



TRANSPORT SCOTLAND
SCOTTISH TRUNK ROAD INFRASTRUCTURE
PROJECT EVALUATION

1YA Evaluation Report for A77(T) Park End to Bennane

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1YA Evaluation Report for A77(T) Park End to Bennane

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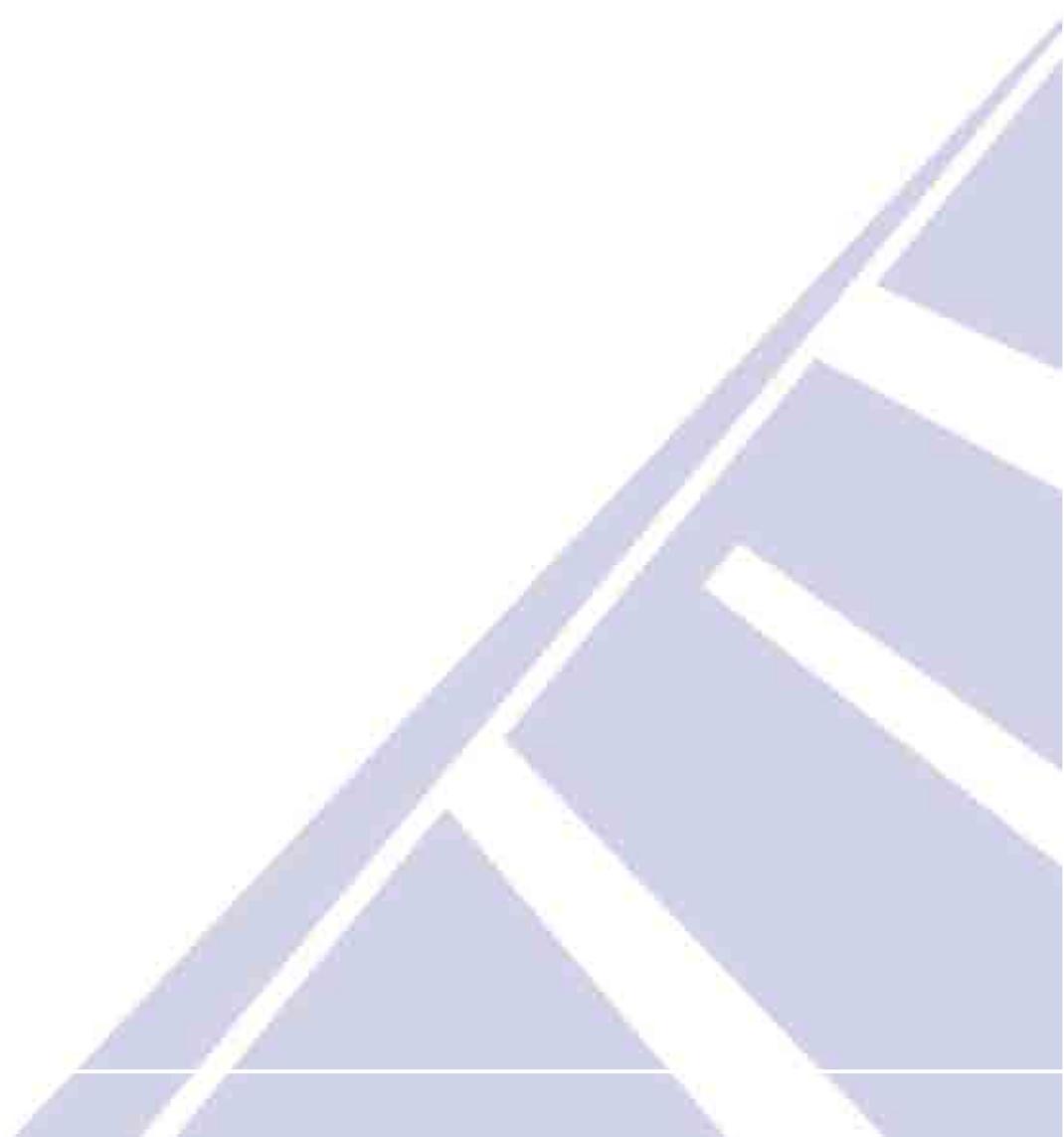
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GLOSSARY

The following abbreviations have been used in this report:

1YA	One Year After Opening (Evaluation)
AADT	Annual Average Daily Traffic
ATC	Automatic Traffic Counter
BCR	Benefit to Cost Ratio
DMRB	Design Manual for Roads and Bridges
NPV	Net Present Value
NRTF	National Road Traffic Forecasts
RSA	Road Safety Audit
STAG	Scottish Transport Appraisal Guidance
WS2	Wide Single 2-Lane Carriageway
WS2+1	Wide Single 2+1 Lane Carriageway

INTRODUCTION



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1 SUMMARY OF IMPACTS

This section provides a short summary of the key elements contained within this One Year After Opening Evaluation report of the A77(T) Park End to Bennane scheme.

1.1 Operational Indicators – How is the scheme operating?

Traffic flows on the A77(T) in the vicinity of the scheme are broadly consistent with those forecast and assessed within the business case for the scheme. Post-opening surveys of speed and overtaking conditions suggest the scheme is operating as expected. Fewer platoons of vehicles are exiting the survey site than entering due to the improved overtaking opportunities.

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 but was delivered 3 months behind programme in July 2011 due to delays associated with adverse winter weather experienced during construction.

A Stage 4 RSA was carried out and confirmed that no accidents have occurred in the period 1 year after opening.

No Cycle or Disability Discrimination Act (DDA) Audit was carried out as no relevant user groups were identified in this rural scheme.

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

The scheme's objectives, in relation to the operation of the scheme, focussed on the improvement and increase in the number of overtaking opportunities and improving the level of service and safety by reducing the effects of driver stress and journey times on this section of the A77(T).

The nature of the scheme (overtaking lanes provided in both northbound and southbound directions) will provide enhanced overtaking opportunities. Journey time data is not available for the scheme, but taking vehicle speed data as a proxy suggests journey times are consistent with average speeds to be expected on this route.

The scheme is operating safely in its first year of operation, with no reported accidents.

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

In conjunction with the Route Action Plan for the A77(T) corridor, the Park End to Bennane project forms part of a series of improvements that can be expected to provide benefits to transport users and help encourage economic development within south west Scotland and beyond. In particular, the scheme helps to promote reliable access to key ferry terminals in the region.

The Net Present Value (NPV) and Benefit to Cost Ratio (BCR) for this scheme may be less than those predicted at the time of assessment as datasets used in the assessment (such as observed overtaking levels) did not represent typical route conditions due to the presence of roadworks on the A77(T) during the data collection phase of the scheme's appraisal.

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

- A One-year After Opening 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.
- 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”.

STRIPE reflects the evaluation requirements of the Design Manual for Roads and Bridges (DMRB), Volume 5, SH 1/97 ‘Traffic and Economic Assessment of Road Schemes in Scotland’, which 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.

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STRIPE is consistent with 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.

2.2 Evaluation Reporting

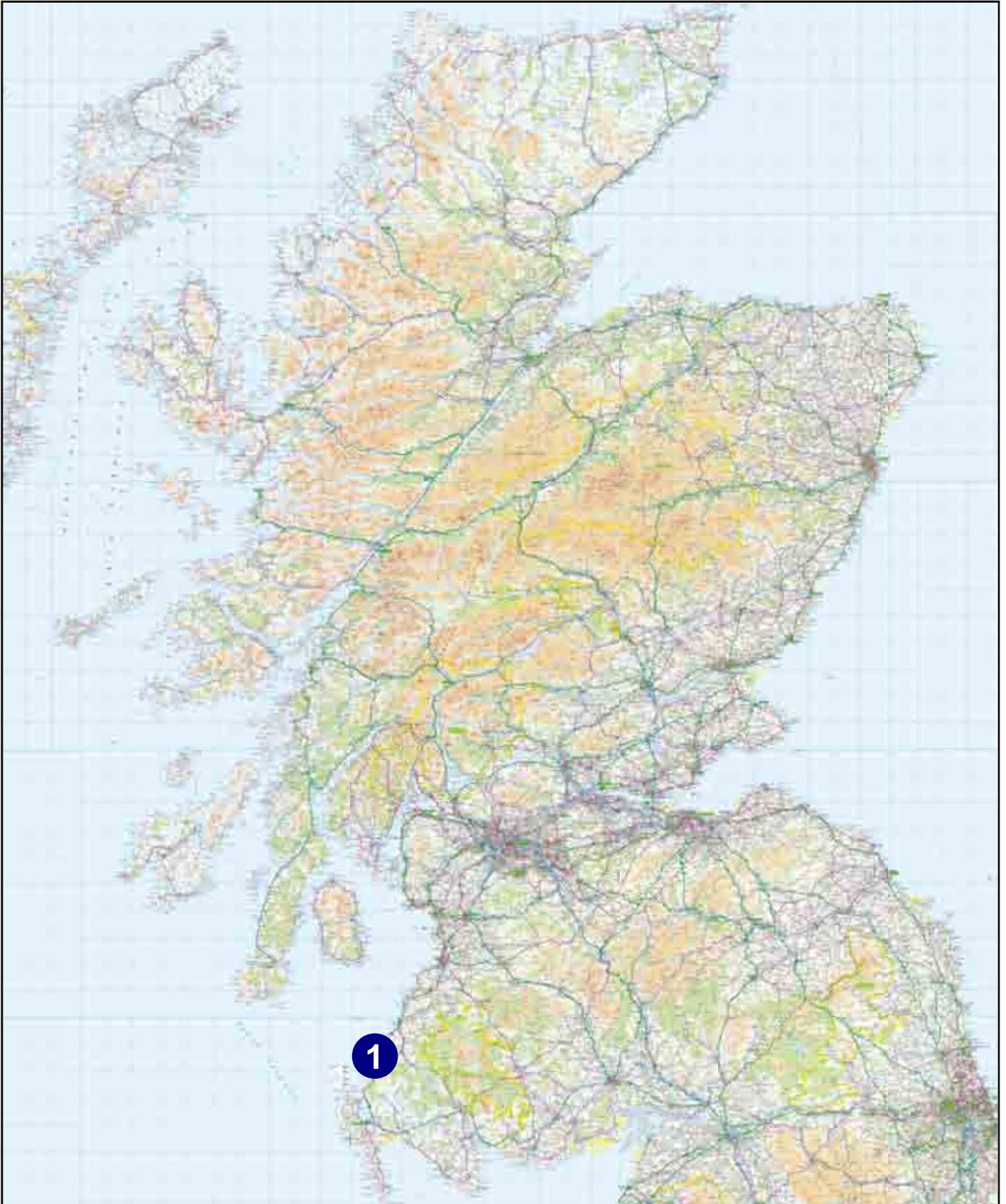
As recommended in STRIPE, this report constitutes a One-Year After Opening (1YA) Evaluation Report. It is a standalone report on the A77(T) Park End to Bennane project. This project fits the criteria for evaluation at this stage, as it cost over £5m and was completed and opened to traffic in the 2011/12 financial year.

Table 2.1 Summary details – A77(T) Park End to Bennane

Route	Project Name	Standard	Length (km)	Open to Traffic
A77(T)	Park End to Bennane	WS2+1	2.9	July 2011

Key: WS2+1 Wide Single 2+1-Lane Carriageway

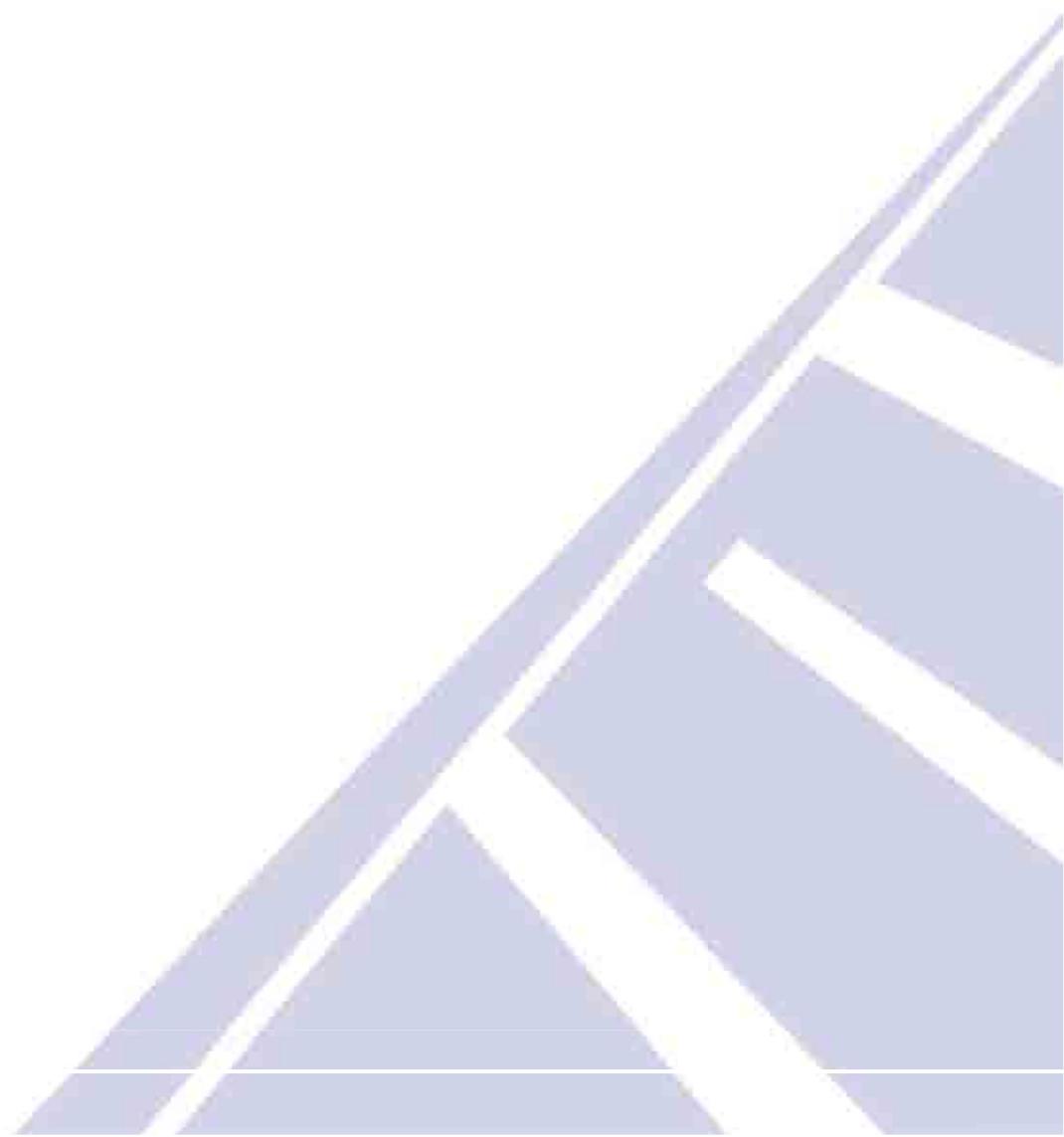
The location of the A77(T) Park End to Bennane scheme is presented in Figure 2.1.



1. A77(T) Park End to Bennane

Locations of Projects Evaluated
Figure 2.1

Detail of Evaluation



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3 A77(T) PARK END TO BENNANE

3.1 Introduction

Project Description

The A77(T) between Girvan and Stranraer is approximately 46km in length, and is located across the South Ayrshire and Dumfries and Galloway Council areas. It is an important strategic road in the south-west of Scotland, linking Glasgow and the Central Belt with Ayrshire and the Loch Ryan ferry ports.

The A77(T) Park End to Benanne project involved the improvement and widening of the existing A77(T) over approximately 2.9 kilometres to provide unambiguous, guaranteed overtaking in both directions through the provision of wide single 2+1 carriageway (WS2+1). The layout of the WS2+1 scheme is such that approximately 0.7 kilometres of unambiguous overtaking is provided in each direction, with the 2-lane overtaking sections facing each other on approach to the changeover.

The general location of the project is shown in Figure 3.1.

The A77(T) Park End to Bennane project was officially opened to traffic in July 2011.

Rationale and mandate for the scheme

The project was implemented in conjunction with the wider Route Action Plan for the A77(T), which included a number of other overtaking projects on the A77(T) which are reported within previous evaluation reports.

In combination with other overtaking projects on the A77(T), the Park End to Bennane scheme was targeted principally to break up platoons created by either slower moving agricultural vehicles or traffic disembarking from Irish Sea ferries.

The decision to invest in the scheme was made by Transport Scotland in July 2008.

Project Objectives

The objectives of the A77(T) Park End to Bennane project were set as follows:

- To improve and increase the number of overtaking opportunities to eradicate conflicts between long distance users and local / agricultural traffic;
- To improve the operational performance and level of services and safety on the A77(T) by reducing the effects of driver stress and journey times;

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- by constructing dedicated overtaking sections designed to break up the effects of convoys / platoons of vehicles;
- To maintain the asset value of the A77(T) route;
- To mitigate the environmental impact of the new works where possible; and
- To achieve good value for money for both tax payers and transport users.

3.2 Evaluation Methodology

As set out in Section 2.1, this report presents the results of a 1YA Opening Evaluation of the A77(T) Park End to Bennane 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 achieve its objectives.

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

This evaluation was supported by a site visit carried out on 2nd August 2013. External stakeholder views were invited from South Ayrshire Council and Stena Line. These are presented throughout the report.

3.3 The operation of the scheme and process evaluation

Network Traffic

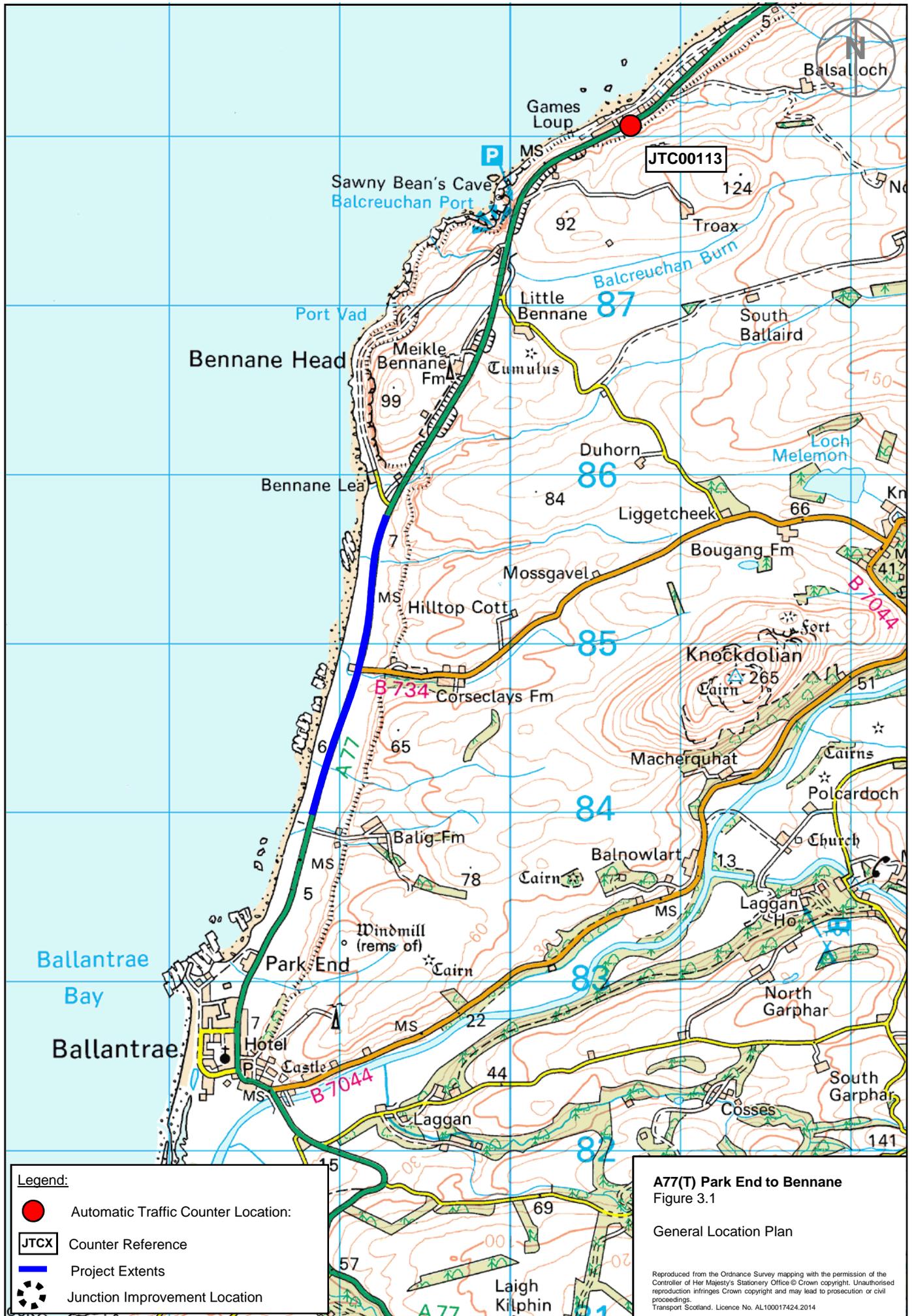
The evaluation is supported by the consideration of pre and post opening comparison of operational indicators, which focuses on network traffic indicators including traffic volumes and travel times, presented in the following section.

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 A77(T) route within the vicinity of the project are presented in Table 3.1.



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Table 3.1: A77(T) Park End to Bennane – ATC Data

ATC Reference	AADT by Year					
	2007	2008	2009	2010	2011	2012
A77(T) Bennane 3.5 km North of Ballantrae (North of the project)						
JTC00113	3,742	3,659	3,756	3,852	Year of Opening	3,750

A comparison between pre and post opening traffic volumes on the A77(T) within the vicinity of the scheme indicates that traffic flows in 2012 were broadly consistent with 2007 and 2009 flow levels. Traffic volumes between 2010 and 2012 reduced by approximately 100 vehicles per day (vpd) (3%).

Given the nature of the A77(T) Park End to Bennane 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 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 A77(T) Park End to Bennane 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) low and high traffic growth factors were applied to the 2004 base year traffic flows to derive opening and future modelled assessment year traffic flows.

Predicted traffic flows for 2012 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 3.2 below.

Table 3.2: A77(T) Park End to Bennane – Traffic Analysis Summary

ATC Ref	Actual AADT*	Predicted AADT (2012)			% Difference (Predicted – Actual) / Actual		
		Low	60/40	High	Low	60/40	High
A77(T) Bennane 3.5 km North of Ballantrae (North of the project)							
JTC00113	3,750	3,688	3,763	3,874	-1.6%	0.3%	3.3%

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

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The comparison between predicted and actual AADT flows in Table 3.2 indicates that the predicted 2012 flow (derived by interpolating between the modelled assessment year traffic flows) was 1.6% lower and 3.3% greater than the observed 2012 flow under low and high traffic forecast scenarios respectively, which is well within accepted limits.

Overtaking Opportunities

Comparison Between Pre and Post Opening Overtaking Opportunities

A post opening overtaking survey was undertaken on the A77(T) in November 2011 to provide an indication of conditions within the vicinity of the Park End to Bennane project.

The pre and post opening surveys recorded the number of overtaking manoeuvres, platooning and vehicle speeds on the A77(T) in both directions of travel within the direct vicinity of the project and on the single carriageway sections on approach to the project's location.

The results from the post opening survey were compared against the results from a pre-opening survey undertaken in March 2004 to provide an indication of the effect that the project has had on overtaking conditions.

The level of overtaking pre and post opening is shown in Table 3.3 below.

Table 3.3: A77(T) Park End to Bennane – Level of Overtaking

	AM Survey Period		PM Survey Period	
	Northbound	Southbound	Northbound	Southbound
Pre Opening	19%	5%	22%	12%
Post Opening	17%	14%	19%	17%

A comparison between the percentage of vehicles that carried out an overtaking manoeuvre during the pre and post opening surveys suggests that the A77(T) Park End to Bennane scheme has increased overtaking in the southbound direction but reduced overtaking in the northbound direction over the extents of the survey site.

The percentage of northbound vehicles that carried out an overtaking manoeuvre during the pre-opening survey AM and PM periods was 19% and 22% respectively, which can be compared to 17% and 19% respectively during the post opening survey.

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In the southbound direction, 5% and 12% of all southbound vehicles that travelled through the survey site during the pre-opening survey AM and PM survey periods respectively carried out an overtaking manoeuvre, which can be compared against 14% and 17% respectively during the post opening survey.

It is noted, however, that temporary roadworks were present on site to the north of Ballantrae on the day of the pre opening survey which comprised a section of temporary shuttleworking controlled by traffic signals.

A review of the pre opening survey data suggests that, as a result of the works, southbound drivers (who would have had advanced warning of the roadworks) may not have performed overtaking manoeuvres on approach to the shuttleworking section. Conversely, northbound drivers (who would have been in platoons as a result of the temporary traffic signals) may have been inclined to overtake slower moving vehicles when pulling away from the roadworks.

Due to the temporary roadworks present on the day of survey within the vicinity of the survey site, it is considered that the results of the pre opening survey for the Park End to Bennane scheme are not representative of typical operating conditions and, as such, it is difficult to draw any firm conclusions from the comparison of the level of overtaking manoeuvres carried out during the pre and post opening surveys.

Comparison Between Pre and Post Opening Platoons

Pre and post opening platooning data, collected as part of the pre and post opening overtaking surveys, was available for the AM and PM survey periods.

The results from the post opening survey were compared against the results from a pre-opening survey undertaken in March 2004 to provide an indication of the effect that the project has had on platooning conditions.

The level of platooning pre and post opening is shown in Tables 3.4a and 3.4b below. "Enter" indicates the point at which vehicles enter the 2.9km section whereas "Exit" indicates the point at which vehicles leave the section.

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Table 3.4a: A77(T) Park End to Bennane – Number of Platoons (AM Survey Period)

Platoon Length (vehicles)	Pre Opening Survey				Post Opening Survey			
	Northbound		Southbound		Northbound		Southbound	
	Enter	Exit	Enter	Exit	Enter	Exit	Enter	Exit
2	15	23	28	37	39	35	29	26
3	12	8	5	6	11	14	5	9
4	2	6	0	4	5	3	3	4
5	3	1	1	1	3	1	1	0
>5	3	8	0	0	1	3	0	0
Total	35	46	34	48	59	56	38	39

Table 3.4b: A77(T) Park End to Bennane – Number of Platoons (PM Survey Period)

Platoon Length (vehicles)	Pre Opening Survey				Post Opening Survey			
	Northbound		Southbound		Northbound		Southbound	
	Enter	Exit	Enter	Exit	Enter	Exit	Enter	Exit
2	30	34	24	43	60	51	64	66
3	18	24	9	17	15	21	23	17
4	6	8	7	11	3	9	3	5
5	3	7	1	7	2	2	1	0
>5	5	13	3	7	3	4	0	1
Total	62	86	44	85	83	87	91	89

The post opening survey indicated that the total number of platoons that exited the survey site in the northbound direction during the AM survey period and in the southbound direction during the PM survey period were less than the total number that entered the site. The post opening survey also indicated that the total number of platoons that exited the survey site in the southbound direction during the AM survey period and in the northbound direction during the PM survey period were greater than the total number that entered the site.

Examination of the results suggests that the number of platoons of three vehicles or more generated through the dispersion of vehicles in 'larger' platoons were not outweighed by the number of vehicles that were no longer in platoon as they exited the site due to the dispersion of 'smaller' platoons.

A comparison between the total number of platoons that entered and exited the survey site during the pre and post opening surveys suggests that, overall, the A77(T) Park End to Bennane scheme has a positive effect on the dispersion of vehicles in platoon as a consequence of the increase in vehicles carrying out overtaking manoeuvres.

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It is noted, however, that due to temporary roadworks in the vicinity on the day of the pre opening survey, the proportion of vehicles recorded as traveling in a longer platoon was much greater than typically observed at this site, particularly in the northbound direction of travel. As such it is considered that the results of the pre opening survey for the Park End to Bennane scheme are not representative of typical operating conditions and, therefore, it is difficult to draw any firm conclusions from the comparison of the number of platoons occurring during the pre and post opening surveys.

Stakeholder feedback

Stena Line Ltd, who operate ferry services at Cairnryan, was invited to offer feedback on the A77(T) Park End to Bennane scheme. Their overall perception of the scheme was that it had a neutral impact on traffic using their services. South Ayrshire Council were also asked for their views on the scheme – their feedback suggested it had positively facilitated opportunities for overtaking and led to improved travel times. South Ayrshire Council noted that when linked to previous improvements on the route, the scheme had facilitated opportunities for overtaking between Ballantrae and Lendalfoot, a stretch of nearly 6 miles.

Travel Times

Comparison Between Pre and Post Opening Journey Times

Mean vehicle speeds during the AM and PM survey periods, estimated from the information collected as part of the pre and post opening overtaking surveys, have been used as a proxy for changes in travel times.

A comparison between the mean vehicle speeds observed during the pre and post opening overtaking surveys is shown in Table 3.5.

Table 3.5: A77(T) Park End to Bennane – Assessment of Mean Vehicle Speeds (mph)

	AM Survey Period		PM Survey Period	
	Northbound	Southbound	Northbound	Southbound
Pre Opening	32	35	34	35
Post Opening	60	57	59	63

The comparison between mean vehicle speeds over the extents of the survey site indicate that speeds in both directions of travel have increased within the vicinity of the Park End to Bennane project, however, the pre opening survey is not considered representative of typical operating conditions as a result of temporary roadworks present on the day of survey which impacted on vehicle speeds in both the northbound and southbound directions of travel. As such, it is difficult to draw any firm conclusions from the comparison of the mean vehicle speeds observed during the pre and post opening surveys.

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Based on the distances between the cameras used for the post opening survey, mean southbound vehicle speeds have been estimated to exceed the national speed limit in force over the extent of the survey site.

3.4 Environment

The following section provides a summary of the assessment of environmental mitigation measures proposed for the A77(T) Park End to Bennane scheme. A fuller report is provided in Appendix B.

Review of Environmental Mitigation Measures

The environmental mitigation measures originally proposed for the A77(T) Park End to Bennane project were obtained from the project's ES¹. A review of the environmental mitigation measures was carried out in August 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
- Cultural Heritage
- Physical Fitness

Findings

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.

¹A77 Park End to Bennane Improvement Scheme Stage 3 Environmental Assessment Report, Amey. (2008)

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Much of the mitigation which was included within the ES has been implemented on site and is in good condition. The site inspection did identify some potential issues relating to the construction of footways at certain locations which did not appear to tie into a contiguous path network or result in any immediately obvious benefit to the environment and pedestrians of the surrounding area. Each path is located at a crossing of the A77 where footways to the west of the scheme provide access to the shore. Consultation with affected proprietors during the scheme's design indicated that the footways accessing the shore were in occasional use and provided access to properties associated with Ballig Farm.

The A77(T) Park End to Bennane scheme fits well within the existing landscape and the wider, mixed grass verges and the retention (and addition) of stone walls along the length of the route further integrate the scheme into the existing environment.

The scheme integrates well with the climbing lane scheme to the north, as well as creating an effective entrance into the village of Ballantrae to the south, which has been integrated so as to encourage motorists to reduce their speed when approaching the village.

Environment: Key Findings

Much of the mitigation which was included within the ES has been implemented on site and is in good condition.

The site inspection identified some potential issues related to the implementation of footways at certain locations which do not tie into a path network or seem to result in any obvious benefit to the environment and pedestrians of the surrounding area. Consultation with affected proprietors during the scheme's design confirmed the need for the provision of footways at these locations.

Key recommendations

It is recommended that the review of environmental mitigation measures proposed for future schemes continues to be undertaken during the detailed design process to determine whether the recommended mitigation is appropriate to the overall scheme.

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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 A77(T) Park End to Bennane project 3 years before and 1 year after project completion are shown in Figures 3.2a and 3.2b.

A summary of the personal injury accident data is shown in Table 3.6.

Table 3.6: A77(T) Park End to Bennane – Accident Data Summary

Period	Fatal	Serious	Slight	Total Accidents
3 Years Before				
A77(T)	0	0	1	1
1 Year After				
A77(T)	0	0	0	0

As can be seen from Table 3.6, no personal injury accidents occurred in the 1 year period following the opening of the project in comparison to one personal injury accident (slight) in the 3 years before opening, suggesting a potential improvement in road safety.

Road Safety Audits

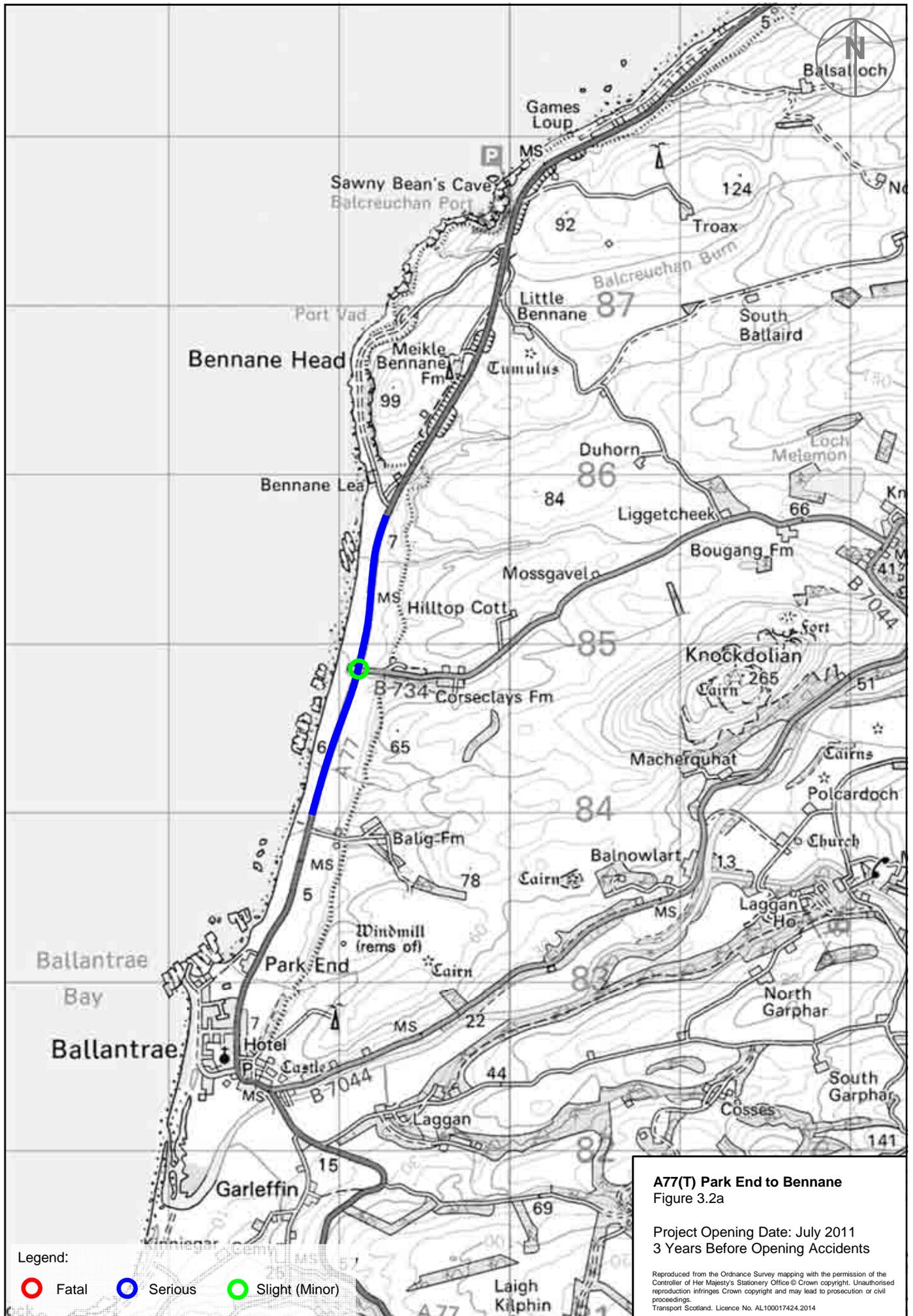
The RSA process has been followed, with Stage 1, 2, 3 and 4 Audits carried out. The Stage 4 RSA report examined the 3 year period prior to construction (30 September 2007 to 1 October 2010) and the 1 year period following opening. The Stage 4 RSA confirmed that no accidents had occurred within the vicinity of the scheme following opening and confirmed that no trends or common factors in accidents had been observed.

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 A77(T) Park End to Bennane project is operating safely.

Recommendations

The Stage 4 RSA suggests that the scheme should continue to be monitored to confirm that it is operating satisfactorily.



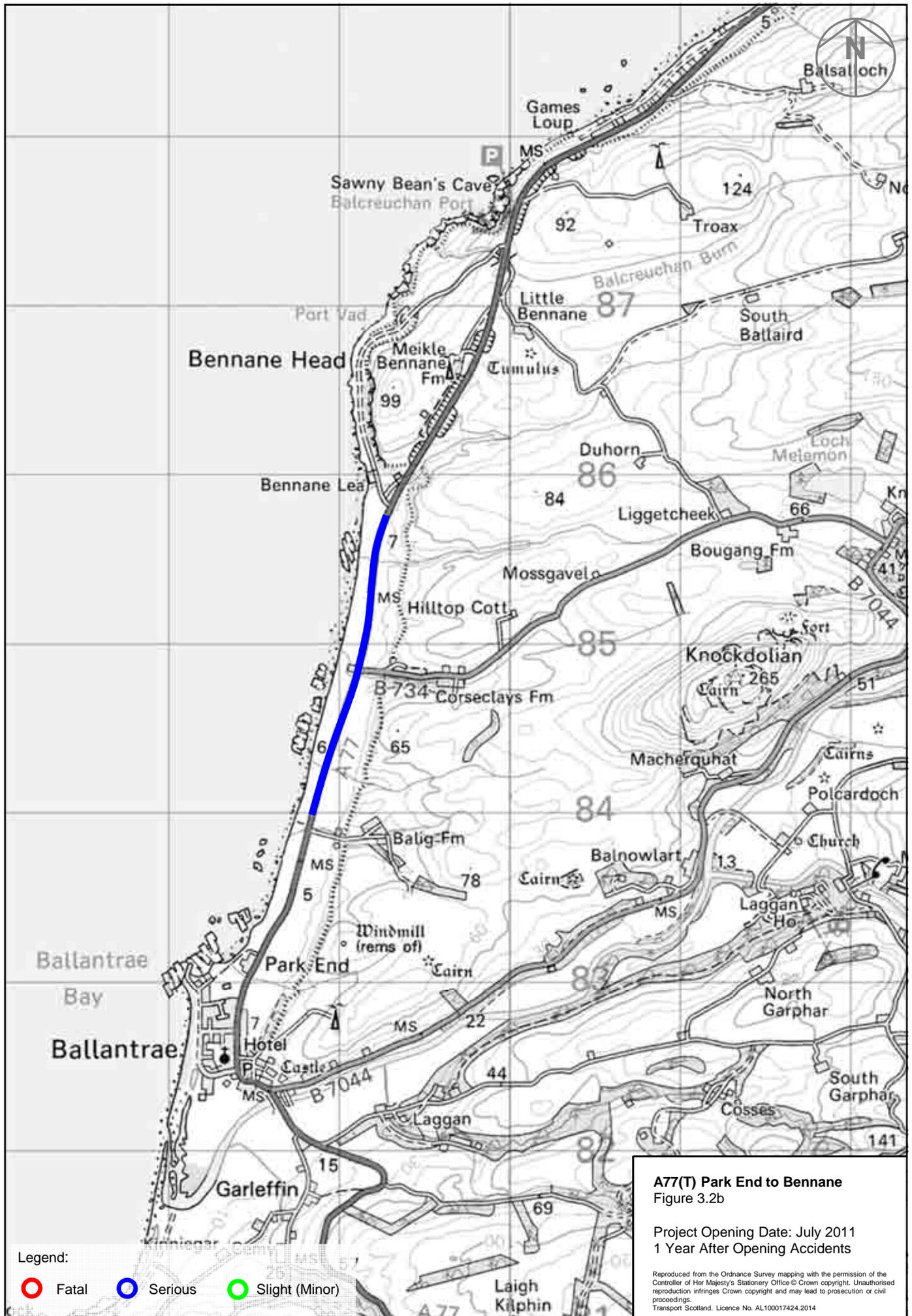
Legend:

- Fatal
- Serious
- Slight (Minor)

A77(T) Park End to Bennane
Figure 3.2a

Project Opening Date: July 2011
3 Years Before Opening Accidents

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3.6 Economy

Transport Economic Efficiency

Recommended changes to the design standards, set out in DMRB Volume 6, TD 70/08 – Design of Wide Single 2+1 Roads, were introduced during the project’s construction. As a result of implementing these changes, the length of the overtaking section provided is shorter than that modelled during the project’s appraisal. It is therefore likely that the level of overtaking has been over predicted and consequently the economic benefits of the project will be less than predicted.

Comparison Between Predicted and Actual Traffic Flows

The comparison indicates that the predicted 2012 flows were within 3.3% of the observed 2012 flows on the A77(T) within the vicinity of the Park End to Bennane scheme, which is well within accepted limits.

Stakeholder feedback

Stena Line Ltd commented that this specific scheme, on its own, had not any observable impact on their ferry operations.

Economy: Key Findings

The difference between predicted and actual AADT flows suggests that the economic benefits are in line with that predicted. As the length of overtaking provided is shorter than that modelled, the economic benefits of the project may be less than predicted.

3.7 Cost to Government

Investment Costs

Comparison Between Predicted and Out-turn Costs

The out-turn and predicted project costs are shown in Table 3.7.

Table 3.7: A77(T) Park End to Bennane – Project Cost Summary

	Out-turn Cost		Predicted Cost		Difference (Out-turn - Pred)
	@ June 2013	Mid-02 Prices in 2002 at 3.5% Discount	March 07 Prices incl 25% OB	Prices in 2002 at 3.5% Discount	Mid-02 Prices in 2002 at 3.5% Discount
Total	£6,786,254	£3,968,280	£5,433,816	£3,859,595	£108,685 (3%)

SCOTTISH TRUNK ROAD INFRASTRUCTURE PROJECT EVALUATION

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Cost to Government: Key Findings

The out-turn cost of the A77(T) Park End to Bennane project is approximately £0.11m (3%) greater than was predicted at the time of assessment.

3.8 Value for Money

Initial Indications

The economic appraisal results for the A77(T) Park End to Bennane project predicted a Net Present Value (NPV) of £0.74m and Benefit to Cost Ratio (BCR) of 1.26 under the 60/40 traffic forecast scenario.

Based on the comparisons presented in Sections 3.6 and 3.7, 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 as a consequence of reduced traffic levels as a result of the economic downturn, it is judged that the project will continue to provide benefits to road users.

3.9 Progress Towards Achieving Objectives

As specific indicators to measure the performance of the A77(T) Park End to Bennane 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 A77(T) Park End to Bennane project is progressing towards achieving its objectives, is presented in Table 3.8.

SCOTTISH TRUNK ROAD INFRASTRUCTURE **PROJECT EVALUATION**

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Table 3.8: A77(T) Park End to Bennane – Progress Towards Achieving Objectives

Objective	Commentary	Progress
<p>Improve and increase the number of overtaking opportunities to eradicate the conflicts between long distance users and local / agricultural traffic.</p>	<p>A comparison between the results of the pre and post overtaking surveys indicate that the provision of a dedicated overtaking opportunity has increased overtaking in the southbound direction of travel with a minimal impact on the northbound direction of travel.</p> <p>The results of the pre opening survey, however, are not representative of typical operating conditions and, as such, it is difficult to draw any firm conclusions from the comparison of the level of overtaking manoeuvres carried out during the pre and post opening surveys.</p> <p>The provision of the WS2+1 is likely to have a positive impact on the number of overtaking manoeuvres.</p>	<p>=</p>
<p>Improve the operational performance and level of services and safety on the A77(T) by reducing the effects of driver stress and journey times by constructing dedicated overtaking sections designed to break up the effects of convoys / platoons.</p>	<p>Mean vehicle speeds in both directions of travel have increased as a result of the A77(T) Park End to Bennane project, and a comparison between the results of the pre and post overtaking surveys indicate that as a consequence of the increased overtaking in the southbound direction, a greater number of platoons are dispersed.</p> <p>The results of the pre opening survey, however, are not representative of typical operating conditions and, as such, it is difficult to draw any firm conclusions from the comparison of mean vehicle speeds and platooning during the pre and post opening surveys.</p> <p>The provision of the WS2+1 can be expected to help disperse platoons in both directions of travel as a consequence of the positive impact the A77(T) Park End to Bennane project is likely to have on overtaking manoeuvres.</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 A77(T) Park End to Bennane project is operating</p>	<p>+ve</p>

SCOTTISH TRUNK ROAD INFRASTRUCTURE **PROJECT EVALUATION**

TRANSPORT **SCOTLAND**

Objective	Commentary	Progress
	safely.	
Maintain the asset value of the A77(T) route.	Given the nature of the A77(T) Park End to Bennane project, which involved replacing 2.9 kilometres of existing single carriageway with 1.0 kilometre of wide single 2+1 carriageway and 1.9 kilometres of on-line improvements, the asset value of the A77(T) between the project tie-in points is likely to have increased thus maintaining the value of the route.	+ve
Mitigate the environmental impact of the new works where possible.	<p>The majority of the measures committed within the Environmental Statement have implemented on site and are in good condition.</p> <p>The A77(T) Park End to Bennane scheme fits well within the existing landscape and the wider, mixed grass verges and the retention (and addition) of stone walls along the length of the route further integrate the scheme into the existing environment.</p> <p>The scheme integrates well with the climbing lane scheme to the north, as well as creating an effective entrance into the village of Ballantrae to the south which has been integrated in such a way as to encourage motorists to reduce their speed when both exiting and accessing the village.</p>	+ve
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 Park End to Bennane project forms part of a series of improvements along the A77(T) corridor that can be expected to provide benefits to transport users and help encourage economic development within south west Scotland and beyond.	=

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 its objectives and the following criteria, to support the evaluation:

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

As the evaluation focuses on impacts relating to the project's objectives, evaluations against all of the criteria set out within STRIPE may not be undertaken for all projects. In this evaluation of the A77(T) Park End to Bennane, no assessment has been carried out against the criteria of Integration, Accessibility and Social Inclusion, as the scheme did not have any transport planning objectives related to these criteria.

The evaluation is supported by the consideration of network traffic indicators, including traffic volumes, overtaking opportunities and travel speeds (as a proxy for 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 the project 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 the project 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

Pre and Post Opening Overtaking Opportunities

Both pre and post-opening overtaking surveys were carried out on this scheme. The pre-opening surveys informed the scheme assessment, whilst the post-opening surveys were commissioned by Transport Scotland to inform post-opening evaluation and an overall assessment of the performance of WS2+1 schemes in Scotland.

Temporary roadworks were present on site to the north of Ballantrae on the day of the pre opening survey which comprised a section of temporary shuttleworking controlled by traffic signals and it is considered that the results of the pre opening survey for the Park End to Bennane scheme are not representative of typical operating conditions.

As such, it is difficult to draw any firm conclusions from the comparison of the level of overtaking manoeuvres carried out during the pre and post opening surveys.

Pre and Post Opening Platooning levels

For this scheme, data on pre and post opening platooning levels was available, and has been reported in this evaluation.

Temporary roadworks were present on site to the north of Ballantrae on the day of the pre opening survey which comprised a section of temporary shuttleworking controlled by traffic signals and it is considered that the results of the pre opening survey for the Park End to Bennane scheme are not representative of typical operating conditions.

As such, it is difficult to draw any firm conclusions from the comparison of the number of platoons occurring during the pre and post opening surveys.

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

Data Sources

Pre and Post Opening Overtaking Conditions and Platooning levels	Judged from pre and post opening survey information for this scheme.
Stakeholder Feedback	Obtained from South Ayrshire Council and Stena Line.

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 not been carried out for this scheme as data was not available. However, pre and post-opening speed data has been used as a proxy for this analysis, the assumption being higher speeds may result in shorter journey times.

Comparison Between Predicted and Actual Travel Times

A comparison between predicted and actual travel times has not been carried out for this scheme as predicted and post opening travel time information was not readily available.

Data Sources

Pre and Post Opening Travel Times	Proxy indicator of traffic speed confirmed through pre and post opening survey information collected to support the project's economic assessment.
Stakeholder Feedback	Obtained from Stena Line Ltd and South Ayrshire Council.

A.3 ENVIRONMENTAL

Mitigation Measures

A review of the environmental mitigation measures implemented during construction has been undertaken for the project 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 the project 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 the project 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 Stena Line.
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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 is provided for projects that have specific objectives relating to the Accessibility & Social Inclusion criterion. However, in this instance, no scheme objectives related to Accessibility and Social Inclusion, and this criteria has therefore not been assessed.

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 the project 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 3.7 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/or 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/or 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 Evaluations (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 the A77 Park End to Bennane were obtained from the project's ES¹. A review of the environmental mitigation measures was carried out in July 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.

Noise and Vibration

The ES identify that low noise surfacing should be used for the scheme to reduce noise impacts for locally sensitive receptors. From the site visit undertaken it is unclear whether or not low noise surfacing has been utilised in the construction of the scheme. Clarification on this matter was sought and confirmation was received that the surfacing treatment was "thin surface material supplied by Barr's and this is likely to be low noise.

Land Compensation (Scotland) Act 1973

Not applicable.

Impact of Project on Noise and Vibration

No noise monitoring has been undertaken as part of this review to confirm whether noise levels are higher or lower than those experienced prior to construction.

A77 Park End to Bennane Improvement Scheme, Stage 3 Environmental Assessment Report (January 2008), Amey on behalf of Transport Scotland.

Global and Local Air Quality

Assessments undertaken as part of the ES determined that no mitigation measures were necessary for the operation of the scheme. No issues relating to either global or local air quality were identified during the environmental mitigation measures review.

Impact of Project on Global and Local Air Quality

The comparison between pre and post project opening traffic within the study area can be considered a proxy for the impact that the project is likely to have on both global and local air quality.

Given that the proposed scheme is not considered to generate any significant additional traffic, and the ES did not identify the requirement for incorporating any mitigation measures to reduce the impact upon global or local air quality, it is not considered that any significant impacts are occurring. Therefore a comparison between pre and post project opening data has not been undertaken.

Water Quality, Drainage and Flood Defence

Over-sized culverts were provided at each of the crossing points over watercourses. The site was visited after a period of wet weather and no flooding of the road surface or the surrounding land was observed. The culverts were overgrown with vegetation in some cases, but they remained clear of debris and water was observed to be free flowing through each of the structures.

It was considered that the implementation of the mitigation is appropriate to the site setting, and has been successful in its operation.

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

The ES contained commitments for the protection of otters, and to create diverse grassland along the road verges.

The road verges were confirmed as being appropriately wide, and contained diverse grass species as well as several types of wildflower which suited the overall setting of the road corridor. Furthermore, the widened verges and grass mix that had been used formed a good linkage with the climbing lane constructed to the north of the Park End to Bennane scheme.



Plate 1: Widened hard strip and grass verge showing grass and wildflower mix

All three culverts constructed as part of the scheme have a separate otter tunnel running adjacent to the main culvert.

The southern culvert at Balig Farm had been constructed and otter fencing provided which extended c.100m to either side of the dry culvert for guiding otters towards the safe crossing point. Furthermore on the eastern side of the A77 a stone wall running the length of the scheme acted as an additional barrier to otter movements on to the A77 (both the fencing and wall were inspected and were deemed to be in good condition with no holes identified). There was no evidence of otters having used the culverts recently.

The central culvert, located at the junction with the B734 did not have any otter fencing present on the eastern side of the carriageway. A stone wall did provide a barrier to access to the A77, however, and a gate located within the wall had been appropriately fenced to prevent otters accessing the A77 carriageway. No sign of otters utilising the culvert was found on site.



Plate 2: gate within stone wall which had otter fencing built in



Plate 3: Culverted watercourse with associated dry otter tunnel

The northern culvert was well fenced for a distance of c.200m north and south of the dry culvert mouth on the west side of the A77. To the east, stone walls and a fenced farm access gate provided a barrier to access for otters to the A77. Both the culvert and the associated dry culvert for the otters were quite overgrown and thus hidden with vegetation and no sign of otters accessing the culvert was found.

Landscape & Visual Amenity

The key landscape features to be retained or improved along the scheme, were the widening of the road verges, and the retention / repair of stone walls along the route.

As stated above in the ecological section, the widened grass verges had been planted with mixed grasses and some wildflowers. The verges were in good condition and fitted the overall landscape of both the road, and the surrounding area.

The stone walls along the scheme were a good link to the surrounding landscape and field boundaries, particularly to the east of the A77 scheme. The repair and implementation of new walls was very sympathetic to the surrounding landscape and provided a quality landscape feature. The walls tied in to the northern climbing lane scheme very well.



Plate 4: view north along the scheme to its integration with the previously constructed climbing lane. View shows widened verges and the stone walls along its length



Plate 5: further views north along the scheme

Overall the scheme is a very good fit in to the wider landscape of the area. The design of the scheme was sympathetic to the wider landscape of the area and provided a good tie in to the wider trunk road network.

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

The mitigation within the ES identified that a milestone (which was removed during construction) be reinstated. The milestone was identified on site, and its reinstatement fits with the rest of this section of the A77 which has milestones located along its length between Girvan and Ballantrae.



Plate 6: Reinstated mile marker

Physical Fitness

The ES identified the need for new footways to be created at the junctions with the B734, and the Ballig Farm access road, this was identified as providing benefits to non-motorised users (NMU) through the creation of wider verges and footpaths. It would appear that the key impact for pedestrians / cyclists is the fast moving traffic on the A77 itself, and the creation of wider hard strips and grass verges was identified as mitigation for alleviating pedestrian safety concerns, however this was not stated in the Environmental Statement.

The site visit identified that footways have been constructed at both locations identified in Appendix One of the ES. However, it is unclear why footways were implemented at these locations. Neither of the new footpaths tie in to a wider path network along the B734 or the farm access road, nor do they tie in to a path network running south to Ballantrae. Each path is located at a crossing of the A77 where footways to the west of the scheme provide access to the beach. The footways do not appear to form a contiguous NMU route along the scheme and into the town of Ballantrae. The ES did not identify any particular concerns which would require footpaths at the constructed locations. Safety concerns for pedestrians / cyclists utilising the A77 was the key concern identified and this is addressed through the construction of footways, wider hard strips and grass verges.



Plate 7: New footpath on the western side of the scheme



Plate 8: New footpath on the eastern side of the scheme

The site visit did not discern any significant benefits from having these short sections of footway at the junctions as NMU seeking to access the footpaths has to walk a significant distance along the verges of existing roads.

Recommendation

It is recommended that during the detailed design process prior to construction, a review of the environmental mitigation is conducted to determine whether the recommended mitigation is appropriate to the overall scheme. If no discernible benefits can be identified from the inclusion of specific mitigation measures then their inclusion in the final scheme should be reviewed.

The creation of a new gateway feature at the entrance to Ballantrae does produce a better visual experience for drivers, furthermore, the presence of a traffic island at the entrance to the village encourages drivers to slow down on the approach to the village. It is considered that this mitigation measure is a very effective measure for both the visual environment, and the safety of the people within the village through helping to reduce vehicular speeds on the A77 within the built up area.



Plate 9: Entrance to the village of Ballantrae with new speed limit signs and central island on the A77

Land Use

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

Vehicle Travellers

The reinstatement of the stone walls and a milestone along the route give the scheme a finished look, and they mean that there are definitive landscape features along the route which help to provide a beneficial driving experience. The overall design of the scheme and the way it fits into both the wider landscape, and also into other trunk road schemes along this section of the A77, which enhances the overall setting of the scheme.

Environment: Conclusion

Much of the mitigation which was included within the ES has been implemented on site and is in good condition. However, the site inspection did highlight some issues related to the implementation of mitigation which does not seem to result in any significant benefit to NMUs.

The A77 Park End to Bennane scheme not only fits well within the existing landscape but the wider, mixed grass verges and the retention (and addition) of stone walls along the length of the route further integrate the scheme into the existing environment. The scheme links well into the climbing lane scheme to the north, as well as creating an effective entrance into the village of Ballantrae to the south which has been integrated in such a way as to encourage motorists to reduce their speed when both exiting and accessing the village.

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 کمپوٹی 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 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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Transport Scotland, Buchanan House,
58 Port Dundas Road, Glasgow, G4 0HF
0141 272 7100
info@transportscotland.gsi.gov.uk
www.transportscotland.gov.uk

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