

**TRANSPORT SCOTLAND
SCOTTISH TRUNK ROAD INFRASTRUCTURE
PROJECT EVALUATION**

1YA Evaluation Report for A9(T) Crubenmore Extension

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1YA Evaluation Report for A9(T) Crubenmore Extension

CONTENTS

	Page
1 SUMMARY OF IMPACTS	6
1.1 Operational Indicators – How is the scheme operating?	6
1.2 Process Indicators – How well was the scheme implemented?	6
1.3 Objectives – Is the scheme on track to meet its objectives?	7
1.4 Costs to Government – Is the scheme delivering value for money?	7
2 INTRODUCTION	9
2.1 Background to Project Evaluation	9
2.2 Evaluation Reporting	10
3 A9(T) CRUBENMORE EXTENSION	13
3.1 Introduction	13
3.2 Evaluation Methodology	15
3.3 The operation of the scheme and process evaluation	16
3.4 Environment	21
3.5 Safety	25
3.6 Economy	28
3.7 Accessibility & Social Inclusion	28
3.8 Cost to Government	30
3.9 Value for Money	30
3.10 Progress Towards Achieving Objectives	31
A METHODOLOGY AND DATA SOURCES	35
A.1 Overview	35
A.2 Network Traffic Indicators	35
A.3 Environmental	38
A.4 Safety	38
A.5 Economy	39
A.6 Integration	40
A.7 Accessibility & Social Inclusion	40
A.8 Costs to Government	40
A.9 Value for Money	41
A.10 Achievement of Objectives	41
B ENVIRONMENTAL ANALYSIS	

TABLES

	Page	
Table 2.1	Summary Details – A9(T) Crubenmore Extension	10
Table 3.1:	A9(T) Crubenmore Extension – ATC Data	16
Table 3.2:	A9(T) Crubenmore Extension – Traffic Analysis Summary	17
Table 3.3:	A9(T) Crubenmore Extension – Travel Time Data	20
Table 3.4:	A9(T) Crubenmore Extension – Predicted vs Actual Travel Time Summary	21
Table 3.5:	A9(T) Crubenmore Extension – Accident Data Summary	25
Table 3.6:	A9(T) Crubenmore Extension – Project Cost Summary	30
Table 3.7:	A9(T) Crubenmore Extension – Progress Towards Achieving Objectives	32

FIGURES

Figure 2.1: Locations of Projects Evaluated

Figure 3.1: A9(T) Crubenmore Extension – General Location Plan

Figure 3.2: A9(T) Crubenmore Extension – Journey Time Survey Plan

Figure 3.3a: A9(T) Crubenmore Extension – 3 Years Before Opening
Accidents

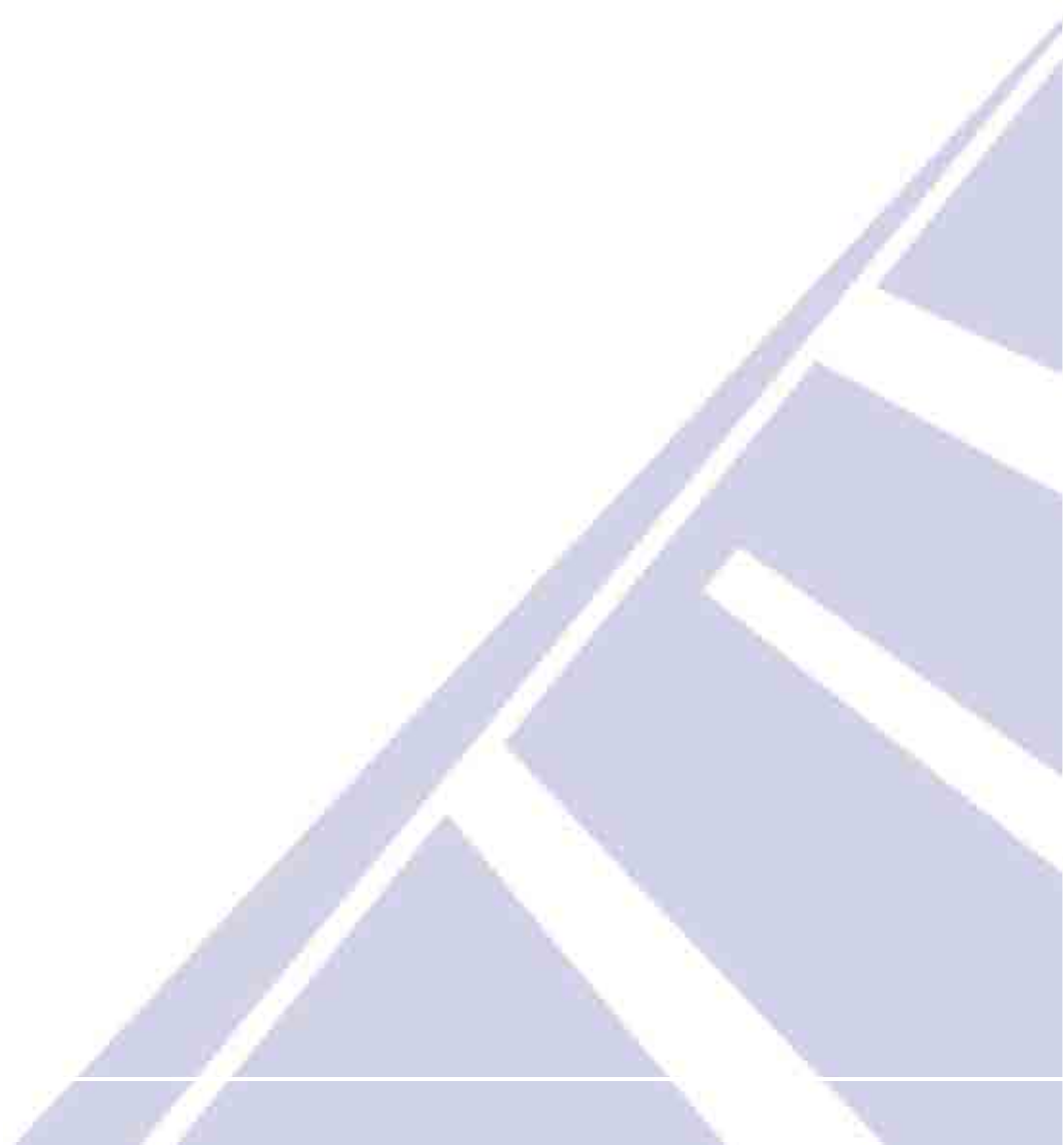
Figure 3.3b: A9(T) Crubenmore Extension – 1 Year After Opening Accidents

GLOSSARY

The following abbreviations have been used in this report:

AADT	Annual Average Daily Traffic
ATC	Automatic Traffic Counter
BCR	Benefit to Cost Ratio
D2AP	Dual 2-Lane All Purpose Carriageway
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

SUMMARY OF IMPACTS



SCOTTISH TRUNK ROAD INFRASTRUCTURE **PROJECT EVALUATION**

TRANSPORT **SCOTLAND**

1 SUMMARY OF IMPACTS

This section provides a short summary of the key elements contained within this One Year After Evaluation report of the A9(T) Crubenmore Extension scheme.

1.1 Operational Indicators – How is the scheme operating?

The scheme has had no significant impact on traffic volumes within the vicinity of the scheme. Given the improvement incorporates an on-line upgrade of the existing carriageway from single to dual carriageway, this is as expected.

Average journey times for strategic traffic using the A9(T) have reduced following the opening of the scheme, with savings of between approximately 30 seconds and 2 minutes observed on the section between Dalwhinnie and Kingussie.

The scheme is operating safely in its first year of operation, with only 1 accident occurring within the vicinity of the scheme. This accident was not attributable to the design or layout of the scheme.

1.2 Process Indicators – How well was the scheme implemented?

Process Indicators provide evaluation across the key elements of project cost, programme and process.

The scheme followed standard processes with the Environmental Statement and Draft Side Roads Order published on 27th February 2007. The Draft Compulsory Purchase Order was published in 21st March 2008. The made Side Roads Order and Compulsory Purchase Order were published on 27 November 2009. It was tendered as a Fixed Price Lump Sum, Employer's Design Contract. Construction commenced in January 2011 and the scheme was delivered on programme in September 2011 at a lower cost than predicted.

The majority of the mitigation which was included within the Environmental Statement has been implemented on site, is in good condition and is operating as expected. 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 surroundings.

A Stage 4 RSA was carried out within the vicinity of the scheme and confirmed that one minor accident has occurred in the period 1 year after opening, however no conclusions can be drawn that would suggest road safety deficiencies in the scheme.

SCOTTISH TRUNK ROAD INFRASTRUCTURE PROJECT EVALUATION

TRANSPORT **SCOTLAND**

A Stage 3 Cycle Audit was carried out and considered the specific cycle facilities provided as part of the proposals. The audit concluded that the cycling provision included as part of the project were satisfactory.

No Disability Discrimination Act (DDA) Audit was carried out, as no relevant interested user groups were identified within the extents of this rural scheme.

1.3 Objectives – Is the scheme on track to meet its objectives?

The nature of the scheme (dual carriageway in both northbound and southbound directions) has enhanced overtaking opportunities.

Journey time data (before and after the scheme implementation) suggest that the scheme has been successful in reducing journey times for car traffic, a key objective of the scheme.

As part of the scheme, a dedicated cycle and footway was maintained, albeit for the low numbers of cyclists and pedestrians believed to use the route.

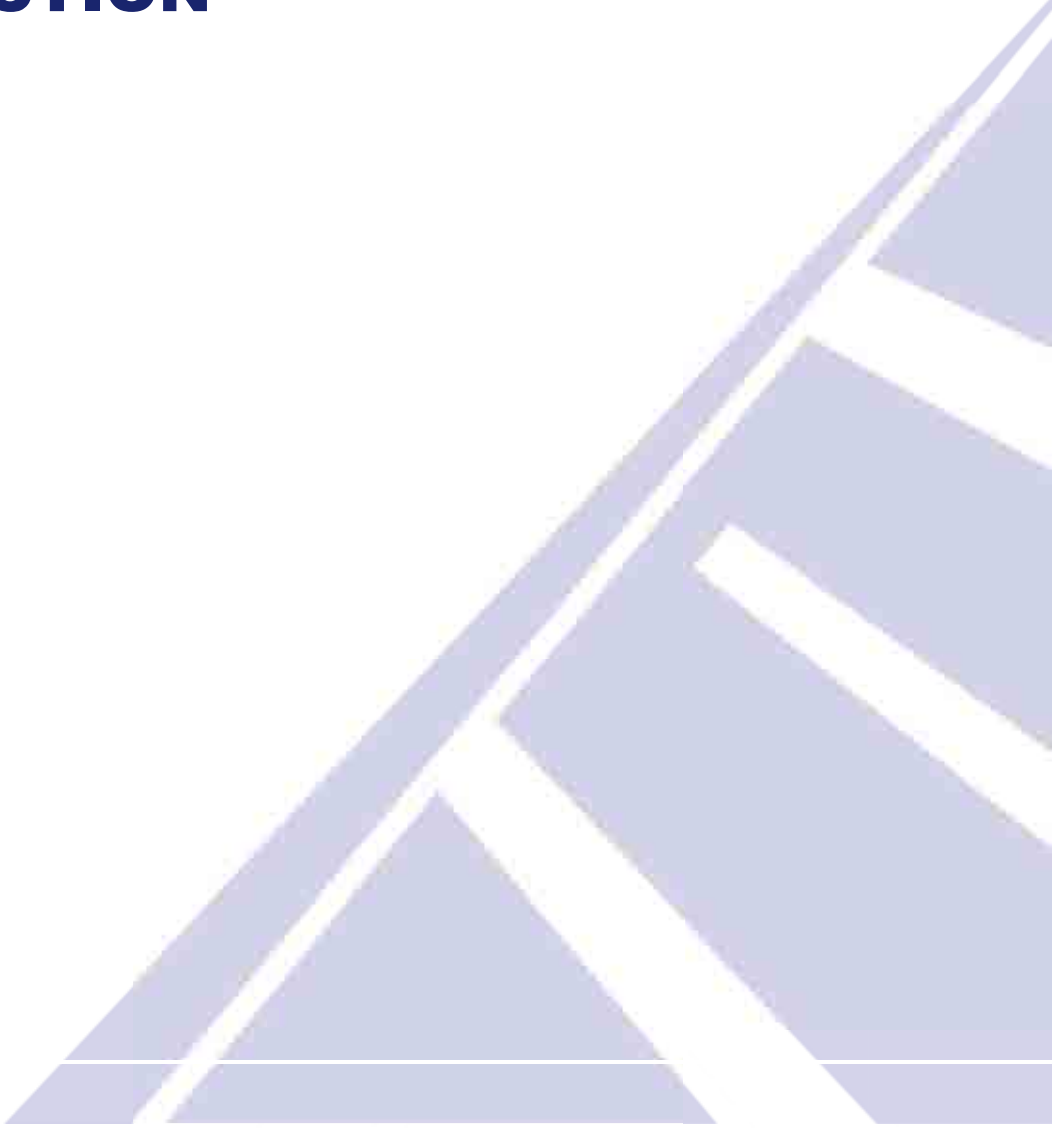
Whilst the scheme is operating safely with only one accident occurring in its first year of operation, it is too early to determine whether the scheme has delivered any road safety benefits, a sub-objective of the scheme. This will be determined after at least three years when the number of accidents can be compared pre and post scheme.

1.4 Costs to Government – Is the scheme delivering value for money?

In combination with other overtaking projects previously implemented on the A9 (T) such as at Carrbridge and Moy and the strategic dualling programme of the route currently being progressed by Transport Scotland, the Crubenmore scheme can be expected to provide benefits to transport users and help encourage economic development within northern Scotland and beyond. The NPV and BCR for this scheme in particular may be greater than those predicted at the time of assessment which suggests that the scheme provides value for money.

SCOTTISH TRUNK ROAD INFRASTRUCTURE
PROJECT EVALUATION
TRANSPORT **SCOTLAND**

INTRODUCTION



SCOTTISH TRUNK ROAD INFRASTRUCTURE

PROJECT EVALUATION

TRANSPORT **SCOTLAND**

2 INTRODUCTION

2.1 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.

SCOTTISH TRUNK ROAD INFRASTRUCTURE PROJECT EVALUATION

TRANSPORT **SCOTLAND**

Furthermore, Scottish Trunk Road Infrastructure Project Evaluation (STRIFE) by Transport Scotland sets out the requirements for evaluation which draws on DMRB and STAG. This document was finalised in 2013 and acts as a guide to evaluation for relevant projects. STRIFE states that two programmed evaluations should be carried out on relevant schemes, as follows:

- A one-year after Evaluation (1YA) – prepared one year after opening, this report should “provide Transport Scotland with an early indication (as far as is practicable) that the project is operating as planned and is on-track to achieve its objectives. The 1YA evaluation also provides a Process Evaluation including an assessment of actual vs. forecast project cost, and programme together with reasons for variance”. STRIFE also states that a stand-alone report should be prepared on each individual project. Information gathering should be supported by a site visit and stakeholder interviews.
- A Detailed Evaluation – 3 or 5 years after opening. This second evaluation “considers a project’s impacts, whether it has achieved its objectives and reviews the actual impacts against forecasts and determines the causes of any variances”.

2.2 Evaluation Reporting

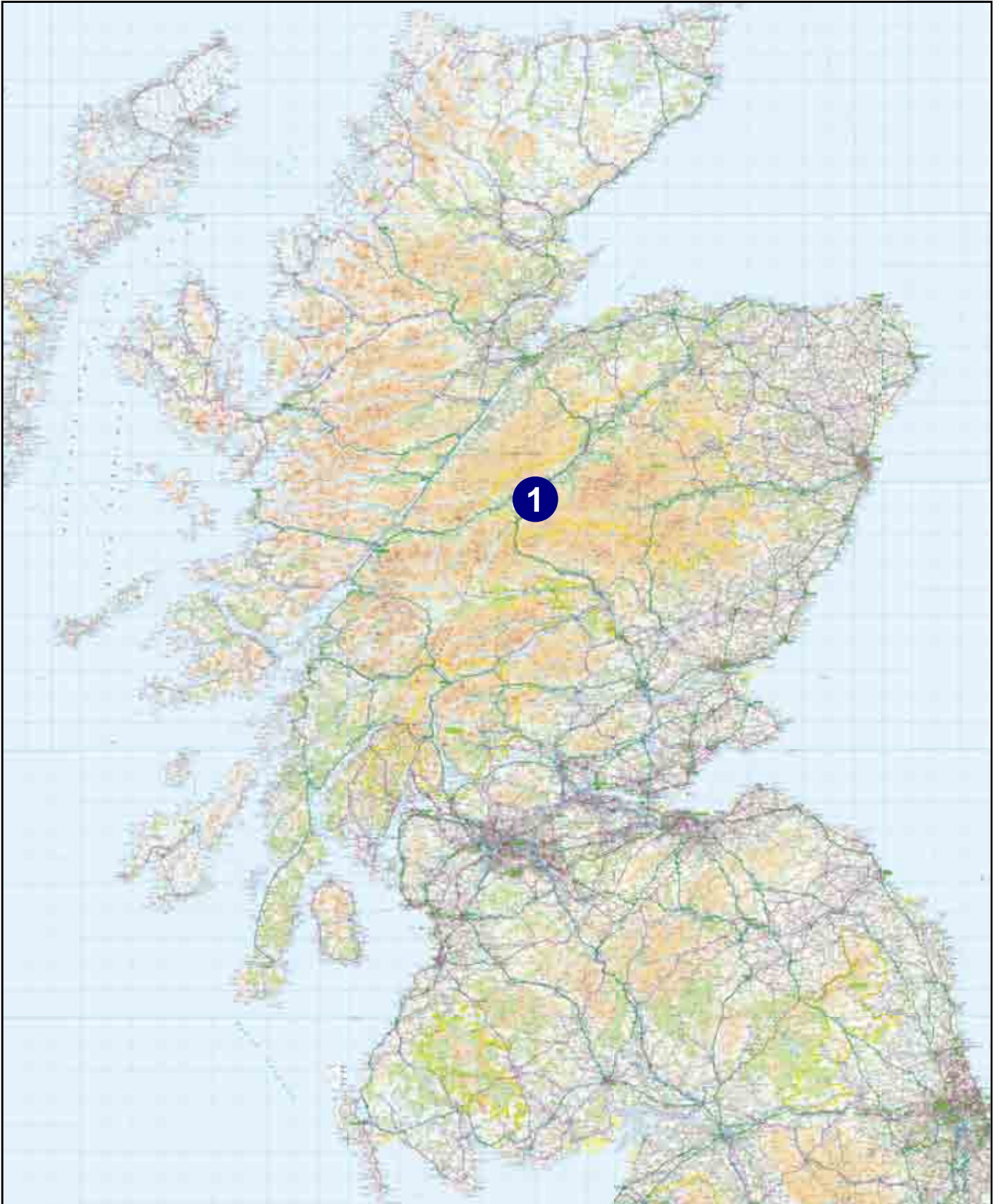
As recommended in STRIFE, this report constitutes a One-Year After (1YA) Evaluation Report. It is a standalone report on the A9(T) Crubenmore Extension Project. This project fits the criteria for evaluation at this stage, as it cost over £5m and was completed and opened to traffic in the 2011/12 financial year.

Table 2.1 Summary Details – A9(T) Crubenmore Extension

Route	Project Name	Standard	Length (km)	Open to Traffic
A9(T)	Crubenmore Extension	D2AP	2.7km	26 Sept 2011

Key: D2AP Dual 2-Lane All Purpose Carriageway

The location of the A9(T) Crubenmore Extension scheme is presented in Figure 2.1.

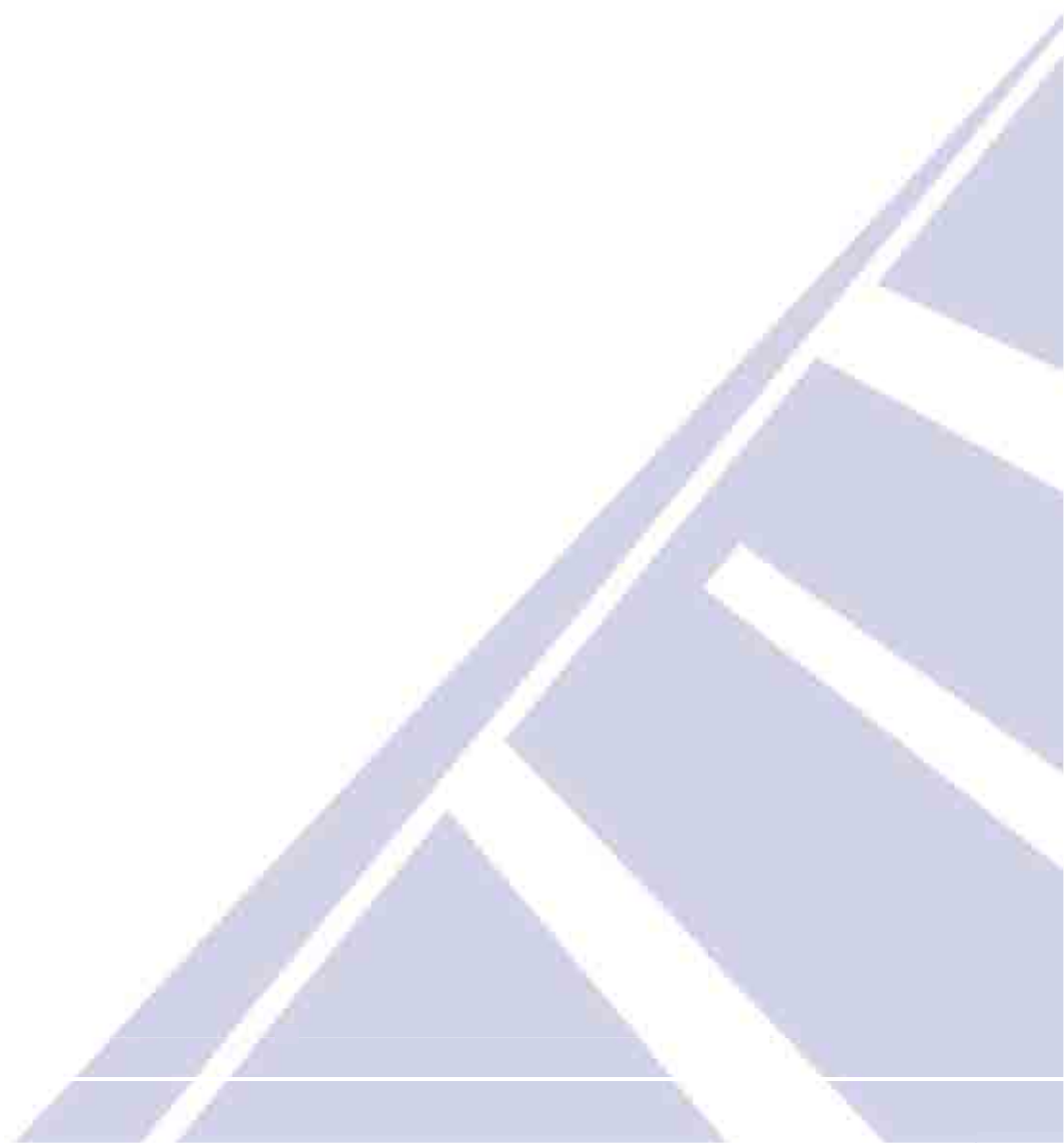


1. A9(T) Crubenmore Extension

Locations of Projects Evaluated
Figure 2.1

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DETAIL OF EVALUATION



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PROJECT EVALUATION

TRANSPORT **SCOTLAND**

3 A9(T) CRUBENMORE EXTENSION

3.1 Introduction

Project Description

The A9(T) between Perth and Inverness is approximately 179 kilometres in length and is located across Perth & Kinross and Highland Council areas. It is a key transportation corridor in the north of Scotland, linking the Highlands and Islands with Central and Southern Scotland.

The A9(T) Crubenmore Extension project involved the construction of approximately 2.7 kilometres of on-line dual carriageway, from the junction of the A9(T) and the U282 'Dalwhinnie to Crubenmore Road' (approximately 5.5 kilometres to the south of Newtonmore) to approximately 0.5 kilometres south of the junction of the A9(T) and the access to Laggan and the Invernahavon Caravan Park.

The project provided an extension to the existing 1.6 kilometres of dual carriageway located directly to the south of the scheme extents to provide approximately 4.3 kilometres in total of continuous dual carriageway. As part of the improvement, the existing cycle track (National Cycle Route NCN7) was retained, maintaining its current alignment with a few localised realignments as required. The general location of the project is shown in Figure 3.1.

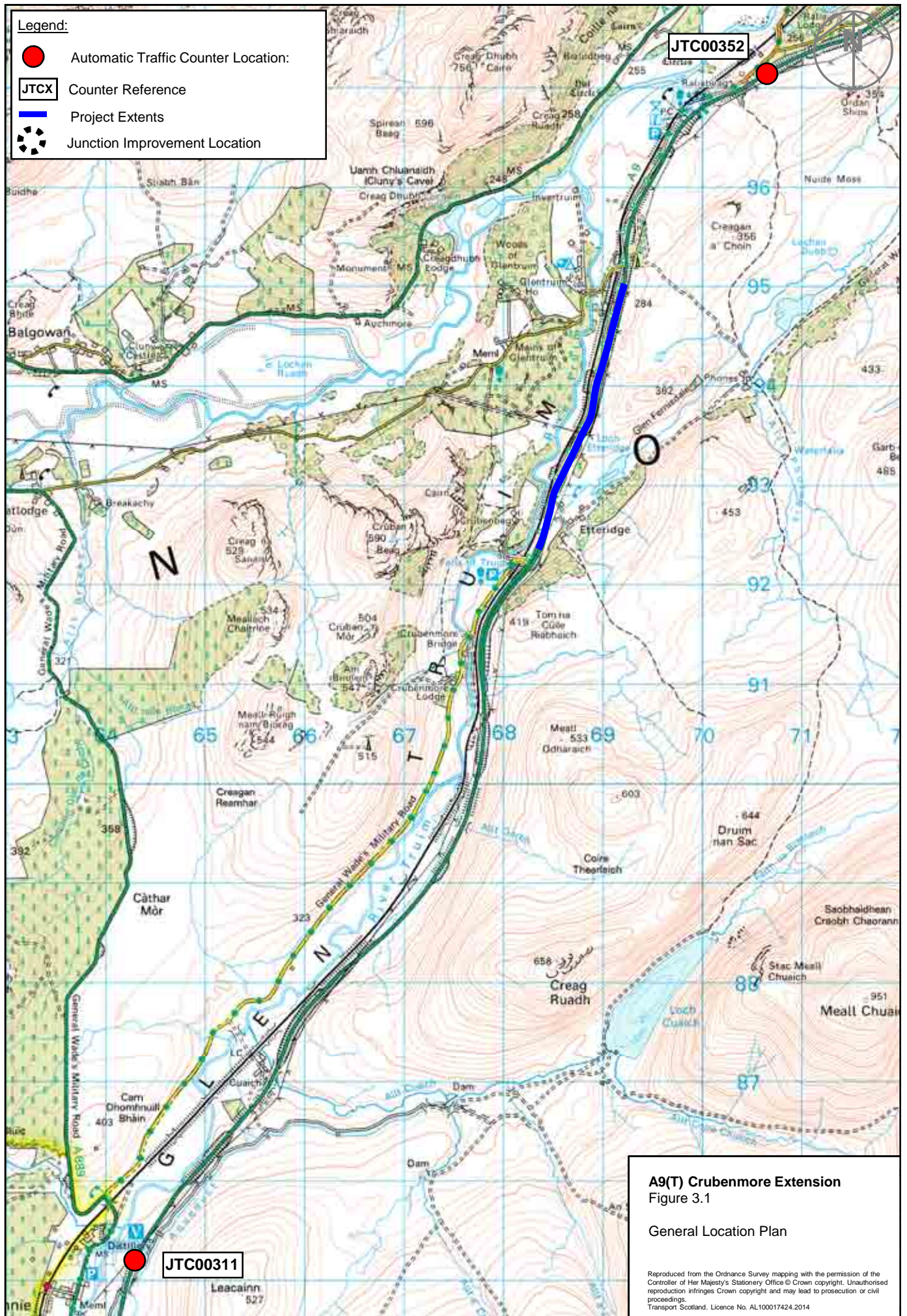
The A9(T) Crubenmore Extension project was officially opened to traffic on 26 September 2011. The final scheme involved departures from Design Standards for dual carriageway schemes, which were approved by the Transport Scotland's Standards Branch.

Rationale and mandate for the scheme

The project was implemented as part of a wider Route Action Plan for the A9(T) developed in 1993, with objectives to improve the safety, comfort and reliability of journey times on the route. The decision to incorporate the A9(T) Crubenmore Dual Carriageway extension scheme into the Trunk Roads Programme was taken following a Strategic Roads Review.

Legend:

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



A9(T) Crubenmore Extension
Figure 3.1

General Location Plan

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SCOTTISH TRUNK ROAD INFRASTRUCTURE

PROJECT EVALUATION

TRANSPORT **SCOTLAND**

In combination with other overtaking projects previously implemented on the A9(T) and the strategic dualling programme of the route currently being progressed by Transport Scotland, the A9(T) Crubenmore Extension scheme was targeted principally to improve the operational performance and safety of the route by reducing driver stress and journey times through the provision of an increased number of overtaking opportunities at this location. Approval to proceed with the scheme was made by Transport Scotland in June 2010.

Project Objectives

The objectives of the A9(T) Crubenmore Extension project were set as follows:

- improve the operational performance and level of service and safety on A9 by reducing the effects of driver stress and journey times;
- improve and increase the number of overtaking opportunities to eradicate the conflicts between long distance users and local/agricultural traffic;
- wherever practicable, incorporate measures for non-motorised users. In particular, cycling proposals shall be designed in accordance with the “Trunk Road Cycling Initiative” which supports the Sustrans Millennium National Cycle Network;
- maintain the asset value of the A9 route;
- mitigate the environmental impact of the new works where possible; and
- achieve good value for money for both taxpayers and transport users.

3.2 Evaluation Methodology

As set out in Section 2.1, this One Year After report presents the results of a One Year Evaluation of the A9(T) Crubenmore Extension project, focusing on:

- The operation of the scheme: how the scheme is operating (in terms of traffic and safety in particular); and
- Objectives: whether the scheme is on-track to achieving its objectives.

Furthermore, a process evaluation has been carried out, which considers how the project was implemented across the elements of project cost, programme and key processes. A commentary on this is included under other criteria (e.g. Road Safety Audit (RSA) process under Safety), the main aspects of process evaluation have been summarised above in the Summary of Impacts (Section 1 of this report).

SCOTTISH TRUNK ROAD INFRASTRUCTURE PROJECT EVALUATION

TRANSPORT **SCOTLAND**

This evaluation was supported by a site visit carried out in November 2013. External stakeholder views were invited from the Highland Council, Cairngorms National Park Authority and the Road Haulage Association (RHA). No comments were received from either the Highland Council or Cairngorms National Park Authority. Feedback was received from the RHA, which is presented within the report.

3.3 The operation of the scheme and process evaluation

Network Traffic

The evaluation is supported by the consideration of pre and post opening comparison of operational indicators, which focuses on network traffic indicators including traffic volumes and travel times, presented in the following section.

Traffic Volumes

The locations of the Automatic Traffic Counters (ATC) within the study area are shown in Figure 3.1.

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 3.1.

Table 3.1: A9(T) Crubenmore Extension – ATC Data

ATC Reference	AADT by Year					
	2007	2008	2009	2010	2011	2012
A9(T) Ralia – North of B9150 Junction (North of the project)						
JTC00352	n/a	n/a	7,660	n/a	Year of Opening	7,461
A9(T) Dalwhinnie (South of the project)						
JTC00311	8,010	7,751	7,487	7,650	Year of Opening	7,582

A comparison between pre and post opening traffic volumes on the A9(T) within the vicinity of the scheme indicates that traffic flows in 2012 were approximately 400 vehicles per day (vpd) lower than 2007 flow levels. Traffic volumes between 2010 and 2012 reduced by approximately 70 vpd (1%) although analysis of the long term trends in annual traffic flows suggest that the volume of traffic on this section of the A9(T) had been falling for a number of years prior to the opening of the project.

SCOTTISH TRUNK ROAD INFRASTRUCTURE PROJECT EVALUATION

TRANSPORT **SCOTLAND**

Given the nature of the A9(T) Crubenmore Extension project, small reductions in traffic levels are not likely to be as a consequence of changes to the carriageway standard and may be as a result of 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 A9(T) Crubenmore Extension project are based on AADT flows from 2012 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 2004 base year traffic flows to derive opening and future year modelled assessment traffic flows.

As AADT flows were not available from the information presented as part of the project's appraisal for either the opening or future modelled assessment years, AADT flows have been derived from the economic assessment of safety impacts element of the appraisal.

While it is acknowledged that the flows within the project's appraisal and the assessment of safety impacts may not be entirely consistent, it is judged that the AADT flows derived from the assessment of safety impacts are a suitable representation of the flows used within the project's appraisal.

Predicted traffic flows for 2012 have been derived by factoring the 2006 base year flows used in the assessment of safety impacts with NRTF central traffic growth factors.

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

Table 3.2: A9(T) Crubenmore Extension – Traffic Analysis Summary

ATC Ref	Actual AADT*	Predicted AADT (2012)	% Difference (Predicted – Actual) / Actual
		Central	Central
A9(T) Dalwhinnie (South of the project)			
JTC00311	7,582	8,410	10.9%

* 2012 flows (first full year of ATC data available)

The comparison between predicted and actual AADT flows in Table 3.2 indicates that the predicted 2012 flow was 10.9% greater than the observed 2012 flow under the central traffic forecast scenario.

SCOTTISH TRUNK ROAD INFRASTRUCTURE PROJECT EVALUATION

TRANSPORT **SCOTLAND**

Whilst this comparison indicates that traffic growth on the A9(T) has fallen significantly short of the assumed NRTF forecasts, it is recognised that there has been a general fall 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.

Overtaking Opportunities

As the opening of this scheme predates the implementation of STRIPE guidance, pre-opening overtaking surveys were not carried out for this scheme. Post-opening overtaking surveys have therefore not been carried out in the absence of a comparable baseline.

However, it is reasonable to assume that, due to the nature of the improvement, (a single 2-lane carriageway upgraded to a dual 2-lane carriageway, providing a 2.7 kilometre extension to the existing section dual carriageway at this location), the number of unambiguous overtaking opportunities will have increased in both directions of travel as a direct result of the project.

Travel Times

Comparison Between Pre and Post Opening Journey Times

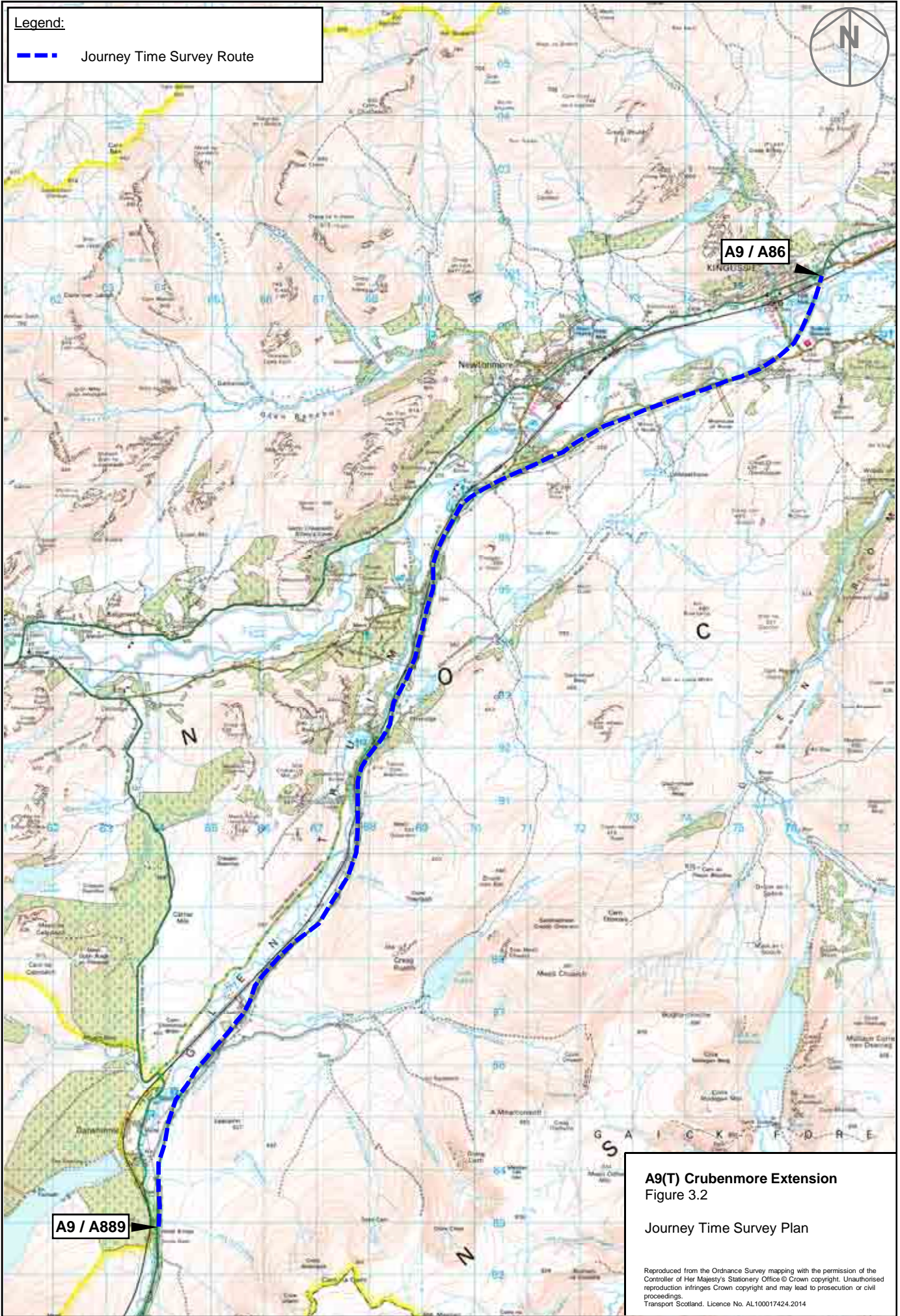
Pre-opening journey time surveys were carried out for the A9(T) Crubenmore Extension project in June and September 2004 to validate the traffic model used in the assessment of the project. Post opening journey time surveys were carried out in February 2014 to provide an indication of the changes in average journey times along the A9(T) between Dalwhinnie and Kingussie.

The extents of the journey time survey route are shown in Figure 3.2.

The average pre and post opening journey times along with the savings in travel time are shown in Table 3.3 below.

Legend:

— — — Journey Time Survey Route



A9 / A86

A9 / A889

A9(T) Crubenmore Extension
Figure 3.2

Journey Time Survey Plan

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Table 3.3: A9(T) Crubenmore Extension – Travel Time Data

Direction	Average Journey Time		Time Savings (mins / secs)	% Saving
	Observed Pre Opening (2004)	Observed Post Opening (2014)		
AM Period				
Northbound	18 mins 16 secs	15 mins 53 secs	2 mins 23 secs	13%
Southbound	18 mins 39 secs	16 mins 32 secs	2 mins 7 secs	11%
Inter Peak				
Northbound	16 mins 26 secs	15 mins 34 secs	52 secs	5%
Southbound	17 mins 27 secs	17 mins 1 sec	26 secs	3%
PM Period				
Northbound	16 mins 24 secs	15 mins 19 secs	1 min 5 secs	7%
Southbound	17 mins 51 secs	17 mins 20 secs	31 secs	3%

Examination of the pre and post opening journey times, presented in Table 3.3, indicates that, between Dalwhinnie and Kingussie, average journey time savings of between 30 seconds and 2 minutes are typical following the opening of the scheme.

Further examination of the pre and post opening journey times indicates that journey time savings appear to be more pronounced during the AM period, with savings of between approximately 2 minutes and 2 minutes 30 seconds (11% and 13%) in the southbound and northbound directions of travel respectively. This can be in part explained by the higher journey times (18mins plus) recorded, pre scheme opening in the morning peak hour. This differs substantially from the other five datasets and is likely to be attributed to higher AM period traffic volumes during this survey.

Journey time savings during the Inter Peak and PM periods appear to be of a lower magnitude when compared to the AM period. Savings of between approximately 30 seconds and 1 minute (3% and 5%) in the southbound and northbound directions of travel respectively were observed during the Inter Peak period with savings of between approximately 30 seconds and 1 minute (3% and 7%) in the southbound and northbound directions of travel respectively observed during the PM period.

SCOTTISH TRUNK ROAD INFRASTRUCTURE PROJECT EVALUATION

TRANSPORT **SCOTLAND**

Comparison Between Predicted and Actual Travel Times

The available predicted 2022 journey time savings have been compared with the journey time savings collected post opening of the scheme in 2014. While there is a significant period (eight years) between the predicted and actual journey times, the predicted flow for 2022 is well below the capacity of the A9(T) at this location, which suggests that journey time savings will remain broadly similar between 2014 and 2022.

The comparison of predicted and actual journey time savings are shown in Table 3.4 below. The actual savings recorded below are directional averages based on the travel time data shown in Table 3.3 previously.

Table 3.4: A9(T) Crubenmore Extension – Predicted vs Actual Travel Time Summary

Direction	Average Daily Journey Time		Comparison (mins / secs)
	Predicted Saving (2022)	Actual Saving (2014)	
Northbound	-	1 min 38 secs	-
Southbound	-	2 mins 43 secs	-
2-Way	25 – 30 seconds	1 min 56 secs	1 min 26 secs - 1 min 31 secs -

The comparison between the available predicted and actual journey time savings presented in Table 3.4 indicates a predicted saving of between 25 and 30 seconds in both directions of travel following the opening of the scheme. This is in comparison to actual savings of approximately 2 minutes in both directions of travel, derived from the observed journey times, indicating that actual savings in journey times are considerably greater than forecast as part of the scheme's assessment.

3.4 Environment

The following section provides a summary of the assessment of environmental mitigation measures proposed for the A9(T) Crubenmore Extension scheme. A fuller report is provided in Appendix B.

SCOTTISH TRUNK ROAD INFRASTRUCTURE **PROJECT EVALUATION**

TRANSPORT **SCOTLAND**

Review of Environmental Mitigation Measures

The environmental mitigation measures originally proposed for the A9(T) Crubenmore Extension project were obtained from the project's ES1. A review of the environmental mitigation measures was carried out in November 2013, as well as a review of the as-built scheme plans. Following this review a site visit was undertaken to establish whether or not the proposed mitigation measures as set out in the Schedule of Committed Mitigation within the ES had been implemented.

The ES for the scheme proposed mitigation measures to address impacts under the following criteria:

- Water Quality, Drainage and Flood Defence
- Biodiversity and Habitats
- Landscape
- Visual Amenity

¹ A9 Crubenmore Dual Carriageway Northern Extension Environmental Statement, Atkins (2007)

SCOTTISH TRUNK ROAD INFRASTRUCTURE PROJECT EVALUATION

TRANSPORT SCOTLAND

Findings

Much of the mitigation which was included within the ES has been implemented on site, with tree planting having been carried out at a number of locations along the northbound carriageway to mitigate against loss of nesting habitat. Overall, the design of the scheme and the implementation of the landscaping and planting mitigation have minimised the visual impact of the scheme and made it in-keeping with the wider landscape character of the area. This was accomplished particularly well along the northbound carriageway and on the embankment towards the cycle path where the creation of a naturalistic transition between verges, cycleway and woodland has been achieved.

The site inspection did however, highlight that the implementation of some measures had not been provided including whether the provision of an impermeable barrier to collect embankment and field drainage was used and whether a native hedgerow, that was to be planted to encourage birds to fly higher than the height of traffic, was provided. A review undertaken during the detailed design stage highlighted that these measures would not have contributed to the scheme integration into the environment. As part of this evaluation a further review has confirmed that their absence was considered not to have had a material detrimental impact on the general integration of the project into its surroundings.

The proposed scheme was not considered to generate any additional traffic, and therefore no issues were identified in relation to noise and vibration, global and local air quality. It was confirmed that a low noise thin surface course was laid.

Environment: Key Findings

The majority of the mitigation which was included within the ES has been implemented on site, is in good condition and is operating as expected.

There were a small number of mitigation measures that could not be confirmed during the site inspection, such as the use of an impermeable barrier to collect embankment and field drainage and the provision of a native hedgerow that was to be planted to encourage birds to fly higher than the height of road traffic. A subsequent review indicated that these mitigation measures were not provided following a review at the detailed design stage, however it is considered that there is no material detrimental impact on the surrounding environment.

The site inspection highlighted that the landscaping and visual amenity measures implemented may not be seen at their best only one year following opening and during the winter period. However, it is expected over time that natural regeneration will allow further assimilation of the scheme into the wider

SCOTTISH TRUNK ROAD INFRASTRUCTURE **PROJECT EVALUATION**

TRANSPORT **SCOTLAND**

landscape and create a more naturalistic transition between the boundaries of the scheme and the surrounding environment.

Key recommendations

Transport Scotland continues to robustly consider ES commitments to ensure they remain appropriate to the project.

SCOTTISH TRUNK ROAD INFRASTRUCTURE PROJECT EVALUATION

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3.5 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) Crubenmore Extension project 3 years before and 1 year after project completion are shown in Figure 3.3a and Figure 3.3b.

A summary of the personal injury accident data is shown in Table 3.5.

Table 3.5: A9(T) Crubenmore Extension – Accident Data Summary

Period	Fatal	Serious	Slight	Total Accidents
3 Years Before				
A9(T)	0	0	2	2
1 Year After				
A9(T)	0	0	1	1

As can be seen from Table 3.5, one personal injury accident (one slight) occurred in the 1 year period following the opening of the project in comparison to two personal injury accidents (two slight) in the 3 years before opening.

Road Safety Audits

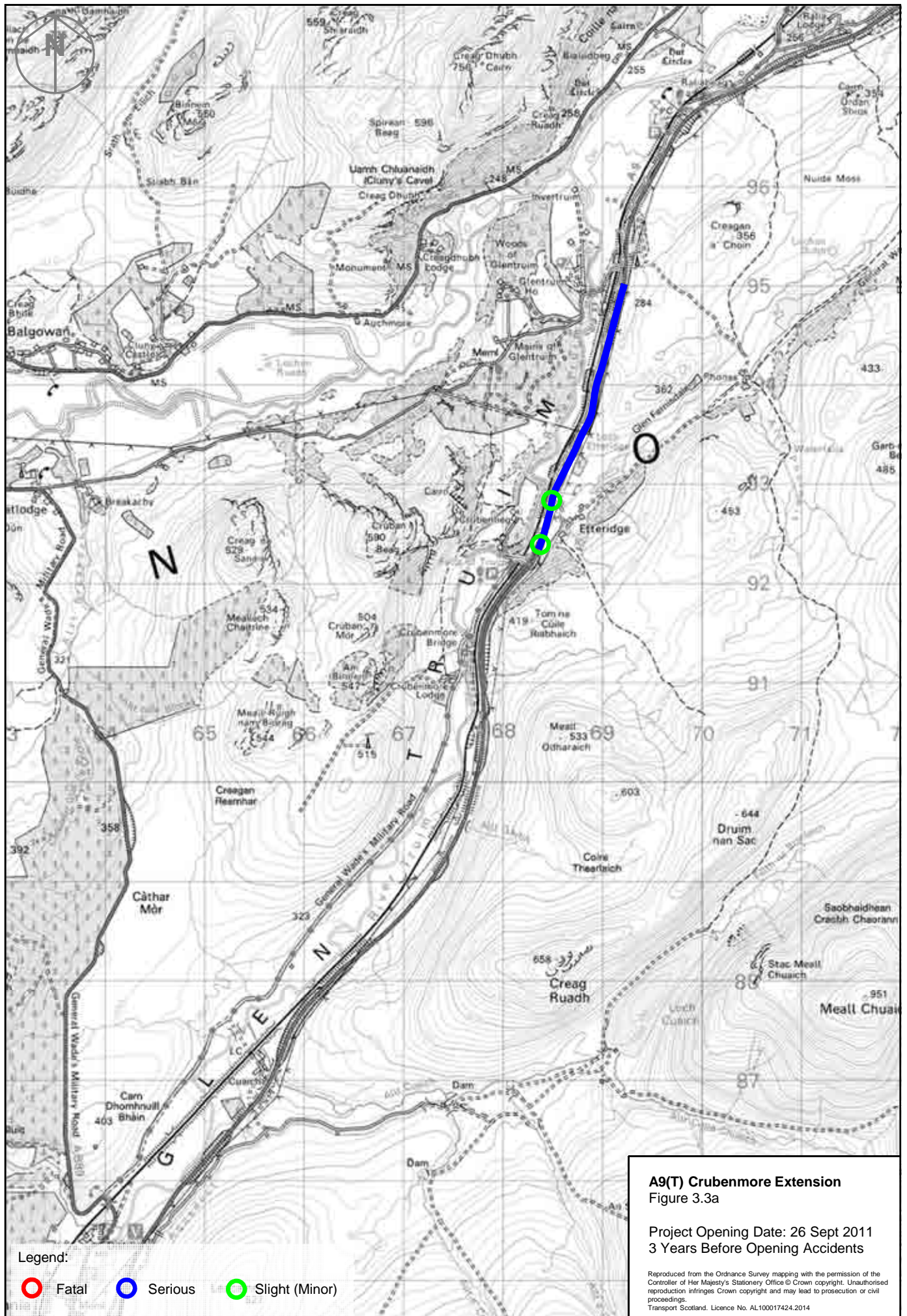
The RSA process has been followed, with Stage 1, 2, 3 and 4 Audits carried out. The Stage 4 Audit, undertaken in December 2012, confirmed that one slight accident had occurred within the vicinity of the scheme in the 1 year period following the opening of the project. However no conclusions can be drawn that would suggest road safety deficiencies in the scheme as the accident involved a northbound vehicle skidding and striking the central reserve in wet conditions. The Stage 4 RSA recommended that accidents within the vicinity of the scheme continue to be monitored.

Safety: Key Findings

An assessment of the 1 year post opening personal injury accidents and the findings from the Stage 4 RSA suggests that the A9(T) Crubenmore Extension project is operating safely.

Recommendations

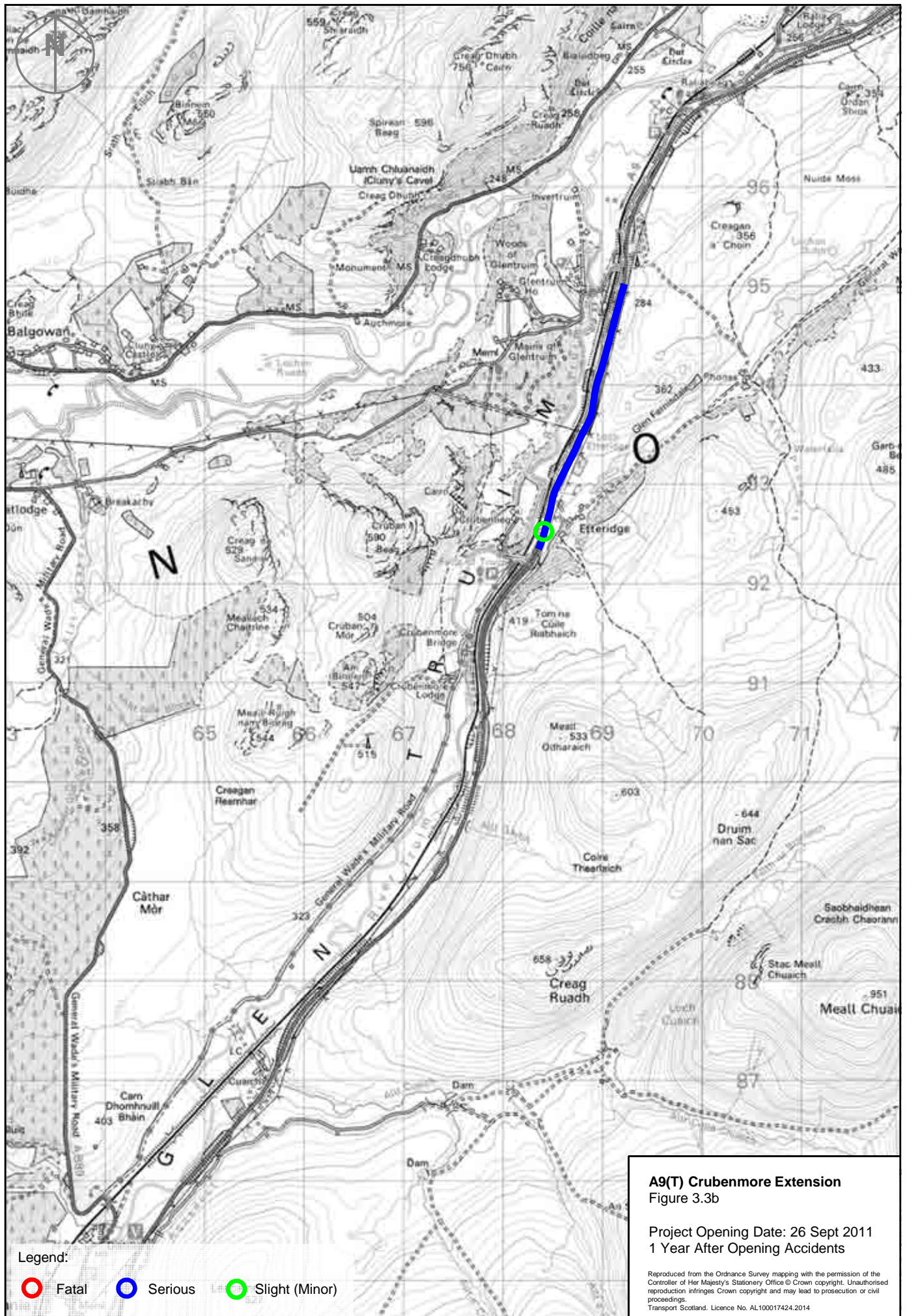
The Stage 4 RSA recommended that accidents within the vicinity of the scheme continue to be monitored.



A9(T) Crubenmore Extension
Figure 3.3a

Project Opening Date: 26 Sept 2011
3 Years Before Opening Accidents

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Legend:

- Fatal
- Serious
- Slight (Minor)

A9(T) Crubenmore Extension
Figure 3.3b

Project Opening Date: 26 Sept 2011
1 Year After Opening Accidents

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SCOTTISH TRUNK ROAD INFRASTRUCTURE PROJECT EVALUATION

TRANSPORT SCOTLAND

3.6 Economy

Transport Economic Efficiency

The comparisons between predicted and actual traffic flows and travel times, presented in section 3.3, 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 indicates that the predicted 2012 flows were up to 10.9% greater than the observed 2012 flows on the A9(T) within the vicinity of Crubenmore. This overestimation may in part be due to the prediction being undertaken before the economic downturn.

Comparison Between Predicted and Actual Travel Times

The comparison of predicted and actual travel times indicates that the predicted journey time savings are approximately 1 minute 30 seconds less than the observed average journey time savings.

Stakeholder feedback

The RHA offered feedback on the scheme for the purposes of this Evaluation report. The RHA stated that the A9(T) Crubenmore Extension scheme had indeed helped to reduce driver frustration by enabling safe overtaking, which is in-line with the objectives set for the scheme.

Economy: Key Findings

While actual AADT flows are likely to be lower than predicted, a difference between predicted and actual journey time savings of this magnitude suggests that the economic benefits of the project may have been underestimated due to external factors that could not have readily been foreseen at the time of assessment.

3.7 Accessibility & Social Inclusion

Community Accessibility

As part of the improvement, the existing cycle track (National Cycle Route NCN7) was retained, maintaining its current alignment with a few localised realignments as required along the length of the scheme.

SCOTTISH TRUNK ROAD INFRASTRUCTURE

PROJECT EVALUATION

TRANSPORT **SCOTLAND**

A Stage 3 Cycling Audit was carried out for this scheme in November 2011, reporting on the facilities for pedestrians and cyclists. The Cycling Audit records that the horizontal alignment of the route is generally without problems and sightlines are appropriate, however, there are two sections of the route where the vertical alignment is relatively steep however the Design Team have indicated the design is to standard where possible. Gradients of this nature can be expected by users given the rural location and long distance nature of the route.

The audit also records that the cross section of the route narrows at two locations at tie-ins to the old A9 carriageway which could result in issues for users of the route in addition to potential drainage issues such as localised ponding that requires to be monitored.

The audit highlighted that an issue with limiting the number of equestrian users who previously crossed the A9 from the cycle path to connect with the existing section of General Wade's Military Road. This manoeuvre had not been highlighted during the scheme's development, consultations and Statutory Process.

Through consultation with concerned parties, it has been agreed that an underpass will be provided between the upgraded U2837 side road junction and the upgraded Etteridge Estate Access. Transport Scotland is now developing proposals for this underpass as part of the wider A9 Dualling strategy with respect to accessibility and non-motorised Users.

Local disabled and visually impaired groups were not consulted as given the remote & rural nature of the site they were not considered to be 'interested user groups'. A DDA Audit was not undertaken for these reasons.

The Audit concluded that the cycling provision included as part of the project was satisfactory. During the environmental mitigation measures review, it was observed that no cyclists and / or pedestrians were present on site. No evidence has been found to confirm whether there has been a change in the levels of use of this route by active travel users.

Given the rural nature of the project, it is unlikely that significant accessibility improvements will have been felt by local active travel users and it is difficult to conclude whether any wider accessibility impacts have resulted from this active travel element of the project.

Accessibility & Social Inclusion: Key Findings

The existing cycle track (National Cycle Route NCN7) was retained as part of the improvement, maintaining its current alignment with a few localised realignments as required along its length, however, observations made during

SCOTTISH TRUNK ROAD INFRASTRUCTURE PROJECT EVALUATION

TRANSPORT **SCOTLAND**

a site visit indicated that the facilities were not regularly used. Given the rural nature of the project, it is difficult to conclude whether local accessibility for pedestrians and cyclists has been enhanced as a result of the project.

Recommendations

The Stage 3 Cycle Audit recommended that the facilities continue to be monitored to confirm that no drainage issues exist, any unfavourable user comments relating to the topography of the route be reviewed, minor remedial works be undertaken to better define the edge of the route and provision of appropriate signage for different user groups be considered, if required.

3.8 Cost to Government

Investment Costs

Comparison Between Predicted and Out-turn Costs

The outturn and predicted project costs are shown in Table 3.6.

Table 3.6: A9(T) Crubenmore Extension – Project Cost Summary

	Out-turn Cost		Predicted Cost		Difference (Out-turn - Pred)
	@ June 2013	Mid 02 Prices in 2002 at 3.5% Discount	Jun 10 Prices incl 15% OB	Prices in 2002 at 3.5% Discount	Mid 02 Prices in 2002 at 3.5% Discount
Total	£13,355,208	£7,584,279	£13,707,000	£8,203,000	£618,721 (8%)

Cost to Government: Key Findings

The out-turn cost of the A9(T) Crubenmore Extension project is approximately £0.62m (8%) lower than was predicted at the time of assessment.

3.9 Value for Money

Initial Indications

The economic appraisal results for the A9(T) Crubenmore Extension project predicted a Net Present Value (NPV) of £3.58m and Benefit to Cost Ratio (BCR) of 1.54 under the central traffic forecast scenario.

Based on the comparisons presented in sections 3.3 and 3.8, which suggest that the benefits may have been underestimated and indicate that the out-turn cost is lower than predicted, the NPV and BCR of the project may be greater than predicted.

SCOTTISH TRUNK ROAD INFRASTRUCTURE PROJECT EVALUATION

TRANSPORT **SCOTLAND**

Value for Money: Key Findings

Lower outturn costs and lower traffic volumes than forecast mean that the project's original BCR of 1.54 is unlikely to have changed significantly, meaning the project still offers value for money. This should however be reviewed after three years or more to determine whether the scheme continues to offer value for money in the longer term.

3.10 Progress Towards Achieving Objectives

As specific indicators to measure the performance of the A9(T) Crubenmore Extension 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 A9(T) Crubenmore Extension project is progressing towards achieving its objectives, is presented in Table 3.7.

SCOTTISH TRUNK ROAD INFRASTRUCTURE **PROJECT EVALUATION**

TRANSPORT **SCOTLAND**

Table 3.7: A9(T) Crubenmore Extension – Progress Towards Achieving Objectives

Objective	Commentary	Progress
<p>Improve the operational performance and level of service and safety on A9 by reducing the effects of driver stress and journey times</p>	<p>The provision of the dual 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 where provision for overtaking has been improved and for which journey time data is available, the provision of the dual 2-lane carriageway is judged to have a positive impact on journey times.</p> <p>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) Crubenmore Extension project is operating safely.</p>	<p>+ve</p>
<p>Improve and increase the number of overtaking opportunities to eradicate the conflicts between long distance users and local/agricultural traffic</p>	<p>While pre and post opening overtaking surveys are not available, the upgrade from single 2-lane carriageway to dual 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 the Road Haulage Association supports this assertion.</p>	<p>+ve</p>
<p>Wherever practicable, incorporate measures for non-motorised users. In particular, cycling proposals shall be designed in accordance with the “Trunk Road Cycling Initiative” which supports the Sustrans Millennium National Cycle Network</p>	<p>As part of the project, the existing cycle track (National Cycle Route NCN7) was retained, maintaining its current alignment with a few localised realignments as required along the length of the scheme.</p> <p>Cycling proposals were designed in accordance with the ‘Trunk Road Cycling Initiative’. A Stage 3 Cycle Audit was carried out for the project, which discussed cycling provisions and made a number of recommendations.</p>	<p>+ve</p>
<p>Maintain the asset value of the A9 route</p>	<p>Given the nature of the A9(T) Crubenmore Extension project,</p>	<p>+ve</p>

SCOTTISH TRUNK ROAD INFRASTRUCTURE **PROJECT EVALUATION**

TRANSPORT **SCOTLAND**

Objective	Commentary	Progress
	<p>which involved replacing 2.7 kilometres of existing single carriageway with 2.7 kilometres of dual 2-lane carriageway, the asset value of the A9(T) between the project tie-in points is likely to have increased thus maintaining the value of the route.</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 measures could not be confirmed during the site inspection and the condition of others may not have been as expected, these issues are not considered to have had a material detrimental impact on the general integration of the project into its surroundings.</p> <p>It is likely, given the lower traffic volumes and the shorter journey times over the scheme's length, that this will have a beneficial impact on vehicle emissions.</p>	<p>+ve</p>
<p>Achieve good value for money for both taxpayers and transport users</p>	<p>The A9(T) Crubenmore Dual Carriageway Extension project forms part of a series of improvements along the A9(T) corridor that can be expected to provide benefits to transport users and help encourage economic development within the north of Scotland and beyond.</p> <p>The project's NPV and BCR is likely to be similar to that at the time of assessment due to the lower outturn scheme costs being cancelled out by lower actual traffic volumes.</p>	<p>+ve</p>

Key: +ve Initial indication(s) that objective may be achieved
 = Progress towards achievement of objective cannot be confirmed
 O Initial indication(s) that objective may not be achieved

Appendix A: Methodology and Data Sources

A METHODOLOGY AND DATA SOURCES

A.1 OVERVIEW

The project presented in this report has 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 evaluation focuses on impacts relating to the project's objectives, evaluations against all of the above criteria may not be undertaken for all projects. The evaluation is supported by the consideration of network traffic indicators, including traffic volumes and travel times, as presented in the following section.

A.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.

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.

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 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 Road Haulage Association.

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.

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 Road Haulage Association

A.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 project as no significant impacts on noise and air quality were expected.

A.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 the project, 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.

A.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.

A.6 INTEGRATION

Commentary on Transport Integration and Policy Integration is provided for projects that have specific objectives relating to the Integration criterion. In this instance, no scheme objectives related to integration and this criteria has therefore not been assessed.

A.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.

A.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.

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.

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.

A.9 VALUE FOR MONEY

Initial Indications

Based on the evaluation of economic benefits and project costs outlined in sections 3.6 and 3.8 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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A.10 ACHIEVEMENT OF OBJECTIVES

Initial Indications

The evaluation includes an indication of how the project is progressing towards achieving its 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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Appendix B: Environment

Environment

This section provides details of the 1-year after evaluation undertaken for the Environment criterion in the Scottish Trunk Road Infrastructure Project Evaluation (STRIFE). The 1-year after evaluation includes a 'high level' assessment of the environmental impacts of the project (where possible), a review of whether the environmental mitigation measures proposed in the project's Environmental Statement (ES) have been implemented (commenting on their success where possible) and a check of whether specific requirements of the appraisal process have been met.

The environmental mitigation measures originally proposed for A9 Crubenmore were obtained from the project's ES. A review of the environmental mitigation measures was carried out in November 2013. Following this review a site visit was undertaken, on 13 November 2013, to establish whether or not the proposed mitigation measures as set out in the Schedule of Committed Mitigation within the ES had been implemented.

Noise and Vibration

The ES identified that a thin wearing course (low noise surface) was assumed for the project to reduce noise impacts for locally sensitive receptors. From the site visit undertaken it is unclear whether low noise surfacing has been utilised in the construction of the scheme, however further investigation confirmed that a low noise thin surface course was used.

Noise modelling carried out to inform the ES determined there would be a negligible change to the level of traffic noise following completion of the scheme. Therefore, no noise monitoring has been undertaken as part of this review to confirm whether noise levels experienced by any affected receptors on this section of A9 are higher or lower than those experienced prior to construction.

Similarly the ES concluded there would no adverse impacts due to groundbourne or airborne vibration at any of the receptors located within the project area. These criteria have therefore not been considered in this review.



Figure 1 Northbound carriageway looking South

Global and Local Air Quality

The ES determined that traffic flow or proportion of HGVs is not expected to change and concluded there would be negligible change in the concentration of pollutants to this section of A9 following completion of the scheme.

Given this, no mitigation measures to reduce the impact upon global or local air quality were identified outside the construction period.

Air quality was not assessed as part of this review.

Water Quality, Drainage and Flood Defence

There are a number of watercourses in and around the project area, including River Truim, part of a Special Area of Conservation (SAC) and Loch Etteridge, a designated Site of Special Scientific Interest (SSSI). Assessment undertaken as part of the ES determined that mitigation required for the operation of the scheme was to include the provision of filter drains running along the length of each carriageway. To improve the performance of the filter drains the new surface was to be built without kerbs to allow sheet flow from the carriageway.

Both these measures have been put in place as required. At the time of this review some sections of the filter drain were not in an acceptable condition. Along the northbound carriageway there were areas of weed growth (Figure 2). The ongoing maintenance of the filter drain is the responsibility of the current Trunk Road Operating Company and not the Contractor. There was also evidence of discarded road surface material in the filter drain which may be either a construction issue or maintenance issue (Figure 3). There were gaps in the filter drain along the southbound carriageway (Figure 4), and a comparison of the detailed design and as-built drawings would be required to determine whether this gap was intentional and, if it was not intentional, the implications should be considered of the potential impacts on nearby watercourses and the SAC if there is connectivity or in the effectiveness of the road drainage.



Figure 2 Weed growth in filter drain along Northbound Carriageway



Figure 3 Discarded road surface material



Figure 4 Gap in filter drain along Southbound Carriageway

Catch pits and oil interceptors have been included at various locations as required.

An impermeable barrier to collect embankment and field drainage, to reduce drainage from a raised bog and prevent road run-off reaching the bog was also included in the mitigation measures required. Following a review at the detailed design stage, it was recognised that implementation of this would have impacts (flooding/ground saturation) to adjacent land and the impermeable barrier was therefore not constructed. The existing drainage regime is not considered to be adversely affected by the scheme design and it has been confirmed that road run-off will not impact on the area of bog in the opinion of the design team

Geology

Assessments undertaken as part of the ES determined that no mitigation measures were necessary for the operation of the scheme. No issues relating to geology were identified during the environmental mitigation measures review.

Biodiversity and Habitats

To mitigate against loss of nesting habitat in the long term, the ES contained a commitment to tree planting, woodland translocation and enhancement of adjacent habitat.

Tree planting has been carried out a number of locations along the northbound carriageway as shown in Figures 5 and 6. This has been undertaken at a suitable distance from the road verge. The source and type of trees was not confirmed during this review.



Figure 5 Tree Planting along Northbound Carriageway



Figure 6 Tree planting along northbound carriageway embankment

No tree planting was evidenced along the southbound carriageway, as per the ES, which advised against planting trees opposite existing woodland. This helps to prevent any future wildlife crossing opportunities being created.

The site visit identified that some mature trees were within the project area, indicating that they had been retained as per the proposed mitigation. However, it was not possible to determine whether mature trees had been removed (if any) without sight of any pre-construction tree survey reports or the scheme's tree protection plans to enable a comparison of pre and post construction.

It is understood that a mycology specialist (Liz Holden of Mar Estates) was engaged in preparing the contract specification for translocation and mitigation for fungi, and that she also oversaw and monitored translocation activities on site during construction. The client has confirmed that she has been monitoring annually the success of the translocation activity for up to three years post construction. The monitoring programme concludes in 2014. During the site visit, fungi was present in places on the verge along the northbound carriageway.

The ES included a commitment for the contractor to collect and remove all construction litter. A degree of litter and debris was observed along both carriageways. A certain amount of this will most likely be windblown or left by road users. However, there was evidence of construction debris including discarded plastic road studs and a metal traffic sign frame. The Contractor has been made aware of this issue.

The road operator is to monitor the number and type of animal casualties in the first three to five years of operation. Four instances of road kill were identified during the site visit, one bird on the northbound carriageway, two birds on the northbound verge and a deer located on the central reserve. It is not known when these incidents of road kill had occurred, but it could be possible to compare pre-construction levels with post-construction levels if the road operator is collating comparable data for this particular section. See the landscape section below for information about the decision not to install the hedgerow that had been recommended in the ES to help minimise bird loss at this location.

Landscape & Visual Amenity

Mitigation measures recommended within the ES for landscape and visual effects include planting of additional vegetation adjacent to the A9 to replace areas of woodland removed during construction. As detailed in the section above, this measure has been implemented. As this review was carried out only one year on and during the winter period, much of these mitigation measures have not yet had time to mature.



Figure 7 Grass along the northbound carriageway

The ES stated that verges, embankments and central reserve were to be sown with acid grassland mix. Whilst the verges and embankments have been seeded and grass can now be seen growing along both carriageways (Figure 7) the central reservation has been filled with stone chips (Figure 8). It is understood that the design change in relation to the stone chip was because grass central reservations have considerably greater maintenance requirements, such as cutting and weeding, than those which are stone chipped. These activities would require lane closures to allow them to be carried out safely. By using stone chips, the maintenance requirements are significantly reduced, along with the risks to road workers when working in the central reserve. Red stone chips have been used at strategic locations to emphasise the presence of the central reserve.



Figure 8 Central reservation filled with stone chips

There are some areas, particularly along the southbound carriageway where the ground is covered in small rock. It is not clear whether this is discarded construction material but it creates patchy areas of grass which detract from the overall look of the landscape (Figure 9). It is expected that over time, the appearance of the verge will improve as the grass becomes more established.



Figure 9 Rocky area preventing grass growth

According to the ES, a native hedgerow was to be planted to the south east of A9 to act as a physical barrier which would encourage birds to fly higher than most vehicles. During the detailed design stage, further consideration was given to this mitigation measure which concluded that it would not be in keeping with the landscape character at this location. It is understood that it was also considered to have minimal benefit to raising the height of low flying birds given its location at the toe of the adjacent trunk road embankment would be approximately two to three metres below road level.

Further mitigation required re-use of excavated topsoil to be placed in niches and ledges on the newly exposed rock face. This would allow naturally occurring seed within the soil to colonise the rock face over time. During the site visit it was not obvious that this had been completed. There were signs of grass growing on the rock, as shown in Figure 10, which indicates the presence of soil in the crevices but it cannot be established whether this is windblown or soil that has been deliberately used here.



Figure 10 Evidence of grass growing on newly exposed rock face

Along the southbound carriageway the newly exposed rock face, in its current state, does not sit particularly well within the surrounding landscape (Figure 11). However, cutting into rock will inevitably create a more uncharacteristic visual aspect, which should soften over time as vegetation takes root and the rock weathers.



Figure 11 Newly exposed rock face

Overall the scheme works well within the wider landscape of the area, particularly along the northbound carriageway and down the embankment towards the cycle path (Figure 12). This area has successfully regenerated creating a naturalistic transition between verges, cycleway and woodland.



Figure 12 Regeneration of area adjacent to cycle path

Agriculture and Soils

Assessments undertaken as part of the ES determined that no mitigation measures were necessary for the operation of the scheme. No issues relating to agriculture and soils were identified during the environmental mitigation measures review.

Cultural Heritage

Assessments undertaken as part of the ES determined that no mitigation measures were necessary for the operation of the scheme. No issues relating to cultural heritage were identified during the environmental mitigation measures review.

Physical Fitness

Assessments undertaken as part of the ES determined that no mitigation measures were necessary for the operation of the scheme. The cycle path, part of National Cycle Route 7 (NCN7), has been retained and is currently in an acceptable condition, as shown in Figure 13. No other issues relating to physical fitness were identified during the environmental mitigation measures review.



Figure 13 Existing cycle path retained as part of scheme

Land Use

Assessments undertaken as part of the ES determined that no mitigation measures were necessary for the operation of the scheme. The scheme area was mainly within the pre-existing A9 footprint, with only minimal additional land take, the impact of which was assessed to be neutral. No issues relating to land use were identified during the environmental mitigation measures review.

Vehicle Travellers

Assessments undertaken as part of the ES determined that no mitigation measures were necessary for the operation of the scheme. Mitigation undertaken during construction and reported in sections above include planting of vegetation, native trees and use of excavated topsoil on the exposed rock cutting. For vehicle travellers these measures, together with re-profiling of embankment cuttings, should improve 'the view from the road'. This is expected to create a slight beneficial impact given the increase in distance and availability of views. No other issues relating to land use were identified during the environmental mitigation measures review.

Environment: Conclusion

Most of the mitigation measures included within the ES that are relevant during operation have been implemented and were seen to be in reasonable condition during the review. Two aspects that could not be confirmed during the site visit are understood not to have been implemented due to scheme changes at the detailed design stage: the impermeable barrier to collect embankment and field drainage, and the native hedgerow that was to be planted to encourage birds to fly higher than the height of traffic. These changes were considered by the design team not to have had a detrimental impact on the environment, or the general integration of the project into its surroundings.

The timing of the site visit, only one year on and during the winter period, does not necessarily allow for most of the landscaping and visual amenity measures to be observed at their best. It is expected over time that natural regeneration will allow further assimilation into the wider landscape and create a more naturalistic transition between the boundaries of the scheme and the surrounding environment.

Further copies of this document are available, on request, in audio and large print formats and in community languages (Urdu; Bengali; Gaelic; Hindi; Punjabi; Cantonese; Arabic; Polish).

اس دستاویز کی مزید کاپیاں آڈیو کیسیٹ پر اور بڑے حروف کی چھپائی میں اور کمیونٹی کی زبانوں میں طلب کیے جانے پر دستیاب ہیں، برائے مہربانی اس پتہ پر رابطہ کریں:

এই ডকুমেন্ট-এর (দলিল) অতিরিক্ত কপি, অডিও এবং বড়ো ছাপার আকারে এবং সম্প্রদায়িক ভাষায় অনুরোধের মাধ্যমে পাওয়া যাবে, অনুগ্রহ করে যোগাযোগ করুন:

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

इस दस्तावेज़/कागजात की और प्रतियाँ, माँगे जाने पर, ऑडियो टैप पर और बड़े अक्षरों में तथा कम्प्यूनिटी भाषाओं में मिल सकती हैं, कृपया संपर्क करें:

ਇਸ ਦਸਤਾਵੇਜ਼/ਕਾਗਜ਼ਾਤ ਦੀਆਂ ਹੋਰ ਕਾਪੀਆਂ, ਮੰਗੇ ਜਾਣ 'ਤੇ, ਔਡੀਓ ਟੇਪ ਉੱਪਰ ਅਤੇ ਵੱਡੇ ਅੱਖਰਾਂ ਵਿਚ ਅਤੇ ਕੰਮਿਊਨਿਟੀ ਭਾਸ਼ਾਵਾਂ ਦੇ ਵਿਚ ਮਿਲ ਸਕਦੀਆਂ ਹਨ, ਕ੍ਰਿਪਾ ਕਰਕੇ ਸੰਪਰਕ ਕਰੋ:

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