money: Key Findings

Whilst the NPV and BCR are unlikely to be as great as predicted at the time of assessment, it is judged that the project will continue to provide a benefit to road users.

A.3.8 Achievement of Objectives

As specific indicators to measure the performance of the A9(T) Bankfoot project against the route objectives have not been developed, an initial indication of how the project is progressing towards achieving its objectives is based on the pre opening data available, supplemented by post opening data collected as part of the evaluation.

Initial Indications

A summary of the evaluation, providing an indication of how the A9(T) Bankfoot project is progressing towards achieving its objectives, is presented in Table A.3.5.

Table A.3.5: A9(T) Bankfoot – Progress Towards Achieving Objectives

Objective	Commentary	Progress
To provide a good, quick and reliable inter urban road link.	Whilst journey times for some local trips accessing the A9(T) may have marginally increased as a result of the revised junction layout due to the removal of right turns to/from Bankfoot village, it can be expected that journey times on the A9(T) carriageway itself over the extents of the improvement will have reduced, and journey time reliability improved, in both directions of travel.	+ve
To improve road safety.	A comparison between 3 years before opening and 1 year after opening personal injury accidents occurring within the vicinity of the project indicates that six (slight) personal injury accidents occurred prior to the opening of the project in comparison to no personal injury accidents in the 1 year period following the opening of the project suggesting an improvement in road safety.	+ve
To minimise the intrusion of the road and traffic on the environment.	Environmental and landscaping measures have been implemented to help the project fit within the existing open landscape.	+ve
To achieve good value for money.	Although the NPV and BCR are unlikely to be as great as predicted at the time of assessment, it is judged that the A9(T) Bankfoot project will continue to provide benefits to transport users.	○

Key: +ve No initial indication(s) that objective may not be achieved
 = Progress towards achievement of objective cannot be confirmed
 ○ Initial indication(s) that objective may not be achieved

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Gheibhear lethbhreacan a bharrachd ann an cruth ris an èistear, ann an clò mòr agus ann an cànan coimhearsnachd. Cuir fios gu:

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