Post Opening Project Evaluation

A69 Haydon Bridge Bypass

Image Source: CVC Highway Solutions

Five Years After Study

October 2015

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Executive Summary

Scheme Description

The A69 Haydon Bridge Bypass scheme is a Highways England (formerly known as the Highways Agency) major scheme located between Newcastle and Carlisle, which opened in March 2009. Before the scheme opened, the A69 passed through the village of Haydon Bridge and the high traffic volume caused problems such as; poor air quality, traffic noise and community severance. The scheme involved the construction of a bypass to the south of the village to remove through traffic from the village and address the problems associated with the high traffic volumes.

Scheme Objectives

Objectives *Source: Highways England Non-Technical Summary of the Environmental Statement (June 2005)*	**Objective Achieved?**
Improve safety for all road users in Haydon Bridge by removing through traffic and by providing a better standard of trunk road.	✓
Reduce congestion and delays along the A69.	**Not Applicable**
Ease the existing problems of community severance, noise and air pollution by improving the environment for residents, pedestrians and cyclists in Haydon Bridge.	✓
Provide an environmentally acceptable solution that minimises the impact on the built and natural environment.	✓

Key Findings

- Traffic flows in Haydon Bridge have reduced by approximately 12,000 vehicles per day (vpd), meaning around 3,000 vehicles per day now travel through Haydon Bridge. This shows that traffic has successfully reassigned from the old A69 to the bypass as 13,100 vehicles are using the scheme.
- Travelling along the A69 bypass takes between 22 and 45 seconds less than using the old A69 through Haydon Bridge. Observed journey times on the bypass are around 10 seconds lower than forecast.
- Before scheme opening journey time variability was low and traffic flows were relatively consistent throughout the day. Minimum average vehicle speeds were 27mph and therefore it is considered that congestion and delays were not an issue, hence the objective to 'reduce congestion and delays along the A69' is not applicable to the scheme.
- The scheme forecast collisions would increase by 0.2 per annum due to the introduction of two new junctions. Since scheme opening, average annual collision numbers have reduced by 0.3, however, statistical tests show that this cannot be attributed to the scheme itself.
- The scheme delivers a lower than forecast Benefit Cost Ratio (BCR) of 1.2 rather than 2.5 and this is due to journey time benefits being 33% lower than forecast.
- The majority of environmental impacts are as expected.

Summary of Scheme Impacts

Traffic

- Observed traffic flows on the bypass are 4% higher than predicted indicating that more traffic than forecast has transferred from the old route.
- Traffic flows on the old A69 have reduced by between 80% and 85%, which is slightly higher than the forecast reduction of between 70% and 80%. Observed flows on the old A69 are approximately 25%

lower than forecast, due to a combination of traffic growth being lower than the rate expected and more traffic than forecast transferring to the new route.
- Accounting for the potential background reduction of up to 5%, observed traffic flows on the A686, A69 outside of Haydon Bridge and Church Street have not changed.

Safety

- Within the Haydon Bridge area, collisions have reduced by 0.3 per annum, however statistical tests show that this is unlikely to be a result of the scheme.
- Observations of collision locations show that there are fewer collisions on the old A69 and this could be attributed a reduction of 12,000 vpd. Collision rates on the old A69 have reduced from 0.87 to 0.42 collisions per million vehicle kilometres travelled since the scheme opened and this reduction is higher than forecast.
- Post opening, there has been an observed increase in collisions at the eastern junction of the bypass with the A686 Alston Road, however, it is noted that the scheme appraisal recognised that the introduction of junctions may result in an increase in collisions. The One Year After (OYA) post opening report documented that new lighting had been installed at the eastern junction as a response to safety concerns, however, collision data shows that several collisions have occurred since the installation. The data shows that turning movements at the eastern junction from the bypass onto the A686 and vice versa are a common cause for collisions in this location.

Environment

- Traffic flows are lower than forecast in Haydon Bridge and impacts for noise and local air quality adjacent to the old A69 are considered to be better than expected.
- It is likely that biodiversity impacts generally are as expected, however, more detailed information would be required to confirm the success or otherwise of the mitigation measures incorporated into the scheme for species and habitats.
- Operational monitoring of river gravels was a commitment in the scheme Environmental Statement (ES) and there was also an agreement with the Environment Agency to provide such data if a 1 in 10 year flood event were to occur. A 1 in 10 flood event has occurred and it would appear that no post construction monitoring has been undertaken. In the absence of this, site visit observations and as built drawings indicate that the impact of the scheme on water and drainage is likely to be as expected.
- The Parish Council has raised concerns about the lack of a deceleration lane and driver vulnerability at the eastern bypass junction with the A686 Alston Road. Since OYA collisions at the eastern junction have increased and this may have led to fear of accidents being greater than expected.
- Townscape has benefitted as expected with the significant reductions in through traffic particularly HGVs, although not all the expected streetscape improvements have been taken forward. As part of the de-trunking works, the ES stated that trees would be planted along the old A69. The allowance put aside to undertake these works is reported to have been used to address issues with the old bridge over the river, although the consultation response from the Parish Council is not aware of any bridge works taking place.
- Landscape mitigation measures have been implemented in line with proposals; earthworks have provided immediate screening of traffic using the bypass, new planting is establishing well and dry stone walls help integrate the scheme into the local landscape by providing a sense of place.
- The impact of night time lighting is worse than expected for some properties as lighting was not envisaged at the time of the ES.

Accessibility and Integration

- Severance in the village has reduced as a result of the scheme. The reduced traffic flows make it safer to cross the road and reduce the need for the underpass.
- The scheme has had a beneficial impact on achieving local and central government policies including improving accessibility, air quality and noise in Haydon Bridge and protecting and enhancing the built and natural environment.

Summary of Scheme Economic Performance

All monetary figures in 2002 Prices and values		Forecast	Outturn Reforecast
Investment Cost in present value (PVC)		**£18.4m**	**£31.3m**
Journey Time Benefits		£32.9m	£21.9m
Vehicle Operating Costs		-£0.06m	-£0.06m
Safety Benefits		-£3.7m	£0m
Future Maintenance Benefits		£16.4m	£16.4m
Present Value Benefits		**£45.5m**	**£38.2m**
Indirect Tax		£0.08m	£0.08m
Benefit Cost Ratio (BCR)	**Indirect Tax impact treated as a Cost**	**2.5**	**1.2**
Benefit Cost Ratio (BCR)	**Indirect Tax impact treated as a Benefit**	**2.5**	**1.2**

- Journey time benefits are £21.9 million, 33% less than the £32.9 million forecast.
- The collision saving of 0.3 per annum was shown not to be significant, hence safety benefits were not monetised.
- The overall Present Value Benefit (without indirect tax) is £38.2 million, which is 16% less than the forecast £45.5 million.
- The total investment cost for the scheme was £32.5 million (2002 prices not discounted), 31% more than forecast.
- Regardless of indirect tax being treated as a benefit (current appraisal approach) or part of the cost, the outturn BCR of 1.2 is lower than forecast and indicates the scheme is delivering low value for money.

1. Introduction

Background

1.1 This report is the Five Years After (FYA) opening evaluation of the A69 Haydon Bridge bypass, which opened to traffic in March 2009. The evaluation has been prepared as part of Highways England's (formerly known as the Highways Agency) Post Opening Project Evaluation (POPE) programme. This report builds upon the findings of the One Year After (OYA) which was published in July 2012.

Scheme Context

1.2 Haydon Bridge is a village in Northumberland, located around 30 miles to the west of Newcastle and bisected by the South Tyne River and the main Newcastle to Carlisle railway line (as shown in Figure 1.1). The village has a population of approximately 2,000 and there are several tourist attractions in the local vicinity including Northumberland National Park and Hadrian's Wall. The A69 is a key east to west route connecting Newcastle and Carlisle, a key link between two north-south routes; the M6 and A1 and the all-weather route crossing the Pennines.

1.3 Before the scheme opened, the A69 passed through Haydon Bridge and the high volume of vehicles passing through the village led to several problems including; poor air quality, traffic noise, road safety and community severance.

1.4 To address these problems, a new bypass, which is still known as the A69, was built around the southern side of Haydon Bridge with the former A69 through the village being reclassified as the B6319 (also known as the old A69 / Ratcliffe Road). The scheme opened on the 25th March 2009.

Scheme Description

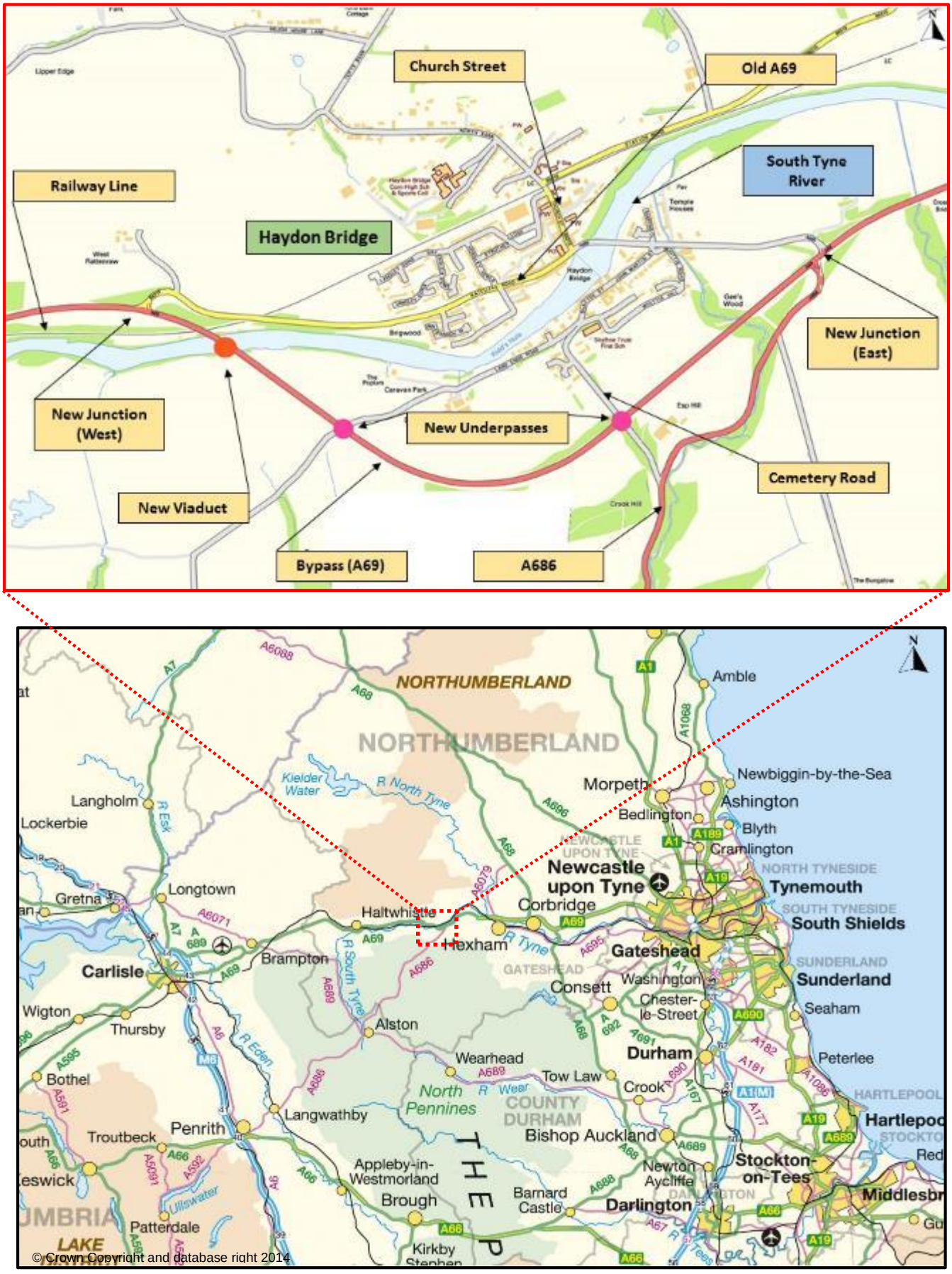
1.5 The scheme included the following features:

- A new single carriageway (7.3m + hardstrips) bypass (1.5 miles/2.9km in length).
- Two new underpasses along the bypass to maintain access on local roads.
- A new viaduct to allow the bypass to cross the railway line, river and surrounding floodplains.
- Realignment of junctions at either end of the scheme to maintain access to Haydon Bridge and the A686 including additional lighting at the eastern junction.

1.6 A key part of the scheme involved the construction of the viaduct which was designed to minimise the impact on the surrounding environment and involved extensive coordination between Highways England, Network Rail and United Utilities.

1.7 Figure 1.1 provides a detailed context of the scheme.

Figure 1.1 Geographical Context of A69 Haydon Bridge



Scheme History

1.8 A brief history of the events involved in the development of the scheme is provided in Table 1.1.

Table 1.1 Scheme Timeline

Date	Event
March 2003	Public Consultation
December 2003	Preferred Route Announced
March 2004	Design and Build contract awarded
April 2006	Public Inquiry
September 2006	Announcement by Secretary of State confirming scheme construction will go ahead
January 2007	Construction commences
25th March 2009	Full opening of A69 Haydon Bridge bypass
July 2012	Publication of POPE One Year After (OYA) Report

Scheme Objectives

1.9 The primary objectives of the scheme were[1]:

- Improve safety for all road users in Haydon Bridge by removing through traffic and by providing a better standard of trunk road.
- Reduce congestion and delays along the A69.
- Ease the existing problems of community severance, noise and air pollution by improving the environment for residents, pedestrians and cyclists in Haydon Bridge.
- Provide an environmentally acceptable solution that minimises the impact on the built and natural environment.

Post Opening Project Evaluation

Highways England's Appraisal Process

1.10 Highways England is responsible for improving the strategic highway network (motorways and trunk roads) through the Major Schemes programme. At each key decision stage through the planning process, schemes are subject to a rigorous appraisal process to provide a justification for the project's continued development. When submitting a proposal for a major transport scheme, the Department for Transport (DfT) specifies that an Appraisal Summary Table (AST) is produced which records the degree to which five objectives[2] have been achieved. The AST for this scheme is presented in Chapter 7 of this report.

[1] The scheme objectives were sourced from the Highways England Non-Technical Summary of the Environmental Statement (June 2005).

[2] In recent years these have changed, but the evaluation of this scheme in this study will use those defined at the time of its appraisal, namely Environment, Safety, Economy, Accessibility and Integration.

Post Opening Project Evaluation

1.11 POPE studies are undertaken at two stages after all Major Schemes have opened: one year after scheme opening and five years after scheme opening. The purpose of POPE studies is to document outturn impacts, evaluate the strengths and weaknesses of the techniques used for appraising schemes so that informed improvements can be made to the appraisal process in the future. This is achieved by comparing information collected before and after the opening of the scheme to traffic, against predictions made during the planning process. The outturn impacts of a scheme are summarised in an Evaluation Summary Table (EST) which summarises the extent to which the objectives of a scheme have been achieved. The EST for this scheme can be found in Chapter 7of this report.

Summary of A69 Haydon Bridge One Year After (OYA) Opening Study

1.12 The purpose of this FYA study is to verify and study in more detail the emerging trends and conclusions presented in the OYA study report. The main conclusions made in the A69 Haydon Bridge OYA study report were as follows:

- At OYA it was found that three out of four scheme objectives had been achieved but it was too early to conclude whether safety had been improved for all road users in Haydon Bridge by removing through traffic.
- Following scheme opening, 80% (between 12,000 and 13,000 vehicles) of traffic had switched from the old A69 through Haydon Bridge onto the scheme, more than expected. Overall, traffic growth had been limited, with traffic flows in 2009 the same as 2005.
- Observed journey time savings for A69 through traffic were approximately 50 to 60 seconds, slightly lower than expected.
- There had been a slight decrease in collisions since scheme opening, with approximately 0.9 collisions a year saved. These results are contrary to the expected increase in collisions due to the addition of two new junctions at the east and west end of the scheme.
- Some additional safety benefits from the scheme were identified as users were able to cross the old A69 without needing to use the underpass.
- The combined benefits were lower than forecast but the scheme still achieved a Benefit Cost Ratio (BCR) of 1.5, representing medium value for money.
- Environmental mitigation measures had largely been put in place and were functioning adequately.
- At OYA, a resident survey was undertaken and overall the results were positive towards the scheme. This has not been repeated at FYA but where relevant, reference to the results has been made in the report.

1.13 This FYA report will reconsider the status of the above findings and provide further clarity on the longer term effects of the improvements on the immediate area affected by the scheme. This is of particular importance when considering collision and environmental impacts, and longer term economic regeneration effects.

Report Structure

1.14 The remainder of this report is structured as follows:

- Chapter 2 - Traffic Impact Evaluation
- Chapter 3 - Safety
- Chapter 4 - Economy
- Chapter 5 - Environment
- Chapter 6 – Accessibility and Integration
- Chapter 7 – Appraisal Summary Table and Evaluation Summary Table
- Chapter 8 – Conclusions

- Appendix A – Glossary
- Appendix B – Tables And Figures Listed in this report
- Appendix C – Environment Information Requested
- Appendix D – A69 Haydon Bridge Bypass OYA (Summer 2010) and FYA (Summer 2014) comparison photographs
- Appendix E – Comparison of ES photographs (June 2005), OYA photographs (Summer 2010) and FYA (Summer 2014)
- Appendix F – Haydon Bridge Conservation Area

2. Traffic Impact Evaluation

Introduction

2.1 This section examines traffic data from a number of sources to provide a before and after opening comparison of traffic flows and journey times along the old A69 through Haydon Bridge and the new A69 bypass. The same traffic flow and journey time analysis will also be undertaken on other routes within Haydon Bridge to understand the broader traffic impacts of the scheme. The purpose of this evaluation is to understand whether changes in traffic flows and journey times may be attributable to the scheme.

2.2 This chapter comprises:

- An evaluation of national, regional and local background traffic trends.
- A detailed comparison of before, OYA and FYA traffic flows on key routes in the study area likely to be affected by the scheme.
- A comparison of journey times for before scheme opening and FYA stages.
- An evaluation of key differences between forecast and outturn impacts of the scheme in terms of traffic flows and journey times.

Background Changes in Traffic

2.3 Historically in POPE scheme evaluations, the 'before' counts have often been factored to take account of background traffic growth so that they are directly comparable with the 'after' counts. This usually involves the use of National Road Traffic Forecasts (NRTF), with local adjustments made using Local Growth Factors if applicable.

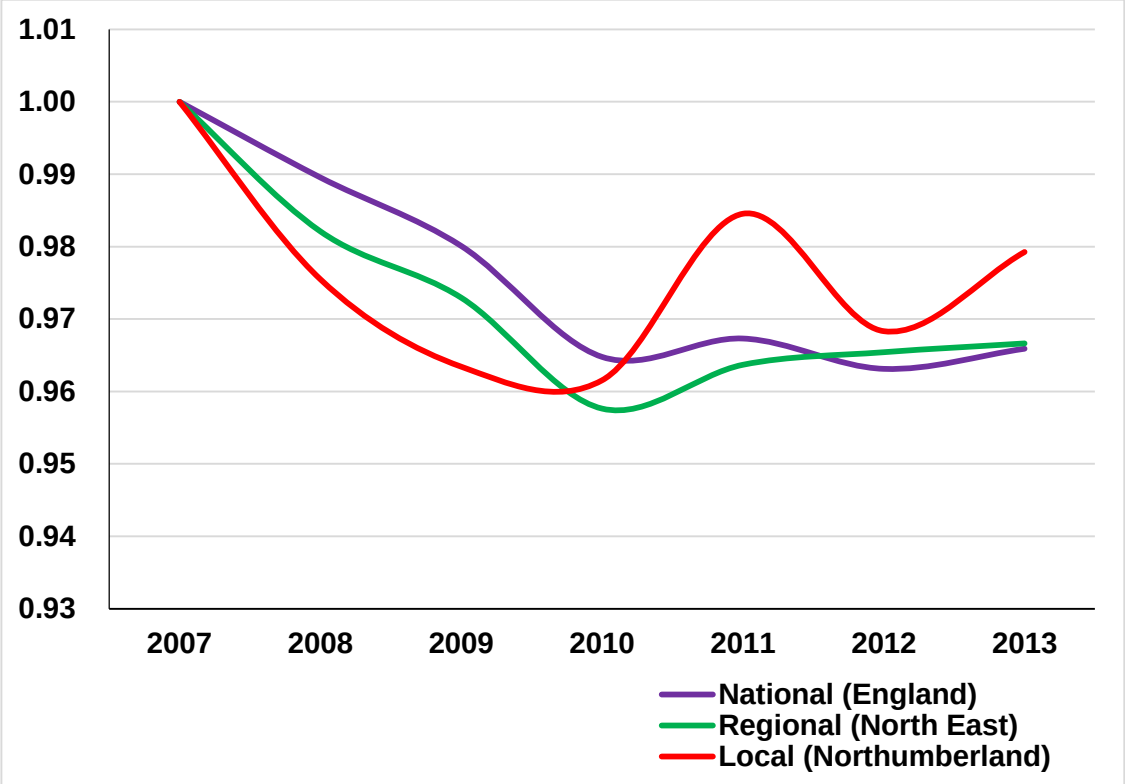
2.4 However, in light of the recent economic climate, and coinciding widespread reductions in motor vehicle travel in the United Kingdom (UK) as a whole since 2008, it is no longer deemed appropriate to use this method of factoring 'before' counts to reflect background changes in traffic. Rather, recent POPE studies have taken a more considered approach in order to assess changes in the vicinity of the scheme, within the context of national, regional and locally observed background changes in traffic.

Local, Regional and National Trends

2.5 The DfT produces observed annual statistics for all motor vehicles by local authority[3]. Data between 2007 (before construction) and 2013 (the latest available) is shown in million vehicle kilometres (mvkm) for Northumberland (local), the North East (regional), and England (national) in Figure 2.1.

[3] Motor vehicle traffic (vehicle kilometres) by region in Great Britain, annual from 1993 to 2013. Table TRA8904 (Department for Transport; accessed June 2014).

Figure 2.1 Local, Regional and National Trends in Million Vehicle Kilometres (mvkm)



2.6 Between 2007 and 2008 (before scheme opening), national, regional and local regional mvkm travelled decreased by 1% - 2%. In the scheme opening year (2009), mvkm travelled were approximately 3% to 4% lower than in 2007, coinciding with the economic recession.

2.7 From 2010 to 2011, mvkm travelled in Northumberland increased by approximately 2%. This was followed by a decrease between 2011 and 2012 and an increase between 2012 and 2013, when mvkm returned to a similar level as 2011. Whereas, national and regional mvkm travelled remained similar from 2010 to 2013. Overall, from 2007 to 2013, mvkm travelled in Northumberland, the North East and England decreased by approximately 3%.

Long Term Traffic Trends on the A69

2.8 In order to determine a greater understanding of the historical fluctuations in yearly traffic flows along the A69, Table 2.1 presents annual average weekday traffic (AAWT) flow data by direction for two sections of the A69, one west of the scheme area and another east of the scheme area.

Table 2.1 AAWT for A69, west and east of scheme area

Period	Year	A69, west of scheme area				A69, east of scheme area			
		Westbound		Eastbound		Westbound		Eastbound	
		AAWT	Factor of change on 2007	AAWT	Factor of change on 2007	AAWT	Factor of change on 2007	AAWT	Factor of change on 2007
Before Scheme Opening	2007	6,700	1.00	6,600	1.00	8,200	1.00	7,900	1.00
	2008	6,300	0.94	6,200	0.94	7,700	0.94	7,400	0.94
Scheme Opening Year	2009	6,500	0.97	6,300	0.96	7,800	0.95	7,500	0.95
After Scheme Opening	2010	6,500	0.97	6,300	0.96	7,800	0.95	7,500	0.95
	2011	6,400	0.95	6,300	0.95	7,700	0.94	7,500	0.95
	2012	6,400	0.95	6,300	0.95	7,600	0.93	7,400	0.94
	2013	6,400	0.96	6,300	0.96	7,700	0.94	7,500	0.95

2.9 From Table 2.1 it can be seen that overall between 2007 and 2013, AWT flows on the A69 have decreased by approximately 5%.

Conclusions on Background Changes in Traffic

2.10 From the analysis of background traffic changes, the DfT mvkm travelled data shows that there has been a 3% reduction in mvkm travelled nationally, regionally and locally over the time period covered in this report. Observed data for the A69 shows that traffic volumes have experienced a decrease of approximately 5% between 2007 and 2013. When reading this report it is therefore important to keep in mind that any decrease in vehicle flows of 5% or less may be attributed to the background reduction rather than the scheme itself.

Traffic Volume Analysis

Data Sources

2.11 This section uses a variety of data sources to inform the before and after analysis of changes in traffic volumes for the scheme. To complete this evaluation, data from before construction (June 2007), OYA opening (May/ July 2010) and FYA opening (May/ October 2014) is compared.

Traffic Count Data Sources

2.12 For the purpose of this evaluation study, the following sources of traffic data have been used:

- Permanent traffic count data obtained from the TRADS database[4] for count locations on the strategic network for before construction (June 2007), OYA (May 2010) and FYA (May 2014).
- Temporary Automatic Traffic Count (ATCs) data sites were commissioned in nine locations within the Haydon Bridge area, with two on the old A69, and the remainder on the wider road network for FYA.

2.13 The details of the traffic count data sites used in this evaluation are shown in Table 2.2 and their locations and observed average weekday traffic flows (AWT) are shown in Figure 2.2.

Table 2.2 Traffic Count Descriptions

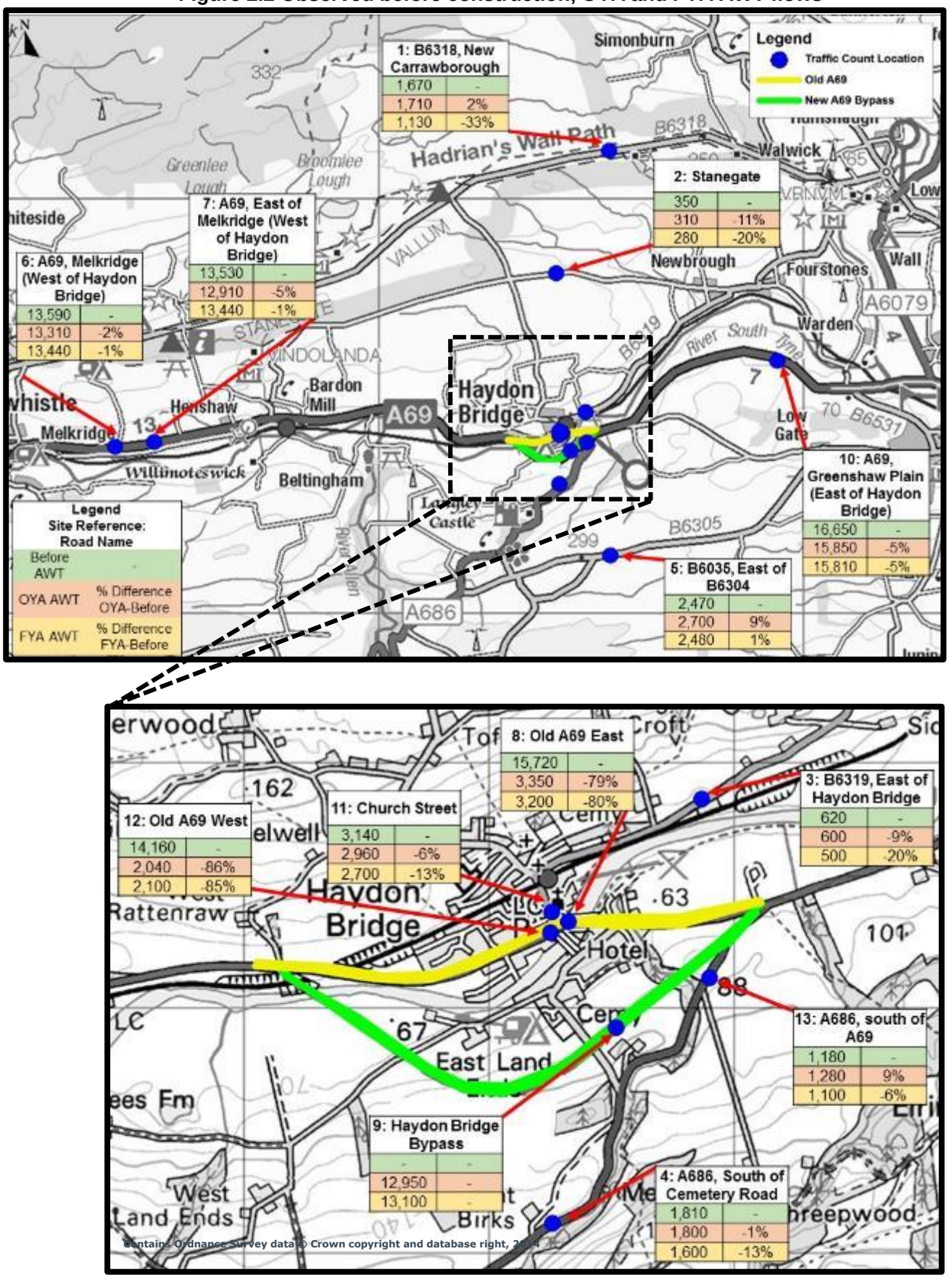
Source	Site Ref	Location
Commissioned Counts	1	B6318, Near Carrawborough
	2	Stanegate
	3	B6319, East of Haydon Bridge
	4	A686, South of Cemetery Road
	5	B6305, East of B6304
	8	Old A69, East of Church Street
	11	Church Street
	12	Old A69, West of Church Street
	13	A686, south of A69
TRADS	6	A69, Melkridge (West of Haydon Bridge)
	10	A69, Greenshaw Plain (East of Haydon Bridge)
	7	A69, East of Melkridge (West of Haydon Bridge)
	9	A69, Haydon Bridge Bypass

2.14 The classifications of Heavy Good Vehicles (HGVs) are not consistent between the before, OYA and FYA transport surveys, hence it has not been possible to undertake analysis of changes in HGV proportions since the scheme opened.

[4] The TRADS database contains traffic count data for count locations on the Highways England network.

Observed Flows

Figure 2.2 Observed before construction, OYA and FYA AWT flows



2.15 Figure 2.2 demonstrates that overall AWT flows have reduced in the Haydon Bridge area between before scheme opening and FYA periods at each of the following count sites:

- On the old A69 (Site 8 and 12), traffic flows have reduced by 80% to 85%, the equivalent of approximately 12,000 and 12,500 vehicles respectively. At FYA, 13,100 vehicles are travelling on the A69 bypass, suggesting traffic has successfully reassigned from the old A69 to the bypass.
- Traffic flows on the A686 (Site 4) have reduced by 200 vehicles (13%) and traffic on Church Street (Site 9) have reduced by approximately 400 vehicles (13%). These reductions do not represent a significant change considering the potential 5% background reduction.
- Aside from the A69 bypass, traffic volumes at each of the sites within Haydon Bridge have decreased slightly compared to that seen at OYA.

2.16 As shown in Figure 2.2, changes in traffic flows within the wider area vary:

- Traffic flows on the B6035 and A69 to the west of the bypass have remained virtually similar, whereas on the A69 to the east of the bypass, they have decreased by 5% (800 vehicles). This is in line with the general background reduction discussed previously in this chapter.
- Sites to the north of Haydon Bridge (Site 1, B6318 and Site 2, Stanegate) show the largest percentage reductions (33% and 20% respectively), the actual change in number of vehicles is small (70 and 550 vehicles respectively).

Screenline Analysis

2.17 In order to investigate any potential re-routing as a result of the scheme, screenline analysis has been undertaken using the screenlines identified in **Figure 2.3**. Traffic crossing screenlines represents vehicle movements across a wider corridor and can therefore better represent traffic flow changes than studying individual roads in isolation.

2.18 Two strategic screenlines have been selected for this study:

- **Screenline 1, East to west movement (Haydon Bridge):** Enables analysis of scheme impact on the corridor, consisting of the old and new A69.
- **Screenline 2, East to west movement (wider area):** Enables assessment of traffic movements across the wider east/west corridor.

Figure 2.3 Identification of Screenlines

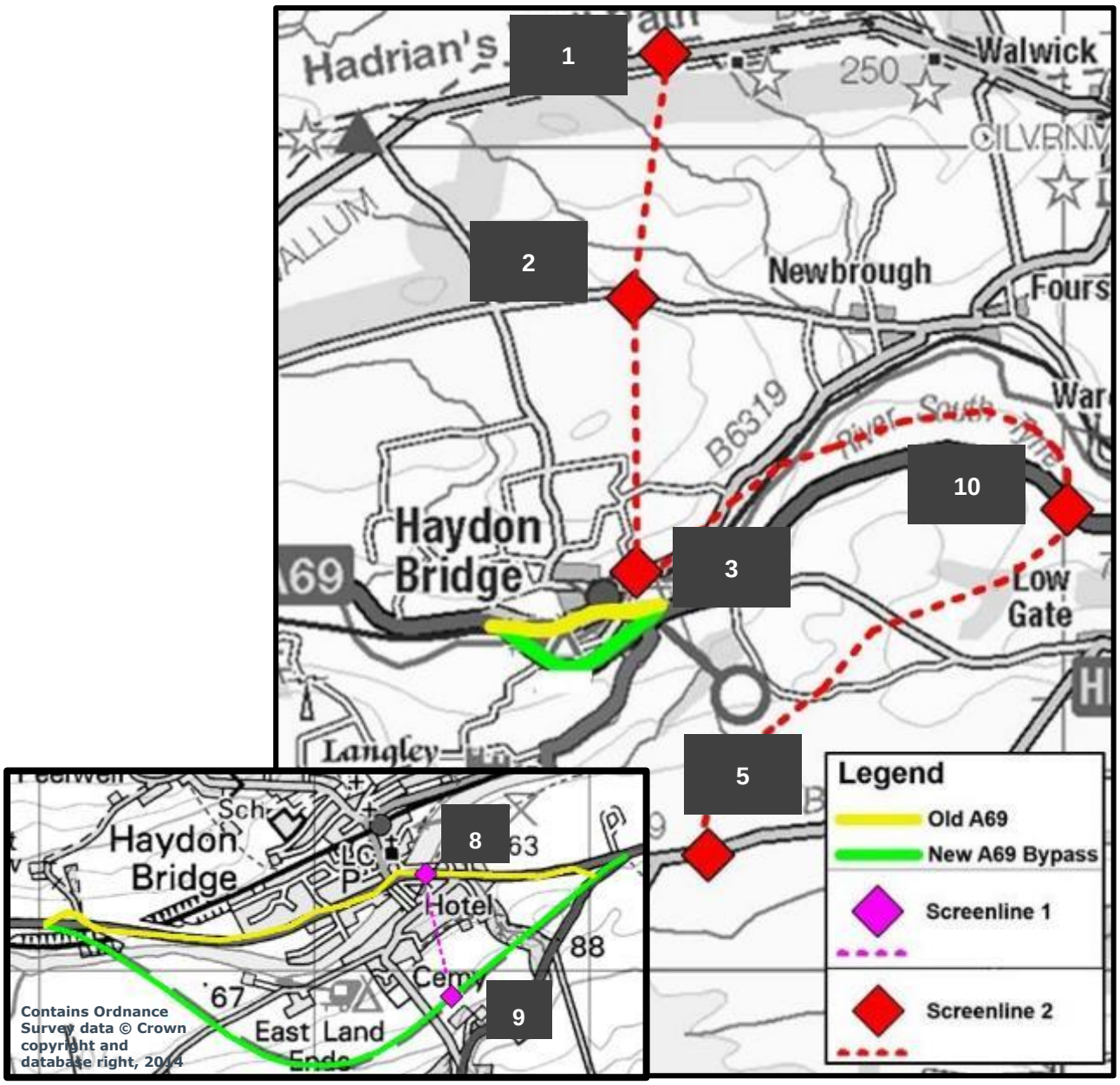


Table 2.3 Two Way Traffic Flows across Screenline

	Site Ref	Description	Two Way AWT Flow			
			Before (2007)	FYA (2014)	Difference	Percentage Difference
Screenline 1	8	Old A69, East	15,720	3,200	-12,520	-80%
	9	Haydon Bridge Bypass	-	13,110	+13,110	-
	Screenline Total		**15,720**	**16,310**	**590**	**4%**
Screenline 2	1	B6318, Near Carrowborough	1,670	1,130	-540	-33%
	2	Stanegate	350	280	-70	-20%
	3	B6319, East of Haydon Bridge	680	530	-150	-20%
	10	A69, Greenshaw Plain (East of Haydon Bridge)	16,650	15,810	-840	-5%
	5	B6035, East of B6304	2,470	2,480	+10	1%
	Screenline Total		**21,820**	**20,230**	**-1,590**	**-7%**

2.19 Table 2.3 provides a summary of traffic flows across the screenlines. Key points to note are:

- **Screenline 1: East to west movement (Haydon Bridge):**
  - Overall traffic flows across this screenline have increased by 4% (590 vehicles). This is likely to be an element of double counting of local movements, therefore traffic using the A69 corridor to travel from east to west and vice versa has not significantly changed since scheme opening.
  - The results show that traffic flows have decreased by 80% (12,520 vehicles) on the old A69. Traffic flows on the A69 bypass are 13,110 and therefore it can be assumed that traffic has successfully reassigned from the old A69 to the A69 bypass.
- **Screenline 2: East to west movements (wider area):**
  - Traffic flows across the screenline have reduced by 7% (1,590 vehicles) since the bypass opened. These results are only slightly more than the expected background reduction that has occurred on the A69 (Section 2.10), suggesting the scheme has not resulted in increased traffic in the wider area.

Forecast and Observed Traffic Impacts

Traffic Forecasting

2.20 The traffic forecasts for the scheme were produced in the Traffic Forecasting Report (TFR) (November 2004).

2.21 The appraisal used a base year of 2004 to predict traffic flows in an assumed opening year of 2009 and design year of 2024 for three traffic growth scenarios, ‘pessimistic’, ‘most likely’ and ‘optimistic’. This was achieved through the use of SATURN modelling software, TEMPRO (Trip End Model Programme) and NRTF (National Road Traffic Forecasts).

Variable Demand Modelling

2.22 The viability of using Variable Demand Modelling (VDM) was assessed using WebTAG guidance. The assessment found that VDM was not required as, in line with WebTAG guidance[5], the following conditions applied to the scheme:

- The scheme was small in scale (2.91km) and was comprised of a relatively minor improvement in standard on a road which is predominantly used by long distance traffic.
- Extra traffic induced by the scheme was unlikely to reduce time saving benefits generated by the scheme.
- The scheme would have no appreciable impact on competition between private and public transport.

Demand Matrices

2.23 As a result of the reasons discussed in Section 2.22, fixed trip matrices were used in the traffic assessment of the scheme. The base year matrices for 2004 were obtained by applying factors to a previously built 2002 base year matrices. TEMPRO and NRTF were used to produce estimates of future traffic levels; the whole North East data set was used due to a high proportion of traffic on the A69 being long distance trips.

Forecast Considerations

2.24 The Forecasting Report stated that there were no major developments in the region that were expected to significantly affect traffic levels and this has shown to be the case in the observed data. Information acquired at OYA identified two housing developments (consisting of approximately 50 houses each) in Haydon Bridge, Innerhaugh Mews (slightly west of Traffic Count 8 on the old A69) and The Showfield (off Cemetery Road). These developments were not accounted for in the Forecasting Report and they may have generated a small amount of additional traffic in Haydon Bridge.

Geographical Coverage

2.25 The modelled area covers the route through Haydon Bridge, the A69 bypass and a short section of the A686 to the south of the scheme. The only changes made between the Do Minimum (DM) scenario (without scheme) and Do Something (DS) scenario (with scheme) between the base and design year were the bypass scheme itself.

Forecast vs. Observed DM and DS Traffic Flows

2.26 This section will compare predicted central (most likely) growth flows given in the Forecasting Report for both the DM and DS scenarios with observed flow data collected as part of this evaluation. It must be noted that these traffic flow forecasts are different to those reported in the Environment chapter, which are high growth forecasts.

2.27 Table 2.4 compares predicted and observed DM flows and Table 2.5 compares predicted and observed DS flows. Where possible, Annual Average Daily Traffic (AADT) observed flows on the have been used in order to make a direct comparison with the AADT Forecasts. As ATC surveys were undertaken for the duration of a week, it has only been possible to compare Average Daily Traffic (ADT) at particular locations to the AADT forecasts. The figures presented in Table 2.4 and Table 2.5 do therefore not match the observed flows presented earlier in this chapter, which were average weekday traffic (AWT) flows.

Do Minimum Scenario

2.28 The forecast flows for the DM scenario and the observed before scheme construction flows[6] on the old A69, the A69 bypass and other links in and around Haydon Bridge are shown in Table 2.4.

[5] TAG Unit 3.10.1

[6] *Factored flows based on local observed factors.

Table 2.4 Forecast and observed flows for the Do Minimum Scenario

Site Ref	Description	Two Way ADT/AADT Flow			
		Forecast (2007)	Observed (2007)	Difference	Percentage Difference
4	A686, South of Cemetery Road	2,000	1,780	-220	-11%
8	Old A69, East	14,700	15,720	+1,020	+7%
11	Church Street	3,000	3,000*	+0	0%
12	Old A69, West	13,200	13,600*	+400	+3%
13	A686, south of A69	1,300	1,100*	-200	-15%

2.29 From Table 2.4, it can be seen that overall forecast traffic flows are accurate, with observed traffic flows different from forecast by between 3 and 7% on the old A69 prior to the scheme construction. Observed flows on the A686 pre scheme were between 11% and 15% lower than forecast.

Do Something Scenario

2.30 A comparison of the DS forecast traffic flows (for 2014 estimated using straight line interpolation between forecasts for 2009 and 2024) and those observed on the old A69, the A69 bypass and other links in and around Haydon Bridge are provided in Table 2.5.

Table 2.5 Forecast and Observed Flows for the Do Something Scenario

Site Ref	Description	Two Way ADT/AADT Flow			
		Forecast (2014)	Observed (2014)	Difference	Percentage Difference
4	A686, South of Cemetery Road	2,300	1,800	-500	-22%
8	Old A69, East	4,300	2,990	-1,310	-30%
11	Church Street	2,000	2,490	+490	+25%
12	Old A69, West	2,600	1,980	-620	-24%
13	A686, south of A69	3,400	1,100	-2,300	-67%
9	**Haydon Bridge Bypass**	**12,000**	**12,460**	**+460**	**+4%**

2.31 From Table 2.4 and Table 2.5 it can be determined that traffic flows on the old A69 were forecast to decrease by between 70% and 80% following scheme opening. Observed traffic flows between 2007 and 2014 have decreased but by more than predicted, with observed flows on the old A69 between 80% and 85% lower than forecast.

2.32 Observed traffic flows on the scheme are 4% higher than predicted and the forecasts are therefore considered accurate. Given the background traffic reduction of up to 5%, this suggests that more traffic than predicted has reassigned to the bypass.

2.33 At FYA, the observed flows on the old A69 are 24% (620 vehicles) to 30% (1,310 vehicles) lower than forecast. The lower than forecast observed DS flows could be due to a combination of the background reduction, a slightly higher number of vehicles than expected reassigning to the bypass and an overall growth rate below that expected.

2.34 DM forecasts for the A686 were higher than observed, which is carried through to the DS forecasts/post scheme observed flows. It is noted however that the forecasts expected traffic to transfer from Cemetery Road onto the A686 to take advantage of the new junction with the bypass. This has clearly not occurred, and suggests that a combination of lower than expected traffic

growth, and an overestimate of local traffic in the area has resulted in forecasts being inaccurate at this location.

2.35 Forecasting assumptions would have presumed continued growth in traffic, however, with the exception of the bypass, observed flows are lower than forecast. This could be partly attributed to the economic recession, but as macro-economic conditions improve, traffic flows can be expected to rise and so the results presented may not be representative of the long term trends in traffic flows in the area.

Journey Time Analysis

Scheme Objective: Reduce congestion and delays along the A69

2.36 One of the main objectives of this scheme was noted to be to reduce congestion and delays. Limited detail is available regarding the baseline issues of congestion, with the AST just noting that reliability would be improved due to a reduction of local traffic and pedestrian movements interacting with traffic. Journey time analysis has been undertaken to understand the impact of the scheme on journey times along the scheme section and A69. As shown in the traffic analysis section, after scheme opening, traffic flows on the old A69 have reduced by 80% - 85%. The following section comprises of:

- **Wider network analysis:** Comparison of journey times for the route extending from Bardon Mill to the west to east of Haydon Bridge, including the old A69 for before scheme opening and A69 bypass FYA opening.
- **Scheme only analysis:** Comparison of journey times for the old A69, before scheme opening and A69 bypass FYA opening.
- A comparison of forecast and observed FYA journey times on the old A69 and A69 bypass.

2.37 It should be noted that there has been no change to the speed limit (30mph) along the old A69 since scheme opening. Before scheme opening, the old A69 allowed traffic to travel through/ into the village without turning, however, the bypass has introduced two tie-in junctions with the old A69, which could have an impact on journey times as vehicle travelling along the A69 now have to turn to enter Haydon Bridge. The speed limit on the bypass is higher than the old A69 at 60mph, however, the route is slightly longer.

Journey Time Sources

2.38 Journey time data was collected using the moving observer method before scheme construction (June 2007) and using satellite navigation data[7] for five years after opening (July 2013 – June 2014), with the intention of discovering how the scheme has affected times along the improved route itself. The before journey time data was collected after construction had already started, however, no online works had taken place at this time so traffic was unaffected, and therefore the before data is representative of conditions before scheme implementation.

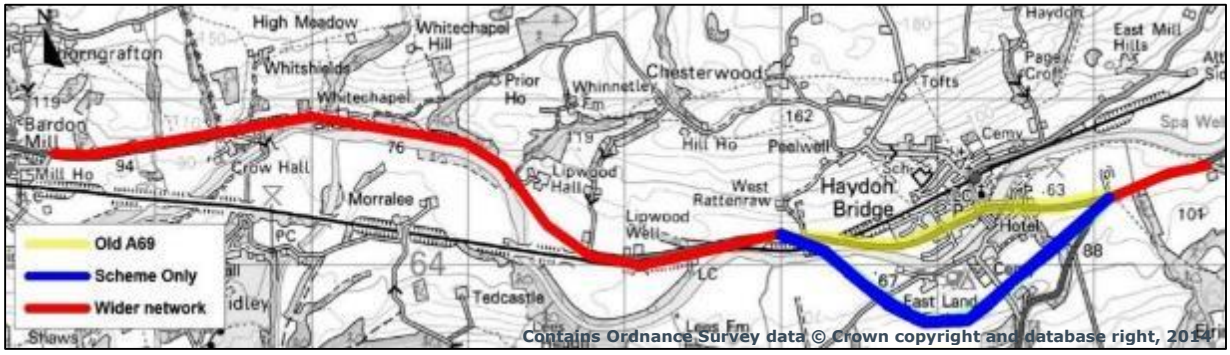
2.39 Journey times for the routes shown in Figure 2.4 were collected for the following periods for weekdays for both before scheme construction and FYA:

- Morning peak (07:30 – 09:00)
- Interpeak (10:00 – 15:00)
- Evening peak (16:30 – 18:00)

[7] Motorists who use satellite navigation devices have the option to voluntarily allow anonymous data about their journeys to be collected and used to provide a range of services, including the analysis of historic journey times along specific routes.

2.40 Journey time data has not been collected for the old A69 at FYA as at OYA journey times along the old road had been relatively unaffected by the opening of the bypass, suggesting that journey times on the old road were limited by the built up village environment and speed limits rather than any congestion caused by traffic along the route.

Figure 2.4 Journey Time Routes



Journey Time Results

2.41 Table 2.6 and Table 2.7 compare journey times for the scheme section and wider route for before scheme opening (including old A69) and for after scheme opening (including the A69 bypass).

Table 2.6 Observed Journey Times Before and After Scheme Opening (scheme only)

Time Period	Direction	Before (mm:ss) Old A69	FYA (mm:ss) A69 bypass	Difference (mm:ss)	Difference (percentage)
AM (07.30 - 09.00)	Eastbound	02:40	01:55	-00:45	-28%
	Westbound	02:15	01:50	-00:25	-19%
Interpeak (10.00 – 15.00)	Eastbound	02:21	01:56	-00:25	-18%
	Westbound	02:17	01:53	-00:24	-18%
PM (16.30 - 18.00)	Eastbound	02:31	01:54	-00:37	-25%
	Westbound	02:12	01:50	-00:22	-17%

Table 2.7 Observed Journey Times Before and After Scheme Opening (wider route)

Time Period	Direction	Before (mm:ss)	FYA (mm:ss)	Difference (mm:ss)	Difference (percentage)
AM (07.30 - 09.00)	Eastbound	07:00	06:08	-00:52	-12%
	Westbound	06:30	06:02	-00:28	-7%
Interpeak (10.00 – 15.00)	Eastbound	06:54	06:18	-00:36	-9%
	Westbound	06:42	06:15	-00:27	-7%
PM (16.30 - 18.00)	Eastbound	06:54	06:08	-00:46	-11%
	Westbound	06:29	06:04	-00:25	-6%

2.42 The results show that the majority of journey time savings when travelling from the east to west and vice versa of Haydon Bridge can be attributed to the scheme section. The key points to note are:

- Travelling along the A69 bypass takes between 22 (17%) and 45 (28%) seconds less than the old A69 through Haydon Bridge. Across all time periods, journey times on the A69 bypass are below 2 minutes.
- The greatest journey time savings occur in the eastbound direction during the AM peak (45 seconds) and PM peak (37 seconds).

- Reductions in journey times are highest in the eastbound direction in the AM peak. Interrogation of hourly flows shows that flows are somewhat tidal, with more traffic travelling towards Newcastle (eastbound) in the AM peak and away from Newcastle (westbound) in the PM peak. However, this does not fully account for the higher journey time pre scheme for eastbound traffic. The higher journey times on the old A69 in the eastbound direction pre scheme may have been partly due to high numbers of local traffic movements joining the strategic traffic in a short period of time.

2.43 Reducing congestion and delays along the A69 was one of the scheme's objectives. Before scheme opening, journey time variability on the old A69 and the wider route was relatively consistent across the day based on observed data included in this report, suggesting congestion and delays in and around Haydon Bridge were not an issue. Following scheme opening, journey times have improved but reliability remains similar to before scheme opening and therefore, the scheme is considered not to have improved journey time reliability.

2.44 It has not been possible to undertake further analysis of journey time variability through the use of standard deviation calculations due to the use of different data sources for before-scheme (moving-observer) and post-scheme (satellite navigation) periods. Given that journey times on the old A69 were generally consistent throughout the day before scheme opening, it appears that delays and congestion were not an issue in the village. It can therefore be assumed that day to day journey time variability has not particularly improved as a result of the scheme.

Forecast vs. Observed Journey Times

2.45 Forecast journey times have been extracted from the scheme's COBA model for the 'Most Likely' scenario. These have been compared with observed journey times obtained from moving observer (old A69) and the satellite navigation data (scheme) detailed in Section 2.38 and have been adjusted to match the COBA area (as shown in Figure 3.1). Forecast and observed journey times have been compared for both the interpeak and peak periods over three routes; old route before (DM), old route after (DS) and new route after (DS) as shown in Table 2.8.

Table 2.8 Forecast and Observed Journey Times for DM and DS Scenarios (mm:ss)

Time Period	Interpeak		Difference	Peak		Difference
	Forecast	Observed		Forecast	Observed	
Old A69 (DM)	03:14	02:50	**-00:24**	03:31	02:52	**-00:39**
Old A69 (DS)	03:20	03:07	**-00:13**	03:29	03:05	**-00:24**
A69 Bypass (DS)	02:11	02:02	**-00:09**	02:13	02:00	**-00:13**
Old A69 difference	**+0:06**	**+00:17**		**-00:02**	**+00:13**	
Difference between old A69 and bypass	**-01:03**	**-00:48**		**-01:18**	**-00:52**	

2.46 Forecast journey times have been extracted from the scheme's COBA model for the 'Most Likely' scenario. These have been compared with observed journey times obtained from moving observer (old A69) and the satellite navigation data (scheme) detailed in Section 2.38 and have been adjusted to match the COBA area (as shown in Figure 3.1). Forecast and observed journey times have been compared for both the interpeak and peak periods over three routes; old route before (DM), old route after (DS) and new route after (DS) as shown in Table 2.8.

2.47 Table 2.8 the following observations can be made:

- Observed journey times before and after scheme opening on the old A69 are lower than forecast in the interpeak and peak periods. In the DM scenario, the interpeak and peak period journey times are lower than forecast by 36 seconds and 21 seconds respectively. In the DS scenario, observed journey times are also slightly lower than forecast by 13 seconds in the interpeak period and 24 seconds in the peak period.
- Observed journey times on the bypass are very accurate, with observed journey times between 9 and 13 seconds lower than forecast.
- The observed journey time savings on the bypass are lower than forecast. The forecasts expected that travelling from the east to west of Haydon Bridge using the

scheme would take just over one minute less than using the old A69 (without scheme). The observed journey times show that using the bypass to make the journey takes between 48 and 52 seconds less than using the old A69 (without scheme), but it is noted that the DM forecast times for the old route were higher than observed pre scheme.

- Forecasts showed that journey times on the old A69 would experience very little change following scheme opening, despite the reduction in traffic. This could be due to the addition of the two tie-in junctions as there have been no other changes to the route. Observed journey times are in line with forecasts.

Journey Time Reliability

Background

2.48 WebTAG guidance uses the measurement of route stress as an appropriate proxy for measuring the reliability sub-objective, with the concept of stress development to provide an indication of the relationship between road volume and capacity. Route stress is the ratio of AADT flow to the Congestion Reference Flow (CRF), which is a definition of capacity[8]. Reliability of journey times reduce as flows approach capacity.

Forecast

2.49 The AST forecast a large beneficial impact on reliability, although no numerical route stress calculation was conducted.

Observed Route Stress

2.50 Route stress statistics have been calculated for before and after scheme opening as shown in Table 2.9. WebTAG states that where stress values are less than 75% or greater than 125%, values of 75% and 125%, respectively, should be used. However, to demonstrate the extent of the changes in route stress due to the scheme, Table 2.9 includes the unadjusted route stress.

Table 2.9 Calculation of Route Stress

Calculated Outturn Stress			
Before scheme opening (Old A69)		FYA scheme opening (A69 Bypass)	
Unadjusted	**Adjusted**	**Unadjusted**	**Adjusted**
53%	75%	30%	75%

2.51 Table 2.9 shows that the unadjusted route stress has decreased from 53% to 30%, however, before scheme route stress was low indicating that journeys were reliable. The unadjusted post-opening percentage is however lower than before scheme opening and can be attributed to the old A69 being constrained by the built up village environment, 30mph speed limit and pedestrians crossings and numerous access points. Whereas in comparison the bypass is free flowing with a 60mph speed limit and no pedestrian crossings and access points along the route.

2.52 Following WebTAG guidance, route stress must be assessed based on the adjusted route stress percentage, therefore there has been no change in route stress between the before and after scheme opening periods.

2.53 It must be noted that before scheme opening, journey time variability on the old A69 was already low and after scheme opening, variability on the bypass is also low. Whilst data is not available for quantitative assessment of reliability, the journey time results suggest that travelling through

[8] The CRF of a link is an estimate of the Annual Average Daily Traffic (AADT) flow at which the carriageway is likely to be 'congested' in the peak periods on an average day.

Haydon Bridge using the bypass takes up to 45 seconds less during peak periods than using the old A69 (without scheme), but overall journey time reliability has not changed since scheme opening.

2.54 As a result, the impact of the scheme on the reliability sub-objective is ‘neutral’, worse than forecast.

Key Points – Traffic

Traffic Flows

- Since the scheme opened, weekday traffic flows on the old A69 have reduced by around 12,000 (approximately 80%) and 13,000 vehicles are using the scheme.
- Traffic flow changes in the wider area since the scheme opened vary. On the B6035 and A69 (west of the bypass), traffic flows have remained relatively constant when accounting for the potential background reduction. Contrary to this, on the B6318 (north of Haydon Bridge) and road to Stanegate, traffic flows have reduced by 33% and 20%.
- Traffic using the corridor has not changed since the scheme opened.

Traffic Forecasts

- Traffic flows were forecast to decrease by between 74% and 82% on the old A69 following scheme opening, however, observed traffic flows have decreased by 80% to 85% respectively.
- The number of vehicles using the new bypass is 4% higher than forecast.
- Observed traffic flows on the A686 are between 21% and 46% lower than forecast, and on Church Street, 27% lower. The forecasts would have assumed continuous growth, however, the economic recession may have had an impact, leading to lower than forecast observed flows.

Journey Times

- Travelling through Haydon Bridge from the wider area using the bypass takes up to 52 seconds less in the eastbound direction and 30 seconds less in the westbound direction compared to using the old A69 before scheme opening.
- Forecast journey times for traffic using the bypass are accurate, and are mainly due to the increase in speed limit for strategic traffic.
- Journey time variability on the old A69 before the scheme opened was low and whilst journey times on the bypass are lower, variability remains low.

Reliability

- Following WebTAG guidance, there has been no change in journey time reliability since the scheme opened. However, before scheme opening, journey times were consistent on the old A69 and following scheme opening, journey times remain consistent on the bypass. As such, the impact of the scheme on the reliability sub-objective is **'neutral'**, worse than expected.

3. Safety Evaluation

Introduction

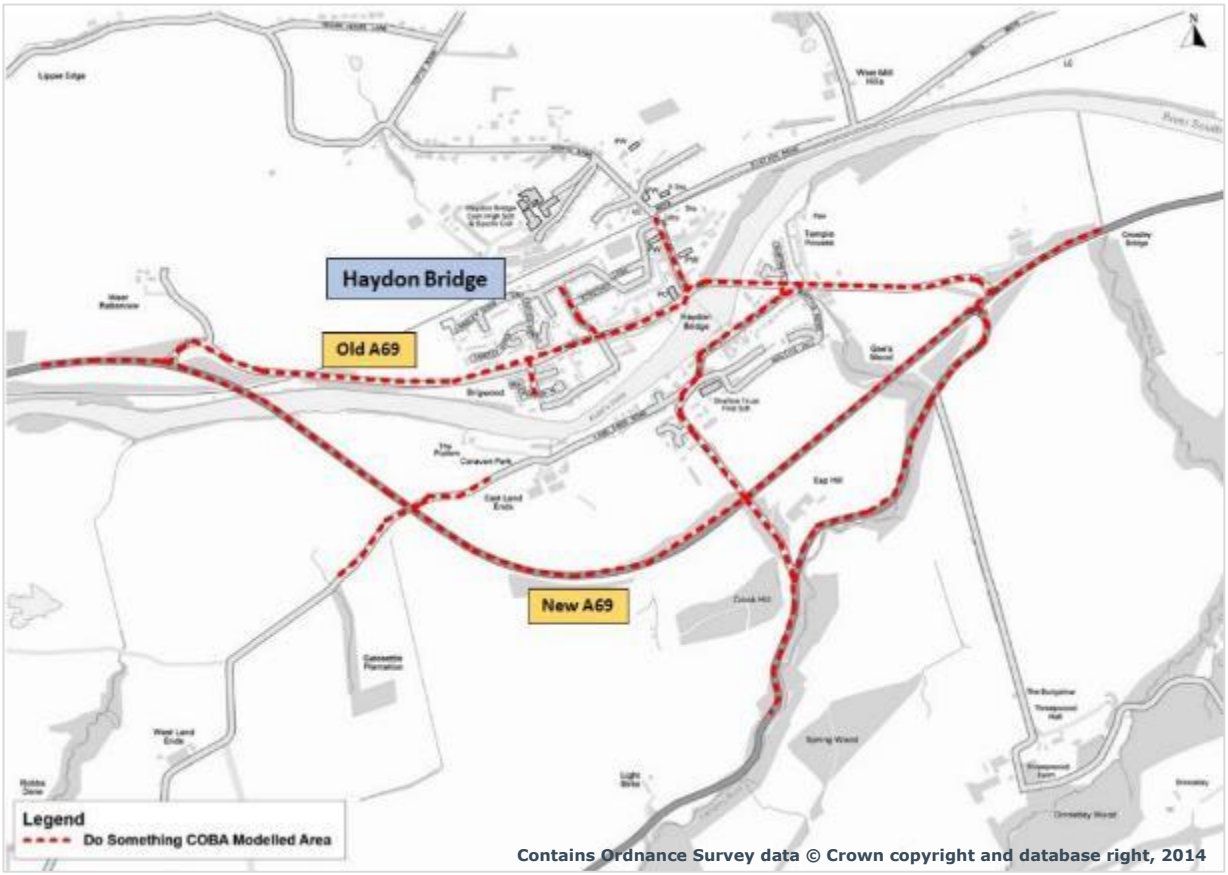
3.1 This chapter examines the impact of the scheme on safety. The DfT's objectives for transport set out the principle objectives to reduce collisions and improve security. This includes reducing the loss of life, injuries and damage resulting from transport collisions and crime.

3.2 In order to assess the scheme's impact on collisions, this chapter of the report analyses changes in Personal Injury Collision (PICs) occurring in the five year period before and after scheme opening. Evaluation of the scheme's impact on personal security has also been undertaken through the use of observations made during a site visit and comments received during the environmental consultation.

3.3 The safety analysis in this report covers the geographical area included in the Cost Benefit Analysis (COBA) model area, as shown in Figure 3.1.The area covered by the COBA model consisted of the scheme itself and part of the A686 and some minor roads within Haydon Bridge. The AST stated that:

'The bypass will result in a small decrease in link based accidents, however this is outweighed by an increase in junction based accidents at the proposed tie-in junction at each end of the bypass, coupled with a low observed junction accident rate at present'.

Figure 3.1 Collision Analysis Area



Data Sources

Forecast Data

3.4 The forecast safety benefits for the A69 Haydon Bridge bypass scheme have been derived from the COBA scheme model, which predicted safety benefits for the opening year and throughout a

sixty year appraisal period. Local collision rates were used to overwrite the COBA defaults based on observed data covering the period from 1999 to 2003.

3.5 The forecast impact on safety is expressed in terms of numbers of PICs expected to be saved over the appraisal period with a corresponding monetary impact. For this scheme a small increase in collisions was forecast due to the addition of junctions at either end of the bypass. Forecasts of the economic / monetary impact of the forecast change in collisions are evaluated in Chapter 4.

Observed Data

3.6 Collision and casualty data has been obtained from Northumberland County Council (NCC) for the following date periods:

- Before opening: 1St January 2002 – 31st December 2006
- Construction: 1st January 2007 – 28th February 2009
- After opening: 1st April 2009 – 31st March 2014

3.7 The collision data is based on the records of PICs (i.e. collisions that may involve injuries to one or more persons) recorded in the STATS19 data collected by the police when attending collisions. Collisions that do not result in injury are not included in this dataset and are thus not considered in this evaluation.

3.8 At this stage, the collision data may have not yet been validated by the DfT. The requirement for up to date data and site specific information necessitated the use of invalidated data, sourced from Northumberland County Council. Thus the data is judged to be sufficiently robust for use in this study, but it may be subject to change. However it is not anticipated that this would be significant in terms of the analysis of collisions numbers presented in this report.

Background Changes in Collision Reduction

3.9 It is widely recognised that for over a decade there has been a year-on-year reduction in the numbers of personal injury collisions on roads, even against a trend of increasing traffic volumes during much of the same period. The reasons for the reduction are considered to be multi-factorial and include improved safety measures in vehicles and reduced numbers of younger drivers. This background trend needs to be considered when examining the changes in collision numbers. If the scheme had not been built, collision numbers in the area may still have been influenced by wider trends and reduced.

3.10 When comparing the numbers of collisions and casualties in this area before and after the scheme was built and associated net change with the scheme, the background reduction needs to be taken account of. The best way to do this is to assume that, if the scheme had not been built, the number of collisions and resulting casualties on the roads in the COBA area for the scheme would have dropped at the same rate as they did nationally during the same period. This gives a counterfactual 'without scheme' scenario on a like for like basis with the observed post opening data, which is the 'with scheme' scenario.

3.11 The comparison needed is between the middle year in the after period and the middle of the pre-construction period. As such, the middle year of the pre-construction period is 2004 and the middle year of the after period, 2011. The approach is to use national data to calculate changes in the number of collisions in this period occurring on rural 'A roads', which broadly represents the old A69 before scheme opening.

3.12 Figure 3.2 illustrates the changes in collision numbers by road type between 2004 and 2011 and Figure 3.3 shows the change in casualty numbers by road type during the same period.

3.13 The difference between the numbers of collisions in these two scenarios can then be attributed to the scheme rather than wider national trends. The result will inform the calculation of monetised safety benefits achieved by the scheme as discussed in the economy chapter of this report.

Figure 3.2 Trends in Injury Collision Numbers

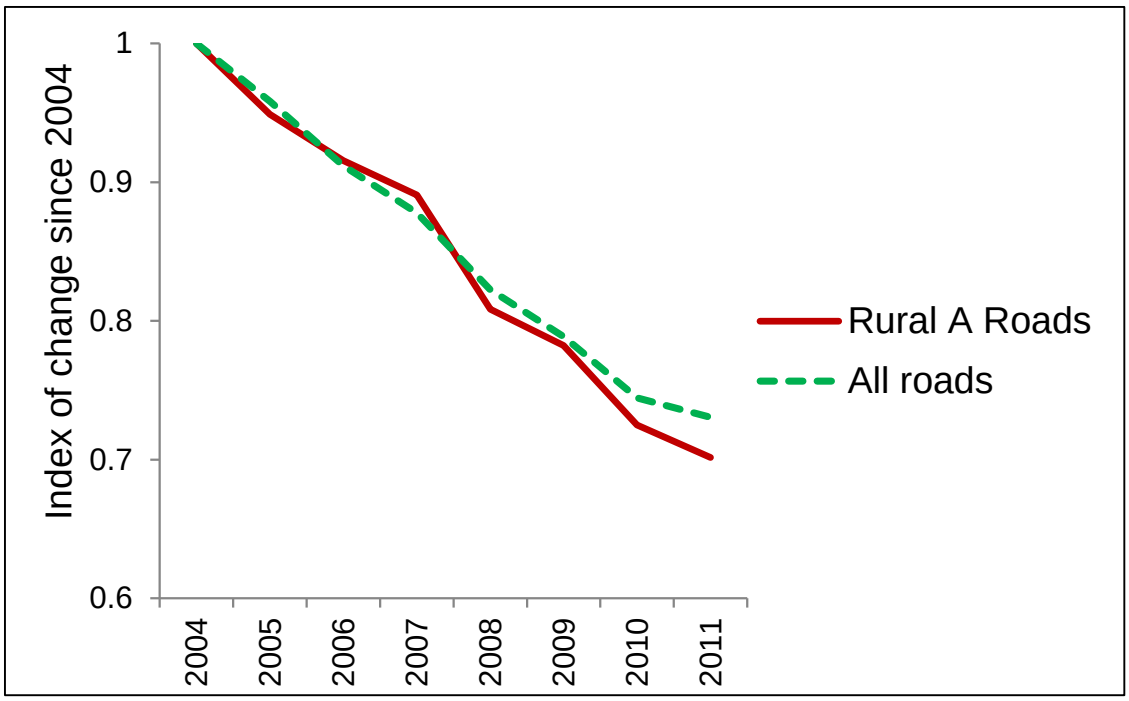
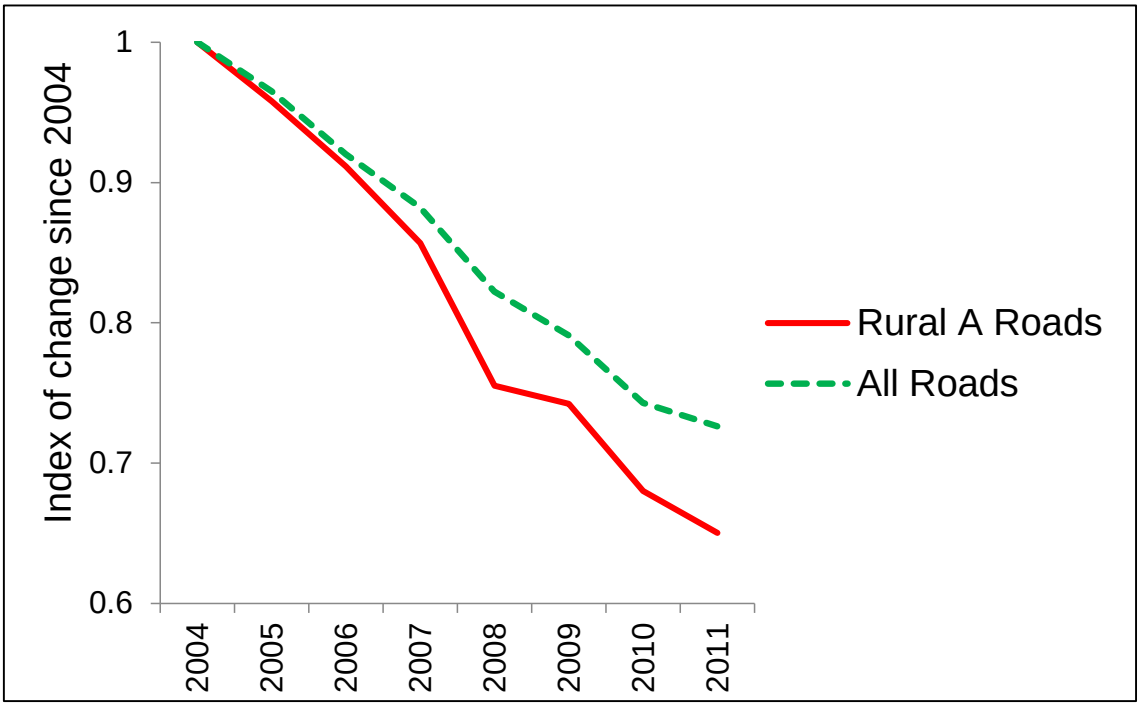


Figure 3.3 Trends in Casualty Numbers



Collision Numbers

3.14 This section analyses observed changes in the number of PICs following the implementation of the scheme. This includes investigating the changes in the number of collisions and associated casualties as well as if there has been a reduction in the relative severity of collisions.

Collisions – COBA modelled area

3.15 The evaluation of before and after opening collision numbers has been undertaken for the COBA modelled area. Table 3.1 compares the observed without scheme counterfactual number of collisions which is an alteration based on the counterfactual scenario, and the observed with scheme collisions.

Table 3.1 Number of Collisions by Severity in the COBA Area

Time Period	Date		Number of Collisions				Annual Average				Severity Index
	From	To	Fatal	Serious	Slight	Total	Fatal	Serious	Slight	All	
Before Scheme Opening	Jan 2002	Dec 2002	0	0	6	6	0.2	0.2	3.2	3.6	11%
	Jan 2003	Dec 2003	0	0	1	1					
	Jan 2004	Dec 2004	0	1	3	4					
	Jan 2005	Dec 2005	0	0	2	2					
	Jan 2006	Dec 2006	1	0	4	5					
Without scheme counterfactual										**2.5**	-
Construction Period	Jan 2007	Dec 2007	0	0	6	6	0	0	4.2	4.2	0%
	Jan 2008	Dec 2008	0	0	3	3					
	Jan 2009	Feb 2009	0	0	0	0					
After Scheme Opening	Apr 2009	Mar 2010	0	0	4	4	0	0	2.2	2.2	0%
	Apr 2010	Mar 2011	0	0	1	1					
	Apr 2011	Mar 2012	0	0	2	2					
	Apr 2012	Mar 2013	0	0	4	4					
	Apr 2013	Mar 2014	0	0	0	0					
Total collision Saving										**0.3**	-

3.16 The results presented in Table 3.1 show:

- The without scheme counterfactual collision rate (accounting for the background reduction in collisions over time) is calculated as 2.5 collisions per annum. Comparing this with the post-opening collision rate represents a negligible collision decrease of 0.3 PICs per annum. Statistical significance testing (Section 3.18 provides further details) found the collision benefit to not significant in that it could have occurred without the scheme.
- The average annual number of PICs occurring within the COBA modelled area has reduced by 39% from 3.6 to 2.2 following scheme opening, equating to an average decrease of 1.4 collisions per annum.
- The severity index has decreased from 11% to 0%, hence there have been no fatal or serious collision since the scheme opened. Collisions of slight severity have reduced by 31% between the before and after scheme opening periods and there have been no collisions between April 2013 and March 2014.

Casualties

3.17 The number of people injured in the collisions shown in Table 3.2 has been analysed and the annual average number of casualties is shown for the before and after scheme opening periods in Table 3.2.

Table 3.2 Number of Casualties by Severity in the COBA Area

Time Period	Date		Number of Casualties				Annual Average				Severity Index
	From	To	Fatal	Serious	Slight	Total	Fatal	Serious	Slight	All	
Before Scheme Opening	Jan 2002	Dec 2002	0	1	5	6	0.2	0.6	4.6	5.4	15%
	Jan 2003	Dec 2003	0	0	1	1					
	Jan 2004	Dec 2004	0	1	3	4					
	Jan 2005	Dec 2005	0	0	2	2					
	Jan 2006	Dec 2006	1	1	12	14					
Without scheme counterfactual										**3.5**	-
Construction Period	Jan 2007	Dec 2007	0	0	6	6	0	0	8.8	8.8	0%
	Jan 2008	Dec 2008	0	0	3	3					
	Jan 2009	Feb 2009	0	0	0	0					
After Scheme Opening	Apr 2009	Mar 2010	0	0	4	4	0	0	3.2	3.2	0%
	Apr 2010	Mar 2011	0	0	1	1					
	Apr 2011	Mar 2012	0	0	2	2					
	Apr 2012	Mar 2013	0	0	4	4					
	Apr 2013	Mar 2014	0	0	0	0					
Total casualty Saving										**0.3**	-

3.18 The key points regarding casualty numbers are:

- The without scheme counterfactual casualty rate (accounting for the background reduction in collisions over time) is calculated as 3.5 casualties per annum. Comparing this with the post-opening collision rate represents a negligible casualty decrease of 0.3 casualties per annum. Statistical significance testing (Section 3.18 provides further details) found the slight casualty reduction to be not significant in that it is unlikely to have occurred as a result of the scheme.
- The average annual number of casualties has reduced from 5.4 to 3.2 following scheme opening, equating to an average decrease of 2.2 casualties per annum. This 41% reduction is in line with the reduction in collisions in the COBA modelled area.
- Overall the average casualty severity index has decreased from 15% to 0%, hence there have been no people fatally or seriously injured since the scheme opened. Collisions of slight severity have reduced by 30% between the before and after scheme opening periods.
- In line with no collisions occurring between April 2013 and March 2014, there have been no casualties during the same period.
- There has been no change to the number of Non-Motorised User (NMU) casualties since the scheme opened.

Statistical Significance

3.19 In order to determine whether the changes in collision numbers observed before and after the scheme opened are statistically significant, a Chi-square test has been undertaken for the COBA modelled area. This test uses the without scheme counterfactual and post-opening number of collisions and casualties to establish whether the changes are significant and related to the scheme, or are likely to have occurred by chance.

3.20 The results found that the change in collision rate and casualty numbers for the COBA area is not significant and are unlikely to have occurred due to the scheme.

Collision Locations

3.21 The location of collisions occurring within the Haydon Bridge COBA modelled area for the before scheme opening period are shown in Figure 3.4 and Figure 3.5 identifies the collisions during the after scheme opening period.

Figure 3.4 Location of collisions before scheme opening

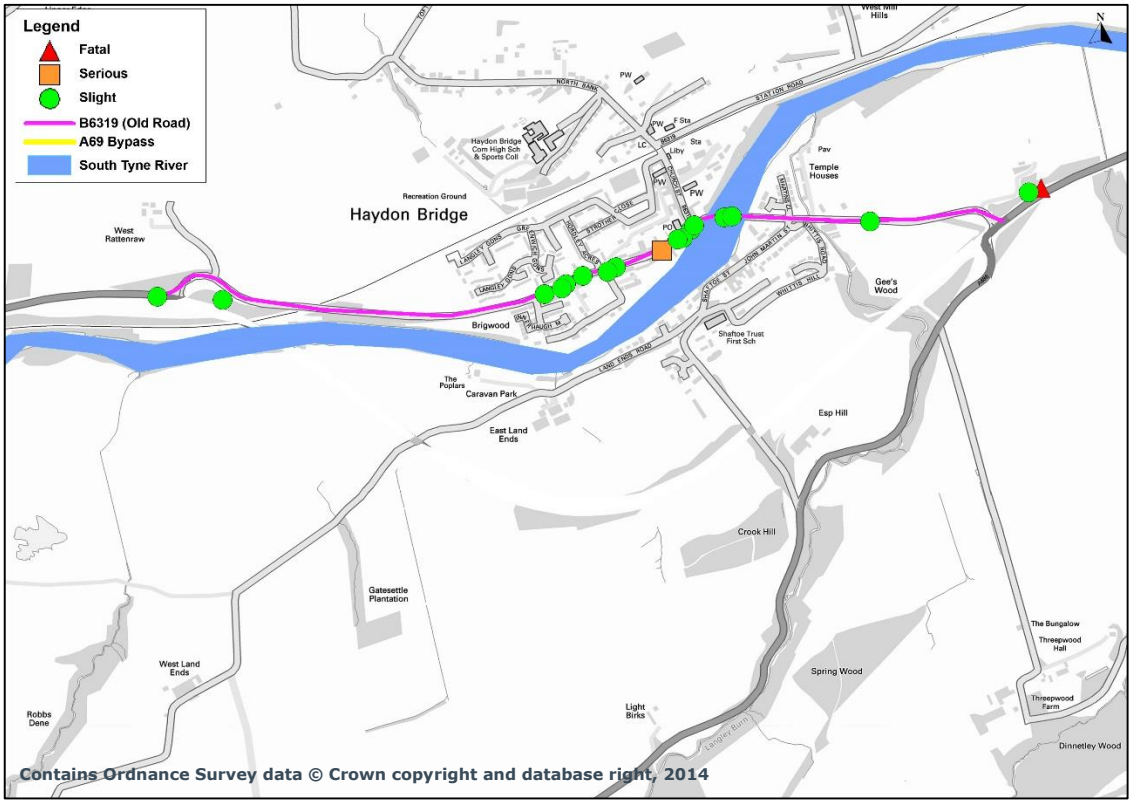
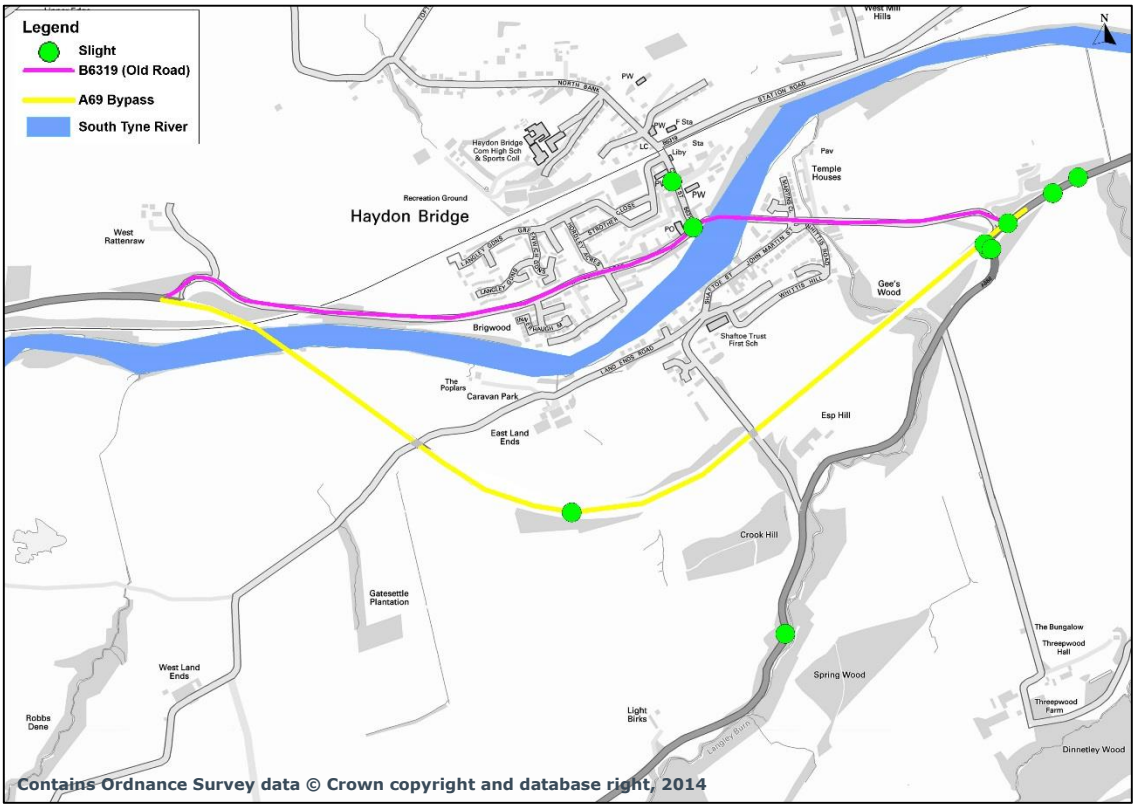


Figure 3.5 Location of collisions after scheme opening



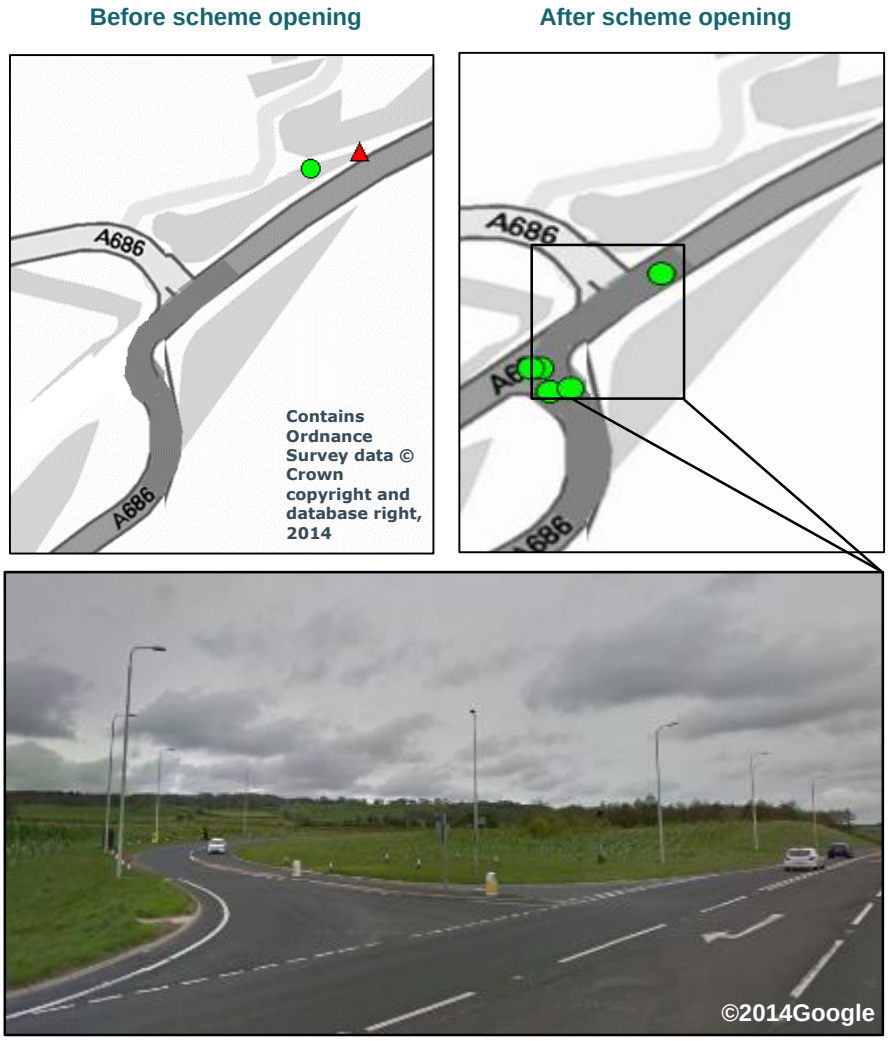
3.22 Observations of collision locations shows that in the after scheme opening periods there are fewer collisions on the old A69, particularly in Haydon Bridge at Church Street junction. This could be attributed to lower traffic flows, as 12,000 less vehicles travel on the old A69 since the scheme opened.

3.23 Overall, the locations of collisions has adjusted, with the dominant location of collisions following scheme opening at the junction to the east of the new A69, whereas before scheme opening the majority of collisions were in Haydon Bridge at the old A69 and Church Street junction. This indicates that the removal of the majority of traffic from the village has improved safety.

3.24 Collision numbers at the location of the new A69 east junction have increased following scheme opening, which is potentially due to the addition of a new junction to accommodate the new route. Contrary to this, there have been no collisions in the location of the western junction following scheme opening.

3.25 As noted in the AST, the forecast collision increase is attributed to the provision of two new junctions at each end of the bypass. The locations of collisions at the junction to the east of the new bypass and a view of the junction looking south (image taken in 2012) are shown in Figure 3.6.

Figure 3.6 East Junction - Location of Collisions



3.26 As shown in Figure 3.6, the number of collisions at the east junction has increased since scheme opening, with a number of collisions occurring on the A686 at the location shown in the image.

3.27 Causation factors have not been made available to POPE, however, the collision descriptions show the following:

- Two collisions occurred due to a vehicle travelling north on the A686 turning right onto the A69 eastbound into oncoming traffic travelling east.

- There was one rear shunt collision caused by a vehicle failing to slow for a vehicle turning right onto the A686 from the A69 eastbound.
- A vehicle travelling north on the A686 fails to give way at the junction with the A69 and collides with traffic on the A69.
- A vehicle travelling on the A69 westbound turns left onto the A686 at speed and collides with another vehicle travelling north on the A686.

3.28 These descriptions show that turning movements at the junction are the common cause for collisions, particularly movements from the A686 northbound onto the A69 eastbound and from the A69 eastbound to the A686 southbound. The Parish Council have expressed concerns over the safety of the eastern junction, particularly when undertaking the following manoeuvres:

- **A69 westbound to A686 southbound:** Traffic travelling on the A69 westbound and slowing to turn left onto the A686 are often overtaken (by using the eastbound lane) by vehicles travelling behind.
- **A686 northbound to A69 eastbound:** To avoid crossing westbound traffic, local traffic is using the A686 and travelling through Haydon Bridge to access the A69 eastbound.

3.29 It was reported at OYA that, as a result of safety concerns, lighting (see Figure 3.6) was installed at the eastern junction and this was a change to the scheme appraised in the original Environmental Statement. At OYA, there had been no collisions at the junction, but the resident survey found residents were concerned about accessing the bypass from Haydon Bridge. At FYA a number of collisions have occurred, suggesting that the additional lighting has not contributed to improving safety at the junction.

Road Safety Audit (RSA) Stage 4

3.30 The Road Safety Audit (March 2011) found two recorded injury collisions had occurred based on 12 months of data, one at the western junction and the other on the A69 main carriageway, but no common cause factors or trends could be identified. The Audit stated that the collisions were down to possible human failings and not deficiencies in the new road and as a result, remedial measures were not proposed at the 12 month post opening audit stage. No 36 month RSA has been made available to POPE for use in this report.

Forecast vs. Observed Collision Savings

3.31 This section compares the number of observed collisions with those forecast in the COBA model. For the observed collisions, the DM figures are based on the annual average of five years of data before scheme construction, whilst the DS figures are based on five years of post-opening data.

Collision Forecasts

3.32 A comparison of the COBA modelled area forecast and observed collisions in the opening year is presented in Table 3.3.

Table 3.3 Comparison of Opening Year Forecast and Observed Collisions in the COBA Area

COBA Area Forecast (Opening Year Forecast)	Do-Minimum (without scheme)	4.7
	Do-Something (with scheme)	4.9
	Saving	**-0.2**
	% change	**4%**
COBA Area Observed	Before Opening	3.6
	Counterfactual Do-Minimum (without scheme)	2.5
	After Opening	2.2
	Saving	**0.3**
	% Change	**-12%**

3.33 Table 3.3 shows that the COBA forecast an increase of 0.2 PICs in the opening year, an increase of 4% from the DM scenario. From the observed collisions, it can be seen that a negligible collision

saving has been achieved, with 0.3 PICs saved since the scheme opened, equating to a 12% decrease from the DM scenario, although this is not statistically significant.

Collision Rates

3.34 The number of collisions along a length of road together with its AADT can be used to calculate a collision rate (calculated as number of collisions per million vehicle kilometres). By looking at the rate it is possible to identify the impact of the roads of interest whilst ignoring the impact of the change in traffic volumes.

3.35 Table 3.4 compares the observed and predicted collision rate on links and junctions combined for both the DM scenario (old A69 only) and DS scenario (A69 bypass and old A69). The observed rate for the DM is the without scheme counterfactual rate.

Table 3.4 Collisions Rate on the old A69 and bypass (PICs/mvkm)

	Do Minimum		Difference between Forecast and Observed	Do Something		Difference between Forecast and Observed	Difference between DM and DS
	COBA Default/Predicted	Observed		COBA Default/Predicted	Observed		
Haydon Bridge	0.79	0.87	+0.08	0.70	0.42	-0.28	**0.45 (-48%)**
Haydon Bridge Bypass	N/A			0.21	1.08	+0.87	**N/A**

3.36 From Table 3.4 it can be seen that before scheme opening, the collision rate was marginally higher than predicted (+0.08 PICs/mvkm) and after scheme opening the collision rate is 0.28 PICs/mvkm below the forecast. The DS collision rate in Haydon Bridge is 0.42 PICS/mvkm, lower than the 0.70 PICs/mvkm predicted.

3.37 Following scheme opening the observed collision rate on the old A69 has decreased by 0.45 PICs/mvkm (48%) when compared to the without scheme counterfactual rate. Due to the significant reduction in traffic on the old A69, the reduced collision rate is expected.

3.38 The collision rate on the scheme length is 1.08 PICs/mvkm, which is higher than the expected 0.21 PICs/mvkm.

3.39 Since OYA, there have been no further collisions within Haydon Bridge and overall collision numbers in the village are low, whereas, a number of collisions have occurred at the eastern junction. The low observed collision rate in the village and high collision rate on the bypass demonstrate that since the scheme opened safety has improved in the village but safety at the eastern junction remains an issue.

Fatalities and Weighted Injuries

3.40 The collision rate discussed previously and shown in Table 3.4 does not take into account the severity of collisions. To analyse this, the Fatalities and Weighted Injuries (FWI) metric which is a combined measure of casualties based on the number of fatal, serious and slight casualties is presented. The FWI for the five years before and five years after opening periods are shown in Table 3.5. To take into account the increased traffic on the A69 and for comparison with other scheme, billion vehicle kilometres (bvkm) are also presented. It should however be noted that these figures do not take account for background reductions in casualties or collisions.

Table 3.5 FWI on the old A69 and scheme

	FWI/collision	FWI/year	FWI/bvkm
Before (old A69)	0.046	0.05	3.8
After (A69 Bypass)	0.016	0.04	3.4

3.41 From Table 3.5 it can be seen that each of the FWI metrics have reduced following scheme opening, indicating that the seriousness of injuries has reduced significantly despite overall flows on the new bypass being slightly higher than those on the old A69.

Personal Security

3.42 The aim of this sub-objective is to reflect both changes in security and the likely number of users affected. In terms of roads, security includes the perception of risk from personal injury, damage to or theft of vehicles, and theft of property for individuals or from vehicles in the following areas:

- On the road itself (e.g. being attached whilst broken down).
- In service areas, carp parks and so on (e.g. vehicle damaged while parked at a service stations, being attached whilst walking to a parked car).
- At junctions (e.g. smash and grab incidents while queuing at lights).

3.43 The primary indicators for personal security on roads include:

- Surveillance
- Landscaping
- Lighting and visibility
- Emergency call facilities
- Cyclists and pedestrian facilities

Forecast

3.44 The scheme appraisal scored personal security as 'neutral', stating that:

> *'Drivers will transfer from an urban route, where they may be vulnerable to crime during congestion etc. to a rural route, where they may be vulnerable to crime during breakdowns due to lack of road lighting'*

3.45 The appraisal predicted that 12,698 users would be affected.

FYA Evaluation

3.46 There has been no change to the primary indicators for personal security since scheme opening and the details within the AST are upheld in that drivers on the bypass no longer pass through an urban area.

3.47 In addition, the resident survey undertaken at OYA found that residents believed the scheme had improved safety for vehicles, pedestrians and cyclists due to a reduction in traffic and traffic speeds in Haydon Bridge.

3.48 As a result of the above, the impact of the scheme on personal security is **'neutral'**, **in line with the AST.**

Key Points - Safety

Collisions

- Once national background trends are accounted for, following scheme opening, collision numbers in Haydon Bridge and on the scheme have remained relatively similar, reducing collisions by 0.3 per year, the equivalent of 12%. This negligible reduction is, however, not statistically significant and may have occurred without the scheme.
- There are safety concerns at the eastern junction. Evaluation of collision locations has identified a cluster at this location and this is supported by comments received from the Parish Council.
- In accounting for national background trends for casualties, casualty numbers have decreased by 0.3 per annum since the scheme opened, but statistical tests show that this is not statistically signification and is unlikely to have been caused by the scheme.
- The collision rate in Haydon Bridge (old A69) has decreased from 0.87 counterfactual PICs/mvkm before scheme opening to 0.42 PICs/mvkm.
- The observed collision rate on the scheme section is 1.08 PICs/mvkm, mainly as a result of thehigh number of collisions which have occurred at the new junction to the east of the scheme.
- The collision severity has reduced from 15% before scheme opening to 0% following scheme opening.

Forecast vs. Observed Collision Savings

- The COBA model forecast a collision increase of 4% (0.2 PICs/annum) between the DM and DS scenarios, however, a collision reduction of 12% (0.3 PICs/annum) has been achieved following scheme opening.
- Observed collision rates demonstrate that the COBA model underestimated the annual collision rate for the scheme, with the forecast collision rate 0.21 PICs/mvkm.
- The COBA model was accurate for the DM scenario, with a collision rate of 0.79 PICs/mvkm predicted and a collision rate of 0.87 PICs/mvkm was observed.
- Observed collision rates (0.42 PICs/mvkm) on the old A69 are significantly lower than predicted (0.80 PICs/mvkm).

Personal Security

- The transfer of traffic away from an urban area with informal surveillance is balanced with the reduction of traffic through the village making crossing the old A69 safer and reduces the need to use the underpass. Overall, the impact of the scheme is assessed as neutral, as expected.

4. Economy

Introduction

4.1 The purpose of this chapter is to evaluate how the scheme is performing against the economy objective, including the following sub-objectives:

- Achieve good value for money in relation to impacts on public accounts.
- Improve Transport Economic Efficiency (TEE) for business users, transport provide and consumer users.
- Improve journey reliability (which has been considered in Chapter 2).
- Provide beneficial wider economic impacts.

4.2 A COBA model was used to undertake evaluation of TEE and safety benefits of the scheme and QUADRO (Queues and Delays at Roadworks) was used to model the economic impacts of construction of the scheme.

4.3 This section provides a comparison between the outturn costs and benefits and the forecast economic impacts, as well as considering the wider economic impacts of the scheme. Outturn journey time and safety economic impacts are based upon the observed results reported in Chapters 2 and 3.

Sources

4.4 The COBA model (January 2005) and following documents have been utilised to inform the post opening evaluation of the scheme benefits:

- Economic Assessment Report (February 2005)
- Traffic Forecasting Report (November 2004)
- Outturn Costs from Regional Finance Manager (RFM) (December 2014)

4.5 The reports provide an original appraisal forecast for a 60 year appraisal period based on a 2009 opening year. All costs presented in the COBA are for the most likely scenario and in 2002 prices discounted to 2002 unless otherwise stated.

Forecast Benefits

A summary of the predicted scheme monetised impacts is shown in Table 4.1Table 4.3. This shows that over the 60 year appraisal period the scheme was expected to generate in excess of £45.5 million benefits, with the majority arising from journey time savings. Table 4.1 includes a summary of the benefits which have been calculated as part of this post opening evaluation and those which have not been evaluated and have been assumed as forecast.

4.6 A green tick indicates that the element of benefits is considered as part of this evaluation. A red cross indicates that the forecast impact from the appraisal will be used in place of a full evaluation at this stage.

Table 4.1 Economic Impact of Scheme

Benefit Stream	Predicted Benefits		Evaluation	
	£	%	Evaluate?	Reasons
Journey Times	£32.9m	72.2%	✓	Represents a considerable proportion of the overall scheme benefits Outturn journey time impacts in opening year can be calculated with relative ease.
Vehicle Operating Costs	-£0.06m	-0.1%	✗	Small proportion of overall scheme impact, hence outturn is assumed as forecast.
Safety	-£3.7m	-8.1%	✗	Outturn safety impact was found to be not significant so is has not been monetised at this stage.
Construction Delay and Maintenance	£16.4m	36%	✗	Evaluation is outside of the realms of POPE, therefore outturn is assumed as forecast.
Total	**£45.5m**	**100%**		

Investment Costs

4.7 This section compares the forecast cost of the scheme with the outturn cost. Scheme costs include the cost to Highways England of constructing the scheme and purchasing land.

4.8 Forecast costs are taken from the Economic Assessment Report (February 2005). The outturn cost (obtained from the HA (at time of request) Regional Finance Manager) presented in Table 4.2 includes the cost of the scheme as of December 2014.

Table 4.2 Summary of Investment Cost (2002 prices)

Forecast Cost	Outturn Cost	Difference
£24.9m	£32.5m	+£7.6m (31%)

Note: these are 2002 prices not discounted

4.9 Table 4.2 shows the outturn cost for the A69 Haydon Bridge is £32.5 million, 31% higher than forecast. It is understood from the scheme project manager that the increase in construction costs was caused by earthworks taking longer than expected due to inclement weather.

Present Value Costs (PVC)

4.10 Cost benefit analysis of a major scheme requires all the costs to be considered for the whole of the appraisal period and they need to be expressed on a like-for-like basis with the benefits. This basis is termed Present Value. Present Value is the value today of an amount of money in the future. In cost-benefit analysis, values in differing years are converted to a standard base year by the process of discounting giving a present value.

4.11 At the time of appraisal, the impact of indirect tax was included as part of the costs, and as such is presented here within the costs section. However, current appraisal guidance includes the impact of indirect tax as part of the benefits of a scheme; therefore both methods are presented later in this section when calculating the Benefit Cost Ratio (BCR).

4.12 The full PVC for this scheme at the time of appraisal comprised the following costs converted to present value:

- Investment Costs
- Operating Costs; and
- Impact on Indirect Tax revenues during the scheme life.

Investment Costs in Present Value

4.13 The investment cost of the scheme has been calculated by taking the DS scheme costs minus the DM scheme cost, which is the normal process for calculating this. A comparison of all forecast and outturn costs is presented in Table 4.3.

Table 4.3 Investment Costs in Present Value

Costs in £m 2002 market prices, discounted	Forecast	FYA Outturn Impacts
Investment Cost	£19.4m	£32.6m
Operating Cost	-£1.01m	-£1.01m
Total	**£18.4m**	**£31.3m**

Indirect Tax (present value)

4.14 Indirect tax revenue impact is the expected change in indirect tax revenue to the Government due to changes in the transport sector as a result of the scheme over the appraisal period. At the appraisal stage, the impact of the scheme on indirect taxation was calculated as part of the costs using COBA.

4.15 For this study, the indirect tax impact is derived primarily from the monetisation of the forecast change in fuel consumption over the 60 year appraisal period due to vehicles travelling faster (more fuel inefficient speeds) on the bypass and further as the bypass is slightly longer than the old A69.

4.16 As indirect tax is a significantly low proportion of the overall TEE benefits, the FYA outturn impact is assumed as forecast. The results for the scheme are shown in Table 4.4.

Table 4.4 Summary of Indirect Taxation Impact (60 years)

2002 market prices discounted to 2002	Forecast	FYA (Assumed as forecast)
Indirect Tax Generated by the Scheme	£0.08m	£0.08m

Present Value Benefits

Transport Economic Efficiency

Journey Time Benefits

4.17 The POPE method of evaluating the economic value of the benefits derived from vehicle hour savings is based upon comparing the observed vehicle hour savings, combined with the assumption that the observed vehicle hour saving at the FYA stage can be taken as indicative of that over the remainder 60 year appraisal period. Based on this assumption, comparing the forecast

vehicle hour saving with the observed vehicle hour saving enables the calculation of the 60 year outturn monetised benefit.

4.18 In order to establish the proportion of vehicle hours saved compared to the forecast, it was necessary to calculate the observed vehicle hours saved per annum based on the FYA journey times and traffic flows. This was done using a 'saving per vehicle' approach.

4.19 Forecast vehicle hour savings have been calculated from the COBA model for the same links.

4.20 A ratio approach has been used to calculate the journey time monetary benefit by calculating the outturn vehicle hour saving as a proportion of the forecast vehicle hour saving. This proportion has then been applied to the forecast 60 year monetary benefits to generate the reforecast monetary benefit. The journey time benefits are shown in Table 4.5.

Table 4.5 Forecast vs. Outturn reforecast Journey Time Benefit

£m 2002 prices, discounted	Vehicle Hour Saving	60 Year Monetary Benefit	% Difference
Forecast	57,000	£32.9m	**-34%**
Reforecast based on FYA Outturn Impacts	37,900	£21.9m	

4.21 The results show that the outturn journey time benefit is £21.9m, which is 34% lower than forecast. This can be attributed to lower than forecast journey time savings on the bypass as shown previously in Table 2.8.

Vehicle Operating Costs

4.22 WebTAG guidance states that the use of the road system by private cars and lorries gives rise to operating costs for the user. These are fuel and non-fuel costs, where fuel is the majority net cost impact of conventional highways schemes. The EAR states that the increase in VOC is due to increased fuel consumption by vehicles travelling faster and further on the bypass. In the case of this scheme, the forecast changes in Vehicle Operating Costs (VOC) are minor and do not have a considerable impact on the overall TEE benefits.

4.23 For this reason, the reforecast VOC benefits are as forecast. The VOC results are shown in Table 4.6.

Table 4.6 Summary of Vehicle Operating Costs Benefit

Present Value Benefits (£m 2002 prices, discounted)	Forecast	Reforecast
Vehicle Operating Cost (VOC)	-£0.06m	-£0.06m

Safety Benefits

Forecast Benefits

4.24 The evaluation of outturn monetised safety benefits is based on the forecast 60 year appraisal period safety benefits and the comparison between the forecast and observed collision saving in the opening year. The economic impact of changes in safety is calculated by assigning monetary benefits to the predicted reduction in the number and severity of personal injury collisions over the appraisal period.

4.25 Although one of the scheme objectives was to reduce collisions in the village of Haydon Bridge, overall the scheme predicted an increase in collisions due to the new eastern and western junctions. The scheme was predicted to generate a £3.7m dis-benefit over the 60 year appraisal period.

Outturn Benefits

4.26 Section 3.15 demonstrates that the annual average number of collisions has decreased by 0.3 and statistical significance tests show that this was likely to have occurred by chance alone, rather than due to the scheme opening. As there is no evidence to suggest the scheme has resulted in a change in safety impact, the outturn safety benefit has been assumed to be £0 million.

Construction Delay and Maintenance Benefits

4.27 The DfT's QUADRO program was used to estimate the economic impact of the scheme on road users in terms of journey times and operating costs during the construction phase and future maintenance. The QUADRO forecast a total monetary construction delay and maintenance benefit of £16.4 million, comprising of a £0.83 million dis-benefit for construction delay and £17.2 million maintenance benefit.

4.28 The Economic Assessment Report details that the maintenance benefit arises from the old A69 becoming available for a viable diversion route and the construction delay is caused by the delays associated with linking of the eastern and western junctions to the existing road.

4.29 During construction it would be expected that some additional traffic delays would occur. It is not possible to undertake an evaluation of the monetary impact of construction as this would have required traffic surveys to be undertaken during periods of roadworks, which is outside the scope of POPE. This report has therefore not undertaken any further evaluation of construction delay.

4.30 However, during periods of maintenance on the bypass, the old A69 would provide a viable diversion route, thus reducing delays to journey times during period of maintenance. This report therefore assumes as forecast (£16.4 million) for future construction delay and maintenance benefits.

Summary of Present Value Benefits

4.31 A comparison of all forecast and outturn benefits, as discussed in previous sections, is presented in Table 4.7. The total benefits include the assessment of PVB inclusive of VOC, but excluding indirect tax, as was the approach for the original appraisal.

4.32 The results show that the reforecast total PVB for the scheme is £38.2 million, 16% lower than forecast at the appraisal stage. The main reason for the difference is due to the journey time savings on the bypass being lower than forecast as previously shown in Table 2.8.

Table 4.7 Summary of Present Value Benefits (60 years)

Benefit	Forecast	Reforecast based on FYA Outturn Impact
Journey Time Benefits	£32.9m	£21.9m
Vehicle Operating Cost (VOC) Benefits	-£0.06m	-£0.06m
Future Maintenance Benefits	£16.4m	£16.4m
Safety Benefits	-£3.7m	£0m
Total PVB	**£45.5m**	**£38.2m**

Benefit Cost Ratio (BCR)

4.33 The benefit-cost ratio (BCR) is an indicator used in the cost-benefit analysis of a road scheme that attempts to summarise the overall value for money of a project or proposal. The BCR is the ratio of the benefits of a project or proposal, expressed in monetary terms, relative to its costs, also expressed in monetary terms. All benefits and costs are expressed in present values. Projects with a BCR greater than 1 have greater benefits than costs, thus providing positive net benefits.

4.34 At the time of scheme appraisal, Treasury guidance was to include indirect tax impact as part of the cost. However, the most recent guidance on indirect tax impacts recommends that it is included as part of the benefit. This means that when a scheme such as this which leads to increased fuel consumption and hence increases indirect tax revenue, the PVB is increased rather than the PVC being decreased.

4.35 Table 4.8 shows the calculation of the BCR using the costs and benefits presented earlier in this chapter, with consideration made for indirect tax impact as both a benefit and cost.

Table 4.8 Forecast vs. Outturn Reforecast Benefit Cost Ratio

All monetary figures in 2002 prices and values		Forecast	Re-Forecast based on FYA Outturn Impacts
Indirect Tax as a Cost	PVB	£45.5m	£38.2m
	PVC	£18.3m	£31.2m
	BCR	**2.5**	**1.2**
Indirect Tax as a Benefit	PVB	£45.6m	£38.3m
	PVC	£18.4m	£31.3m
	BCR	**2.5**	**1.2**

4.36 The forecast and reforecast indirect tax are comparatively small compared to the respective PVB and PVC, therefore by including indirect tax as a cost (as per the appraisal) or benefit has no impact on the forecast or reforecast BCR.

4.37 From Table 4.8, it can be seen that:

- By considering indirect tax as a benefit or cost, the reforecast BCR is 1.2, thus representing a return of £1.20 for every £1 spent, which is considered low value for money by the DfT.
- The reforecast BCR is lower than the forecast BCR of 2.5 mainly due to the observed higher than forecast scheme cost and lower than forecast observed journey time benefits.

4.38 It should be noted that the BCR ignores non-monetised impacts. Following the guidance current at the time of appraisal, the impacts on wider objectives such as environmental, accessibility and integration must be assessed, although they are not monetised. These wider objectives are covered in the following chapters.

Wider Economic Impact

4.39 It is inherently difficult to isolate and measure wider economic impacts which could be attributed to the scheme. However, it is important to understand the socio-economic context in which the scheme opened and how the A69 bypass may have assisted local and regional socio-economic aspirations.

Forecast

4.40 The AST scored the sub-objective as 'neutral' and stated the following with regard to potential wider economic impacts of the schemes:

'Haydon Bridge has not been found to be within a Regeneration Area, and therefore the impact is not applicable'

Evaluation

4.41 The A69 bypass is a local scheme implemented to address the high volume of vehicles passing through the village which was causing problems such as congestion, poor air quality, traffic noise, road safety and community severance. As such, it is unlikely that the scheme has had a wider economic impact and therefore the AST score of 'neutral' is upheld within the EST.

Key Points – Economy

Present Value Benefits

- The outturn journey time benefits from the scheme are £21.9 million, 34% lower than forecast in the scheme COBA, showing that benefits were overestimated in the appraisal.
- One of the scheme objectives was to reduce collisions in Haydon Bridge, but forecasts stated collisions would increase due to the addition of the two tie-in junctions. As such, a monetary disbenefit of £3.7 million was forecast. Since scheme opening, the annual collision rate has decreased by 0.3 but statistical tests show the saving could not be attributed to the scheme. The collision benefit was therefore not monetised and assumed to be £0m.
- Overall, the outturn PVB of £38.2 million which is 16% higher than the forecast PVB of £45.5 million.

Present Value Costs

- The outturn investment cost was £32.6 million, 31% higher than forecast.

Benefit Cost Ratio

- Taking indirect tax as a benefit to the Treasury, the scheme achieves a BCR of 1.2, which is regarded as low value for money by the DfT.

Wider Economic Impacts

- The A69 bypass is a local scheme implemented to address a number of local issues and therefore it is unlikely that the scheme has had a wider economic impact and the sub-objective is scored ‘neutral’ as predicted.

5. Environment

Scheme Objectives:

- *To ease congestion and to address safety concerns arising from conflicting pedestrian and vehicle movements.*
- *Reduce community severance.*
- *Improve the environment for residents, pedestrians, and cyclists in Haydon Bridge.*

5.1 The Environmental Statement (ES June 2005) noted that residential properties in Haydon Bridge were located along both sides of the old A69 and the population experienced severe environmental problems such as community severance, noise, and air pollution. There were also safety concerns arising from the conflict between motorists and pedestrians. The proposed bypass was intended to re-route the old A69 around the southern edges of the town to address these environmental and safety concerns.

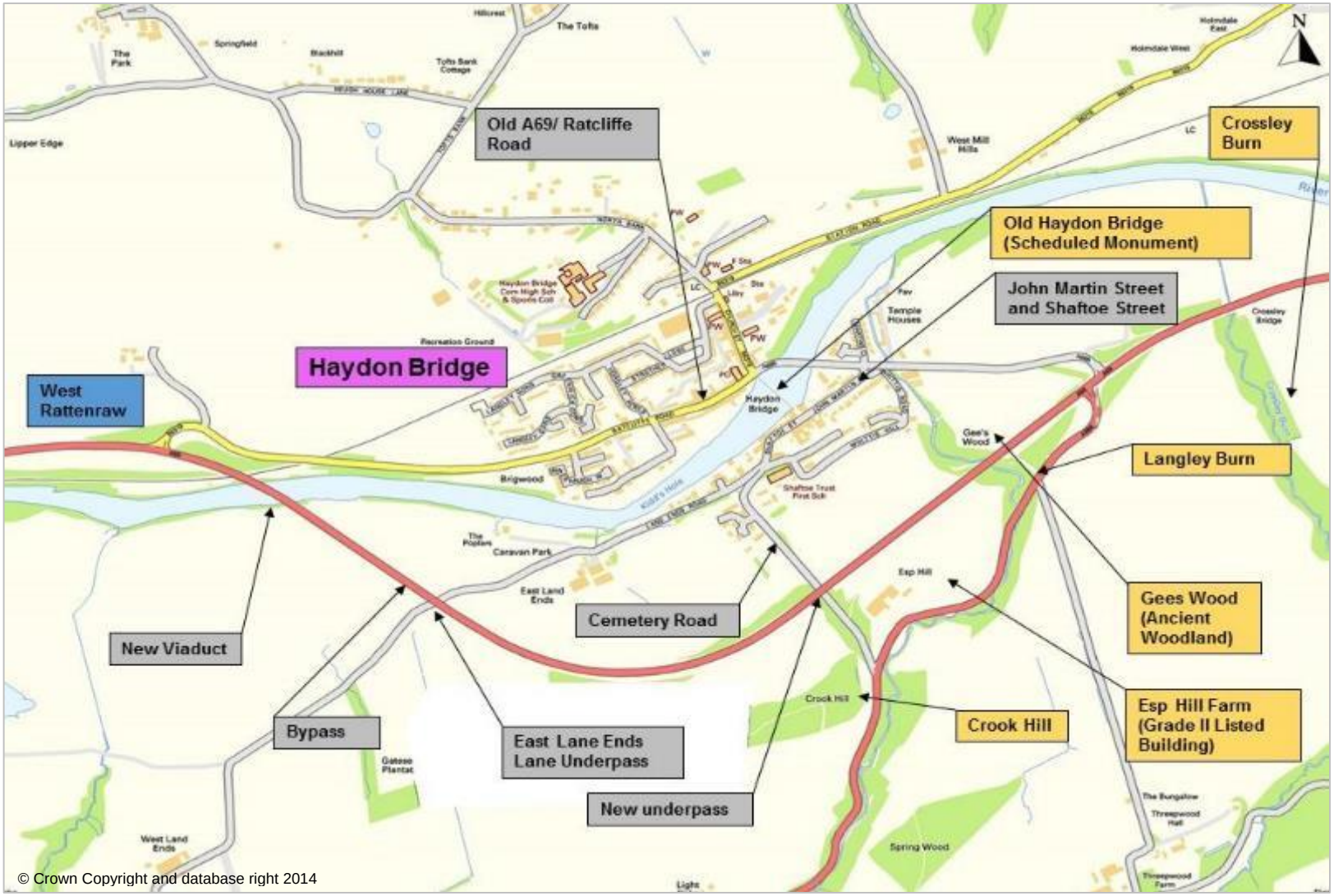
5.2 By removing a significant volume of traffic from the centre of Haydon Bridge, the scheme would bring about an improvement in traffic noise, vibration and air quality for a considerable number of residents living close to the old A69. However, there were a small number of individual farmhouses and residential properties situated on the periphery of the village which would be adversely affected by the proposals, as well as a number of other environmental constraints.

Introduction

5.3 This section documents the evaluation of the environmental sub-objectives, focussing on those aspects not fully evaluated at the OYA stage or where suggestions were made for further study.

5.4 A key location plan is provided below which serves to identify locations of sites mentioned within this chapter (Figure 5.1).

Figure 5.1 Key Location Plan for the A69 Bypass Haydon Bridge[9]



[9] Appendix F provides a map showing Haydon Bridge Conservation Area.

Summary of OYA Evaluation Findings

The OYA study identified a number of areas for further analysis at the FYA stage to confirm the longer term impacts of the scheme on the environment, which are summarised below.

Noise

It was expected that the depths and locations of specific noise mitigation in the form of cuttings, false cuttings and earthworks could be confirmed at the FYA stage when it was expected that the as built drawings would be available to POPE.

Landscape

At OYA it was considered too soon to evaluate the longer term effects of new planting for integration and screening, which with ongoing establishment of the landscape areas should be considered at FYA.

The proposed street trees at key locations along the old A69 within the village had not been planted and this together with any other streetscape improvement measures to help restore the village character would require confirmation.

It was expected that 'As Built' plans and landscape / ecology management information e.g. the Handover Environmental Management Plan (HEMP) would be made available for the FYA evaluation.

Heritage of Historical Resources

It was confirmed at OYA that the paper and digital archaeological archive had been deposited at the Northumberland County Record Office. However, the deposition of the finds archive in the Museum of Antiquities, Newcastle upon Tyne on completion of the project remained outstanding at OYA.

Biodiversity

Mitigation measures have been provided as expected. Some information for bats and other species e.g. reptiles and otter was available for the construction period but no post opening monitoring information was made available to POPE and it was not possible to fully evaluate this sub-objective at OYA. Biodiversity would be re-considered at FYA by which time further monitoring or survey information post opening may be available.

Water Quality

It was suggested that the water sub-objective be revisited for the FYA report including consultation with the Environment Agency, by which time it was anticipated that as built and monitoring information would be available.

5.5 It is the intention of this report to evaluate the effectiveness of the scheme at FYA according to the scheme's objectives, and a number of agreed sub-objectives, as identified in the ES.

5.6 The following environmental sub-objectives were appraised in the ES and in the AST according to the DfT's objectives for transport:

- Noise
- Local Air Quality
- Greenhouse Gases
- Landscape
- Biodiversity
- Cultural Heritage
- Water Environment

- Physical Fitness
- Journey Ambience

5.7 For each of the environmental sub-objectives, the environmental impacts predicted in the AST and ES are assessed against those observed at FYA. This section is based upon findings from the OYA evaluation and new evidence obtained at FYA, including:

- An evaluation of the ongoing effectiveness of the mitigation measures implemented as part of the scheme.
- An updated summary of key impacts against all of the nine WebTAG sub-objectives, with particular focus on assessment of sub-objectives where it was too early to conclude at the OYA evaluation stage.
- Additional analysis relevant to close out issues or areas for further study as identified at the OYA stage to for consideration at the FYA stage.

Methodology

5.8 This section focuses on those aspects not fully evaluated at OYA, or where at OYA, suggestions were made for further study and also any issues that have arisen since the OYA evaluation. The detail of the OYA study is not repeated here, and reference is made to the OYA report where required, although key points are incorporated into this FYA report where appropriate to provide contextual understanding.

5.9 No new modelling or survey work has been undertaken for this FYA environmental evaluation.

Data Collection

5.10 The following documents have been used in the compilation of this section of the report:

- A69 Haydon Bridge Bypass Environmental Statement June 2005 Volumes 1 (excluding the Heritage section), 2, 3 and non-technical summary (NTS);
- Appraisal Summary Table (AST) November 2006;
- Environmental Site Visit Reports (construction period);
- A Review of Bat Mitigation in Relation to Highway Severance September 2011;
- Non-Motorised User Audit Report (Context Report and Post-Construction Audit) May 2009 Final;
- Archaeological Finds Disposal Consent Form;
- Health and Safety File (H&S) July 2009 - includes As Built Plans and a Landscape and Environmental After Plan (LEAP);
- Construction Environmental Management Plan (CEMP) December 2007; and
- Draft Handover Environment Management Plan (HEMP) 2009 version 0.

5.11 A full list of the background information requested and received to help with the compilation of this chapter of the report is included in Table 9.1(Appendix C).

Site Inspection

5.12 As part of the FYA evaluation, a site visit was undertaken in July 2014, with some additional photographs taken in August and November 2014 including those to provide comparison views with selected ES photomontages, visualisations, views and OYA photographs. These are shown in Appendix D and E.

Consultation

5.13 Organisations contacted as part of the FYA evaluation regarding their views on the impacts they perceive the road has had on the environment are shown in Table 5.1.

Table 5.1 Summary of Environmental Consultation Responses

Organisation	Field of Interest	OYA Comments	FYA Comments
Natural England	Biodiversity & Landscape	Unable to comment as although provided advice on ecological matters at the time of the ES it does not have a remit to undertake follow-up visits.	Not consulted at FYA based on OYA response
English Heritage	Heritage	Generally satisfied regarding archaeology. The conservation area, setting of listed buildings etc. have benefitted from reduced traffic. Considers that the legacy of the redundant transport infrastructure needs to be addressed.	No further consultation required as full response received at OYA
Environment Agency	Water	Raised concerns including communication with Highways England, sedimentation, possible lost opportunities and ongoing monitoring	Confirmed it has not received any post construction river monitoring data. Provided information for pollution incidents since 2010 but none relevant to the bypass.
Northumberland County Council	General	Noise and air quality improved within Haydon Bridge village, Public Right of Ways (PROWs) as expected, provided observations on biodiversity, and confirmed that the archaeology report has been deposited for archive.	No AQ or noise complaints received from residents in village or close to bypass, not aware of any pollution incidents. No complaints or reports of problems relating to any of the PROW alterations made as part of the bypass scheme and footpaths continue to be well used.
Haydon Bridge Parish Council	General	Commented on most topics and disappointed that improvements within Haydon Bridge have not materialised. Overall considers that the benefits outweigh the disadvantages.	Updated comments made at OYA. Traffic related feedback relating to congestion/safety considered within the relevant traffic chapters. Bypass improvements continue to be well received locally and the village has regenerated itself since the bypass was opened
North Pennines AONB	AONB	Impact as expected from Morralee Fells.	No further consultation required
Tyne Rivers Trust	Water	No response	Impacts on the local water environment considered better than expected
Northumberland Wildlife Trust	Biodiversity	No response	No response

Organisation	Field of Interest	OYA Comments	FYA Comments
Archaeological Consultant	Archaeology	-	Provided copy of Finds Disposal Consent Form

5.14 The A69 DBFO Company has provided animal mortality data with one reported incident on the bypass since opening in 2009 (cat in July 2013).

Traffic Forecast Evaluation

5.15 Three of the environmental sub-objectives (noise, local air quality and greenhouse gases) are directly related to traffic flows. No new noise or air quality surveys are undertaken for Post-Opening Project Evaluation (POPE) and an assumption is made that the level of traffic and the level of traffic noise and local air quality are related.

5.16 The ES noted that the existing traffic on the A69 was approximately 12,500 vehicles per day (vpd), through the centre of Haydon Bridge, 13% of which were heavy goods vehicles (HGVs). ES forecast traffic for the Do-Something scenario (from ES Figure 5.0210) is provided in Table 5.2 below together with 2014 observed traffic flows. As explained in the traffic section of this report forecast flows have been interpolated to 2014 to compare with the ES predictions.

5.17 The ES expected that with the bypass would reduce overall flows by 74% and reduce HGVs passing through Haydon Bridge by 93%. As indicated in the traffic sections of this report, due to the different collection methods at the 'before', OYA and FYA periods, the classification of HGVs is not consistent and it has not therefore been possible to assess the accuracy of HGV forecasts at FYA.

5.18 The ES noted in the local air quality section that the average speed on the bypass was estimated at 82.9km/h (51 mph) compared with 34.3km/h and 38.4km/h on two links through the centre of the village (21 and 24mph).

Table 5.2 Forecast and observed traffic flows on the old A69 and bypass

Location	ES forecast 2009	ES forecast 2024	ES forecast factored to 2014	Actual 2014	Flow change	% change
Old A69 west of Church Street	2,700	3,500	3,000	2,000	-1,000	-34%
B6319 Church Street	3,500	4,600	3,800	2,500	-1,300	-34%
Old A69 east of Church Street	4,400	5,700	4,800	3,000	-1,800	-37%
A69 Bypass	12,200	16,000	13,500	12,500	-1,000	-7%

5.19 From Table 5.2 it can be seen that observed flows in 2014 indicate that, in line with the OYA findings, traffic through the village has remained significantly reduced and by more than the 74% expected in the ES. Observed traffic flows are all lower than forecast; between 1,000 and 1,800 vehicles on the old A69 and 1,000 on the bypass. It should be noted that ES forecasts were based on high growth assumptions; traffic growth generally has not increased at the expected highest growth rate which is a major factor in the significant differences in predicted and observed traffic flows.

5.20 At OYA average speeds were calculated based on the observed journey time information. At FYA an assumption has been made that journey times have remained the same as at OYA for the old

[10] ES Figure 5.02 Air Quality Banding & Network Links Do Something Layout notes that 'Forecast Traffic Flows show Optimistic Growth'

A69 post opening and therefore average speeds at FYA are assumed to be the same as calculated at OYA (i.e. approximately 29mph).

5.21 On the bypass average speed at OYA was calculated to be approximately 54mph. At FYA average 24 hour speeds are calculated to be 49mph in the eastbound direction and 51mph in the westbound direction, which are both in line with the ES prediction (51mph).

Five Years After Assessment

5.22 Included in this section is a brief summary of statements from the AST, ES and OYA evaluations (including close out/ key issues identified for further reporting at the FYA stage) which have been included to provide the context for the FYA evaluation.

Noise

AST Forecast

5.23 The AST stated that traffic would be moved away from residential areas giving a reduction in noise impacts. It was assessed that 259 people would no longer be exposed to noise levels over 70dB(A) and that the population annoyed by noise would reduce by 102.

Environment Statement

5.24 The NTS to the ES summarised that noise levels would improve for many village residents as the bypass would be relocated away from Haydon Bridge, from the provision of landscape mounding and the construction of the bypass in cutting. Approximately 54 properties would experience an increase in traffic noise and no properties would qualify for noise insulation.

5.25 The ES included specific noise mitigation measures in the form of cuttings, false cuttings and earth mounding at various locations along the bypass, and a low noise surface was proposed for the bypass.

5.26 The ES concluded that the scheme would give significant overall benefits in the reduction of traffic noise, traffic noise nuisance, and traffic induced vibration nuisance.

OYA Conclusions

5.27 Based on the OYA site visit, it was noted that noise mitigation in the form of cuttings, false cuttings and earthworks appeared to have been provided as expected. It was suggested that this should be confirmed at the FYA stage when the as built drawings would be available to POPE.

5.28 The observed traffic flow changes compared to forecast changes indicated that that the traffic reduction through Haydon Bridge village was greater than expected. On the bypass traffic flows were slightly higher than forecast in the ES (+9%) but based on the POPE methodology it could be assumed that noise levels were as expected i.e. traffic flows were no more than 25% higher than expected.

5.29 The OYA EST noted that significant reductions in through traffic as a result of the bypass would have benefitted residential properties adjacent to the scheme. Traffic was more than 20% less than forecast and noise due to traffic was considered to be better than expected on the old A69. The bypass had introduced a new source of noise into the countryside for the few properties nearer to the route and noise was assessed overall as expected on the bypass.

FYA Consultation

5.30 Northumberland County Council responded that since the bypass opened it has not received any complaints about noise matters from residents either in the village or living close to the new road and that subjectively; it is felt that there is a much improved living environment in the village since the bypass was opened.

5.31 The Parish Council commented that the bypass has resulted in improvements to the village from the removal of noise, dirt, vibration and the constant damage created by the continuous movement of heavy traffic through the heart of Haydon Bridge.

FYA Evaluation

5.32 A low noise surface has been provided as expected.

5.33 The ES did not expect that any properties would qualify for noise insulation and no information has been provided to POPE to confirm whether this has been the case, however the environmental As Built permanent mitigation plan notes 'double glazing to Esp Hill as agreed'. Esp Hill Farm is Grade II listed (the red barn in Figure 5.2 below is at Esp Hill Farm).

5.34 Based on the site visit and As Built plans it would appear that noise mitigation earthworks have been provided as expected (typical example in Figure 5.2).

Figure 5.2 Example of noise mitigation earthworks view east along bypass at Cemetery Road Bridge - false cutting on left with hedge along crest and cutting slope on right

5.35 At FYA, observed traffic flows are more than 20% lower than forecast on the old A69 and noise due to traffic is likely to be better than expected.

5.36 On the bypass traffic flows at OYA were slightly higher than expected (+9%). At FYA although traffic flows are slightly lower than predicted they are within -20% of the forecast and noise impacts are therefore considered to be as expected.

5.37 There is no comparable HGV data available at FYA and speeds on the old A69 and bypass are in line with ES predictions. Table 5.3 below summarises the traffic noise impacts of the scheme.

Table 5.3 Evaluation Summary: Noise

Sub-Objective	AST	FYA
Noise	Population annoyed: Do-Minimum = 284 Do-Something = 182 Estimated population annoyed reduces by 102.	Better than expected on the old A69 and as expected on the bypass

Local Air Quality

AST Forecast

5.38 The AST stated that at a distance of 20 metres from the proposed bypass there would be a predicted increase of +1.603µg/m3 in annual mean particulate matter (PM10) and +6.13 µg/m3 in annual mean nitrogen dioxide (NO2) but there would be no properties within 100 metres of this road. Traffic would be re-routed away from the town and the majority of people would benefit. The number of properties improving was assessed to be 559 and deteriorating would be 7.

Environmental Statement

5.39 The ES concluded that the comparison of emission levels between the 'Do-Minimum' and 'Do-Something' scenarios showed concentration levels would reduce for those properties along the line of the existing A69 and increase, marginally, for the few properties within 200 metres of the proposed route (the properties East Land Ends (just beyond 200m from the route), Cragside, Esp Hill Farm and Esp Hill Cottage were subjected to background concentrations only).

5.40 However, all predicted levels were expected to fall well within UK Air Quality Strategy objectives. As estimated concentrations with the scheme were not above the air quality criteria, detailed modelling was not required.

5.41 The overall effect of the proposal was expected to be positive as traffic would be re-routed away from the most heavily populated area, benefiting the majority of Haydon Bridge residents. The increase in total emissions of nitrogen oxides (NOx), PM10 and carbon dioxide (CO2) were considered to be negligible.

OYA Conclusions

5.42 The OYA EST noted that along the new bypass, air quality was likely to be as expected (i.e. traffic flows were no more than +10% higher than expected). Along the old A69, traffic flows had reduced to below 5,000 AADT, and observed flows were more than 10% lower than those predicted, indicating good air quality with pollutant concentrations potentially lower than expected. Overall air quality was assessed as expected on bypass and better than expected on old A69.

FYA Consultation

5.43 Northumberland County Council (NCC) responded that it discontinued air monitoring in Haydon Bridge village in 2009. The perception being that the contribution from traffic emissions through the village centre would vastly improve as a result of the bypass. Since the bypass opened, NCC has not received any complaints about air quality matters from residents either in the village or living close to the new road. Subjectively, it is felt that there is a much improved living environment in the village since the bypass was opened.

5.44 The Parish Council considers that the bypass has led to improvements in the village from the removal of emissions.

FYA Evaluation

5.45 At OYA it was noted that the comparison of forecast and observed traffic flow changes showed that the observed decrease in traffic in Haydon Bridge was greater than expected and this remains the same at FYA. Traffic flows have reduced to below 5,000 AADT, and observed flows are more than 10% lower than those predicted, indicating improved air quality.

5.46 Along the bypass, although observed flows are slightly lower than those estimated (-7%) with a change of -1,000 AADT pollutant concentrations are unlikely to be significantly changed, particularly given that the nearest properties are over 100m away. Therefore based on POPE methodology it can be assumed that local air quality is as expected i.e. traffic flows are within 10% of forecast.

5.47 There is no comparable HGV data available at FYA and speeds on the old A69 and bypass are in line with ES predictions. Table 5.4 below summarises the local air quality impacts of the scheme.

Table 5.4 Evaluation Summary: Air Quality

Sub-Objective	AST	FYA
Air Quality	Wtd Conc of PM_{10} = -388.27 (2009) Wtd Conc of NO_2 = -1435.29 (2009)	Better than expected on the old A69 and as expected on the bypass

Greenhouse Gases

5.48 The assessment of the impacts of transport schemes on emissions of greenhouse gases is one of the environment sub-objectives. WebTAG notes that carbon dioxide (CO_2) is considered the most important greenhouse gas and it is therefore used as the key indicator for assessing the impacts

of transport options on climate change. Changes in CO_2 levels are considered in terms of equivalent tonnes of carbon released as a result of the scheme. Carbon emissions are therefore estimated for the DS and DM scenarios using forecast and observed FYA data.

AST Forecast

5.49 The AST and ES predicted that carbon emissions would increase from 3,474 to 3,800 tonnes of CO_2 per year, equating to an increase of 326 tonnes of CO_2 This can be explained due to the bypass being longer and speeds being higher than on the old A69 through the village, however, the exact size of the appraisal area used to calculate this is unknown.

5.50 Since the scheme was appraised, the approach to presenting the impact on greenhouse gas emissions has changed and it is now considered by tonnes of carbon rather than CO_2. Using WebTAG guidance, the AST forecast tonnes of carbon dioxide (CO_2) has been converted to tonnes of carbon using the standard conversion factor (44/12). This gives a net increase of 89 tonnes of carbon between the DM and DS scenarios.

FYA Evaluation

5.51 A reforecast of carbon emissions for the DM and DS scenarios at FYA has been calculated on old A69 and bypass using current DMRB methodology. Outturn carbon emissions were calculated using the same methodology for the DM and DS scenarios, using observed traffic flows, speed data and HGVs collected for this study. Due to inconsistent HGV classifications between the forecasts and observed data (as noted in Section 2.13), observed HGV proportions were assumed to be as forecast. Table 5.5 shows the results from the carbon emission assessment.

Table 5.5 Carbon Emissions DM and DS at FYA

	Carbon Emissions (carbon tonnes/year)	
	Reforecast	Outturn
Do Minimum	788	710
Do Something	1,210	1,128
Net Change	422	418
	54%	59%

5.52 Table 5.5 demonstrates that outturn carbon emissions show a net increase of 418 tonnes of carbon (59%) between the DM and DS scenarios, which is line with the reforecast net increase of 422 (54%) tonnes of carbon. The net increase can be attributed to the vehicles travelling further and at higher speed on the bypass compared to the old A69.

5.53 Observed flows on the bypass are 4% higher than forecast, however, on the old A69 observed flows are between 25% and 30% lower than forecast. This under prediction is offset by higher than forecast observed speeds on the bypass and old A69, causing the outturn tonnes of carbon to be in line with the reforecast.

Table 5.6 Evaluation Summary: Greenhouse Gases (tonnes of carbon)

Sub-Objective	FYA Score	Evaluation
Greenhouse Gases	+ 418	As expected

Landscape and Townscape

AST Forecast

5.54 The AST assessment for landscape stated that there would be no significant effect upon the two adjacent statutorily designated areas (Area of Outstanding Natural Beauty (AONB) and World Heritage Site (WHS)). The most adverse effects would be on the topography (rolling valley sides

and flat floodplain) and the strong Enclosure field pattern. Benefits would be derived from an increase in the mosaic of woodland cover. The impact was assessed as moderate adverse.

5.55 The AST assessment for townscape stated that the Haydon Bridge Conservation Area (see Appendix F for map) would benefit from the reduced traffic. Traffic previously dominated the townscape and its reduction would bring buildings to the forefront, enabling human interaction to flourish. Planting of six trees along the de-trunked section of road would provide a further sense of natural integration to the village. The impact was assessed as moderate beneficial.

Environmental Statement

5.56 The ES noted that the bypass route would be to the south of Haydon Bridge and for the most part to the south of the River South Tyne. The scheme would have no effect on the designated Hadrian's Wall WHS or North Pennines AONB and Geopark. The ES identified that the main benefit of the scheme would be the improvements to the townscape of Haydon Bridge and the Conservation Area, as a result of the significant reduction of traffic through the village centre.

5.57 The bypass would disrupt the locally important enclosed field pattern and impact on the attractive local landscape which was unaffected by the existing A69. The newly engineered slopes would be visible on the gently undulating hillside and the four new bridges would be new structures in the landscape. The widened transport corridor would become more visible, would fragment Gees Wood, and affect other groups of trees leading to a loss of tranquillity.

5.58 Visually the greatest change would be from the elevated valley sides where some open views would be replaced with views of the bypass. It was expected that as the new planting matured the visual impact of the bypass would be reduced. The scheme was not expected to include any lighting of the bypass or any junctions.

5.59 Mitigation measures would aim to integrate the scheme into the local landscape by appropriate use of cuttings and embankments, extensive tree and shrub planting and new native species hedgerow planting. In total, about 4.5 hectares of additional woodland planting would be provided. Along the old A69 the ES mitigation plans indicated that six heavy standard trees would be planted at key town centre locations for traffic calming and townscape enhancements.

Changes since the ES

5.60 Lighting at the junction at the eastern end of the scheme was included during detailed design due to safety concerns[11]. POPE is not aware whether the ES Landscape and Visual Impact Assessment (LVIA) was updated to take account of this change.

OYA Conclusions

5.61 New dry stone walling had been used to good effect as a boundary treatment to tie into existing walls and preserve local landscape character. Landscape maintenance had been undertaken although noxious weed was present particularly in open grass areas of the scheme. Rabbit burrows were evident within some plots at the eastern end of the scheme.

5.62 Earthworks including the use of mounding, cuttings and false-cutting succeeded in screening a significant proportion of the route from view. As expected the new river and rail crossing on embankment towards the western end of the scheme was visible within the local landscape.

5.63 At the OYA site visit, fields at the foot of the river crossing embankments had yet to be returned to agriculture in agreement with the landowner, although it was understood that this did happen subsequently. It was suggested that the area should be revisited at FYA.

5.64 Lighting was not expected to be provided as part the scheme, however, the eastern junction had been lit and the visual impact was considered at OYA to be worse than expected at the time of the ES.

5.65 OYA EST Landscape - Mitigation measures had been implemented in line with proposals and new planting was establishing satisfactorily. Cuttings and false cuttings helped provide immediate

[11] As reported at OYA the Fire Brigade raised safety concerns over right turning traffic leaving the A69 at the eastern junction and as a consequence, lighting was installed at this junction.

screening of traffic using the bypass. Dry stone walls provided a sense of place by integrating the scheme into the local landscape. Ongoing establishment of landscaped areas should be reconsidered at FYA. The impact was assessed as expected.

5.66 OYA EST Townscape - Significant reductions in through traffic within the village had benefited the Conservation Area. Heavy standard tree planting had yet to be undertaken and this together with any other improvements to restore the village after traffic was removed should be evaluated at FYA. The impact was considered to be as expected for traffic although tree planting had not yet taken place.

FYA Consultation

5.67 The Parish Council (PC) considers that there has been no negative effect on the Hadrian's Wall WHS, however, it notes that the view of the river bridge from the Moralee Fell (North Pennines AONB) is still overpowering although mellowing slowly and that trees/planting may create more distraction to the bridge in time (Figure 5.3). As noted at OYA, the bridge concrete is still considered to be very white and could have been 'toned down' (Figure 5.10).

Figure 5.3 Long distant views east from lane at the eastern edge of the AONB at Moralee Fell. A69 and new river bridge visible in centre view.

5.68 The PC notes that a litter problem has developed in the vicinity of the river bridge as a result of motorists discarding rubbish from vehicles and that several litter picks have been undertaken by volunteers to remove rubbish. (NB: it should be noted that the LEAP included litter picking as a regular aftercare activity – 'the contractor shall undertake litter clearance 12 times per annum to the entire soft estate' and this should have included litter in areas near the bridge).

5.69 With regard to views to and from the bypass the PC note that the wide views are being restricted with trees and hedge growth which is considered a shame but inevitable – it reports that comments from users are still good. As expected the vigorous growth of trees and hedges has created a good screen and the route of the bypass is hidden from most viewing points. Thinning will be necessary in time.

5.70 The use of earthworks and cuttings is considered to have succeeded in reducing impacts and this aspect of the design has been well received locally and from bypass users. The PC also states that there has been an improvement in the appearance of the construction works compound sites since OYA – with no evidence of them at FYA. It is also noted that Gees Wood woodland has returned to its former splendour and that the use of stone walling was impressive and as the stonework settles in it will become integrated with the landscape.

5.71 With regard to improvements within Haydon Bridge village the PC confirms that the height of street lights has been reduced and some new railings provided but is disappointed that the promised help to create narrowing of the old road and installation of parking bays has not happened. The PC says that the traffic bridge over the River South Tyne in the village was to be left in good order and in their opinion this has not taken place.

5.72 At OYA the PC considered that there was too much lighting at the East End ('visible for miles') and at FYA it confirms that it would still prefer less lighting particularly as Haydon Bridge is so near to

the dark sky zone[12], and also because no lights are installed at the west end and 'no problems have been found there'.

FYA Evaluation

5.73 Comparison views at FYA with selected ES photomontages and OYA photographs are shown in Appendix E.

Landscape

5.74 As Built' landscape plans confirm the areas of planting and seeding provided. Planting has continued to establish well since OYA and growth is considered to be good and subject to ongoing successful establishment should fulfil its landscape objectives for screening and integration by the design year. There is evidence of replacement planting (plants small within shelters) and occasional dead trees although this is not considered to be an issue as the majority of plants are growing well as illustrated in comparison views in Appendix D. Traffic is still visible on the bypass from some viewpoints on higher ground where the route is not in cutting but given time it is expected that planting will effectively screen views of the bypass (Figure 5.4) although as expected the river crossing will remain visible in the floodplain as illustrated in Figure 5.10.

Figure 5.4 View to bypass in centre view from Tofts Bank

5.75 It is understood from the LEAP that the planting and grass areas have been subject to a five year aftercare period. There was evidence that maintenance in the form of weed free circles and weed control along hedge lines has been carried out in the past. Individual guards are still in place and will require removal at some point, the LEAP indicates that this operation would be at the end of the aftercare period (i.e. 2014). Stakes to feathered and select standard trees were expected to be removed at the end of maintenance year 3; at FYA some of these stakes remain in place.

5.76 The LEAP included the requirement for regular rabbit control. Rabbit infestation at the eastern end of the bypass noted as an issue at OYA did not seem to be a problem at FYA.

5.77 At FYA it was evident that a small number of trees/shrubs have not been regularly up-righted as part of routine checks and are now growing at an angle - it is too late for this to be corrected and they may need to be removed during a cycle of thinning in the future (Figure 5.5). As noted in the LEAP, it would appear that formative pruning of hedgerows has been undertaken to promote dense growth and a stable shape (Figure 5.6).

5.78 During the site visit some browning of Cherry tree leaves was noted (Figure 5.7) which could be a symptom of the fungal disease Cherry Leaf Scorch[13]. It is understood that only leaves are affected

[12] Northumberland National Park along with Kielder Water & Forest Park and Kielder Observatory Astronomical Society have officially been awarded 'Dark Sky Status' by the International Dark Skies Association to become Europe's largest Dark Sky Park.

[13] The Royal Horticultural Society (RHS) webpage notes 'Leaf scorch was known as an uncommon disease in the UK for many years, but since the early 1990's it has become more common, especially in the south east, and appears to be spreading. It principally attacks Prunus avium (wild cherry and its cultivars) with unconfirmed reports from P. padus (bird cherry).

and despite being striking and unsightly it does little damage to the trees, and varies in severity from year to year.

Figure 5.5 Example of trees which have not been maintained in an upright growing position

Figure 5.6 Realigned section of East Land Ends lane with new hedgerow boundary establishing well and tying into the retained existing hedge with trees

Figure 5.7 Cherry tree exhibiting signs of fungal disease. Trees generally in plot showing good growth (left)
Figure 5.8 Noxious weed infestation within open grassland along the bypass (centre)
Figure 5.9 Lack of recent maintenance within planting plots (right)

5.79 Visibility splays and verges had been cut at the time of the FYA site visit (Figure 5.10). In other open grassed areas and within planting plots grass had not been cut and noxious weeds were present (as was the case at OYA) giving the landscape areas a somewhat 'unkempt' appearance, which does nothing to enhance the approaches to Haydon Bridge (Figure 5.8 and Figure 5.9). The LEAP expected grass areas to be mown four times per year.

Figure 5.10 Planting plot at eastern junction illustrating typical good growth beginning to screen vehicles using the bypass. Verge recently cut (July) with open grass areas uncut

5.80 A copy of the first draft of the HEMP has been provided to POPE which notes that it was drafted at the outset of the 5-year maintenance period as an outline framework for the document. It was expected that it would be reviewed and updated annually for the 5 years before handover to the Managing Agent in 2014. At the time of writing no later versions have been made available and as such the HEMP does not provide the updated information relating to landscape and the other environmental sub-objectives which was expected for the scheme.

5.81 The draft HEMP says that it would instruct on the maintenance and monitoring required on site after handover. With regard to landscape it was expected that (in summary) the HEMP would include information on:

- Mowing of ordinary grass and wildflower grass;
- Thinning and pruning of trees and shrubs; and
- Maintenance of hedgerows and town centre trees.

5.82 With regard to the OYA issue relating to the reinstatement of the fields adjacent to East Land Ends Lane at the foot of the river crossing embankment slopes, this has been completed and returned to agriculture as illustrated in Figure 5.11. ES mitigation plans indicated new hedge planting in this location to strengthen the existing field pattern to help 'absorb' the road and embankment into the landscape and act as wildlife corridors. This planting does not appear to have been implemented, although it is shown on the as built plans.

5.83 It is also noted that in 2012 the scheme received a CEEQUAY Award[14], which celebrates *"Improving sustainability through best practices"* for Civil Engineering, Infrastructure, Landscaping and Public Space projects.

Figure 5.11 Looking towards bypass from East Land Ends Lane across area restored to agricultural use

Townscape

5.84 The local townscape has continued to benefit from the significant reduction in through traffic. Since OYA streetscape improvements have been implemented at the Church Street junction including new walling and railings with some rationalisation of signage. The PC also confirms that lighting has been reduced in height. (Figure 5.12 and Figure 5.13)

5.85 The planting of six heavy standard trees in key locations along the old A69 within the village, proposed in the ES for traffic calming and townscape enhancement, has not happened. It is understood that as part of the de-trunking works and negotiations with NCC the tree planting was omitted and any allowance was set against other de-trunking issues mainly involved with the old bridge over the river, however, as noted in its consultation response the PC is not aware that the bridge works took place and is disappointed that the help to downgrade the old carriageway did not materialise.

5.86 There is no doubt that Haydon Bridge has benefitted from the reduction in traffic, however, had the opportunity to implement environmental enhancements been taken forward the scenic quality of the town would have improved, particularly important as the village is designated a Conservation Area.

[14] www.ceequal.com/awards_126.html

Figure 5.12 Old A69 (Ratcliffe Road) through Haydon Bridge

Figure 5.13 New railings and walling at end of old bridge at junction Ratcliffe Road (old A69) with Church Street to right

5.87 Table 5.7 below summarises the impacts of the scheme on landscape and townscape.

Table 5.7 Evaluation Summary: Landscape

Sub-Objective	AST	FYA
Landscape	Moderate adverse	As expected
Townscape	Moderate beneficial	

Heritage

AST Forecast

5.88 The AST stated that little was known about the archaeological potential along the route, thus the scale of impact could not be determined without field investigation. There would be a beneficial impact on the village, but this would not ameliorate the adverse impact on the cultural heritage (built and below ground) along the route corridor. The overall impact was assessed as moderate adverse.

Environmental Statement

5.89 The electronic copy of the ES provided to POPE did not include the main heritage assessment (Section 6 in Volume 1), although there is some limited information in the ES Summaries and

Conclusions (Section 22) and the ES non-technical summary (NTS). The NTS noted that the village of Haydon Bridge grew around the river crossing point and that there has been a bridge at this location for at least 700 years. The bridge is a scheduled monument (SM)15. The NTS notes that there are also a number of listed buildings, a conservation area and to the north, Hadrian's' Wall World Heritage Site. Evidence of human activity in the area can be traced back to the Neolithic Age, the Bronze Age and the Roman occupation.

5.90 The NTS noted that archaeological survey work was being arranged and identified the following impacts;

- Positive impact on the cultural heritage of the village centre, and the setting of the scheduled ancient monument would benefit from the removal of large volumes of traffic;
- The scheme would pass close to Esp Hill Farm (Grade II listed) and to minimise effects new hedge and tree planting, in keeping with the landscape, would be provided along the line of the route near the farm;
- Historic field patterns would be affected along the route and to reduce impacts some field boundaries would be re-aligned to replicate the existing regular field pattern; and
- Some archaeological sites known. Archaeological survey work would identify and record any unknown buried remains and if found important sites would be preserved where possible and a programme of excavation and recording of sites would be undertaken.

OYA Conclusions

5.91 For built heritage it was noted at OYA that the village of Haydon Bridge had benefitted and there had been a positive impact on listed buildings, the conservation area and the setting of the old bridge(SM) over the river as expected, as a result of the removal of significant volumes of through traffic and in particular the reduction in HGVs. It was suggested that the status of any streetscape improvements should be revisited at FYA.

5.92 The bypass is in cutting close to Esp Hill Farm (Grade II listed) and hedges with trees were provided along the highway boundary, which together with tree and shrub planting on the embankment slopes at Cemetery Road helped minimise the visual impact although, as expected, the setting of the building had been affected.

5.93 As expected historic field patterns had been affected by the bypass. It was confirmed that new hedgerows have been provided along the highway boundary to link into existing hedges and provide a framework along the road.

5.94 The Archaeological Investigation Report (September 2008) stated that the results of the fieldwork were disappointing, confirming a general lack of features of archaeological interest. No features of archaeological interest were found during the watching brief. The palaeo-environmental coring produced no significant results - it indicated changes in vegetation and land use during Neolithic and from early Medieval to late Medieval periods (said to be of interest in general terms and significant in a regional context). The Strip, Map and Sample of areas revealed little of interest and recovered one copper alloy object (undated fitting fragment). Thirty artefacts were retained altogether during the excavations; all the pottery (24no.) was C18th or C19th, 3 fragments of clay pipe, a sheep bone and piece of worked flint. The report concluded that the area had probably been used in a fairly non-intensive way as farmland.

5.95 OYA EST - Archaeological fieldwork confirmed a general lack of features of archaeological interest within the route corridor. The paper and digital archive had been deposited with the local authority, although confirmation that the finds archive had been deposited with the Museum in Newcastle remained outstanding. As expected the built heritage within the village had benefitted from the removal of significant volumes of through traffic particularly HGVs. Overall the impacts were evaluated to be better than expected.

[15] Scheduled Monument and Grade II listed now only used by pedestrians.

FYA Consultation

5.96 The PC reports a problem with traffic congestion in the conservation area around Shaftoe Street and John Martin Street which they say is 'disheartening' and is caused by traffic diverting through the village, likely to avoid the A686 junction with the bypass. (This is discussed further in the relevant Traffic sections and Journey Ambience evaluation).

5.97 The PC explained that it is creating a village archive and were expecting photographs of the building of the bypass to be made available to them and which to date they have not received. In December 2014, Highways England provided aerial scheme photographs to the parish council.

FYA Evaluation

5.98 With regard to archaeology, the archaeological consultants for the scheme provided a copy of the Finds Disposal Consent Form (dated 3/11/2011) which confirmed that Highways England's preferred option was for the finds from the site to be discarded once they had been analysed and suitably recorded. This closes out the OYA issue relating to the deposition of any finds and no further evaluation of archaeology is required at FYA.

5.99 With regard to built heritage, Haydon Bridge continues to benefit from a significant reduction in through traffic along the old A69. A concern has been raised by the PC regarding congestion in the conservation area south of the river. Unfortunately there is no before or after scheme opening traffic data for Shaftoe Street or John Martin Street which would enable this concern to be investigated.

5.100 At OYA English Heritage raised a concern regarding the vibrancy/appearance/character of the village and felt that the legacy of redundant/over-engineered public realm needed to be addressed once the traffic had been removed from the main village street through the conservation area. Lighting has been reduced in height and new walling and railings have been implemented at the Church Street junction, although no other streetscape improvements have been undertaken (see Townscape section above). Figure 5.14 illustrates the setting of the old bridge across the River South Tyne with the village centre (Ratcliffe Road) to the right.

Figure 5.14 View west illustrating the setting of the old Haydon Bridge (Scheduled monument)

5.101 Since OYA an information panel has been provided on the old bridge and a blue heritage plaque commemorating Philip Larkin's association with Haydon Bridge has been unveiled at 1A Ratcliffe Road (Figure 5.15 and Figure 5.16). Both installations are the result of local Parish Council initiatives and are therefore not directly connected with the bypass scheme, however, the reduction in traffic particularly HGVs has undoubtedly improved the setting for these features within the village conservation area.

Figure 5.15 Heritage blue plaque

Figure 5.16 Heritage blue plaque

5.102 Planting to screen Esp Hill Farm has continued to establish well as can be seen in Figure 5.17 below illustrating its setting in relation to the bypass. The hedge planted along the farm access road, which the as built plan identifies as an offsite hedge, did exhibit some signs of dieback (Figure 5.18 and Figure 5.19).

Figure 5.17 View towards Esp Hill farm from Cemetery Road bridge, with the bypass in cutting near the farm

Figure 5.18 Looking west to traffic on bypass

Figure 5.19 Bypass in cutting and top of lorry just visible beyond hedge planting

5.103 Table 5.8 summarises the impacts of the scheme on Heritage. Archaeological fieldwork confirmed a general lack of features of archaeological interest within the route corridor, and is therefore the impact is better than expected in the AST. As expected the built heritage has benefitted from the removal of traffic through the village, although local council concerns over increased traffic adjacent to a conservation area cannot be verified. Overall, the impact of the scheme on heritage is likely to be better than expected, although without additional information a re-score cannot be undertaken.

Table 5.8 Evaluation Summary: Heritage

Sub-Objective	AST	FYA
Heritage	Moderate Adverse	Likely to be better than expected

Biodiversity

AST Forecast

5.104 The AST stated that the biodiversity appraisal was based on adverse impacts on farmland birds, wintering lapwing and possible but unlikely impacts on Atlantic salmon, bullhead and lamprey. Potentially significant cumulative impacts on bat flight lines would be mitigated. The overall impact was assessed as moderate adverse.

Environmental Statement

5.105 The ES noted that there were no nationally important sites on or near the proposed route of the bypass although the Tyne and Allen river gravels cSAC16 was approximately 7.5km downstream. Ecological surveys had identified protected species within the route corridor including: otters, several species of bats, Atlantic salmon, brook and sea lamprey, red squirrels, grass snakes and badgers.

5.106 The key potential impacts were noted as;

- Severance of bat flight lines, loss of feeding habitat and the risk of road injuries and mortality;
- Disturbance to otter and loss of their holts along the River South Tyne;
- Potential disruption of salmon and lamprey spawning grounds;
- Disturbance and loss of lapwing wintering habitat; and
- Loss of brown hare, red squirrel and grass snake habitat.

5.107 Ecological mitigation measures were proposed to minimise potential impacts including;

- Extensive habitat creation including woodland, hedgerow and species rich grassland;
- Fencing and underpasses to prevent wildlife suffering road injuries;
- Installation of bat boxes and restoration of bat flight lines;
- Retention and replacement of trees where possible to minimise loss of habitat; and
- Phased river works to protect fish during migration and spawning season.

Update since ES

5.108 It is understood that additional reptile surveys were undertaken in 2005 which concluded that grass snake recorded on grassland at the western end of the scheme in 2004 were not found during the more intensive 2005 survey, leading to the conclusion that this land was of local importance as a transitory site for grass snake, but that there was no resident population of this species present. The 2005 survey did however reveal the presence of a small resident population of common lizard in this grassland.

5.109 South of the railway line in an area of unmanaged grassland a small population of slow worm and common lizard were found to be present making the area of local importance for reptiles.

OYA Conclusions

5.110 No As Built Plans were made available to POPE, however the OYA site visit confirmed that mitigation measures appeared to be in place e.g. badger fencing along the highway boundary, retention of existing woodland where possible, new planting including compensation woodland adjacent to Gees Wood and post and rail fences alongside the footpath in Gees Wood for use by red squirrel to allow access to woodland either side of the new bridge without them having to go onto the ground. There was also some evidence of species diversity within the grassland areas.

5.111 Two bat monitoring reports were made available to POPE for the construction period 2007 and 2008. Monitoring had been undertaken in order to assess the change in bat usage and the success of short-term mitigation measures. The 2008 report concluded that construction was not having a significant adverse effect on bats. The OYA site visit confirmed that a new bat structure had been provided spanning the bypass.

5.112 Scheme Environmental Site Visit Reports for the construction phase noted that otter activity continued in the vicinity of the bridge construction works. These reports also confirmed that the temporary otter holts were constructed. They also noted that during construction bat crevices were built into the east abutment cladding of the viaduct and bat boxes were installed under the bridge

[16] cSAC candidate Special Area of Conservation

deck and also in mature trees near the river and Gees Wood. (Figure 5.20, Figure 5.21 and Figure 5.22 - taken at FYA).

Figure 5.20 Illustrates a bat crevice built into the east abutment cladding

Figure 5.21 Bat box fixed to a mature tree alongside the river South Tyne

Figure 5.22 Bat boxes located under the river crossing bridge deck

5.113 The OYA EST stated that mitigation measures had been provided as expected. Some information for bats and other species e.g. reptiles and otter was available for the construction period but no post opening monitoring information was available to POPE and it was not possible to fully evaluate this sub-objective. Likely that impacts would be as expected. Biodiversity should be reconsidered at FYA.

FYA Consultation

5.114 The PC states that it would like to compliment the care taken to protect all aspects of wildlife; in its opinion very little disturbance occurred at the time of construction and has quickly recovered. In some parts the PC considers that the improvements have enhanced the habitats.

5.115 The PC reports that it has spoken with local wildlife groups and volunteers who are happy to report that all species are doing well and the improved corridor created with continuous hedge planting has given new opportunities for wildlife.

FYA Evaluation

5.116 In addition to the mitigation noted at OYA, as built plans confirm the locations of badger proof fencing and the following mitigation;

- Bat boxes incorporated into the bridge structures;
- Permanent otter holts constructed under Defra licence and supervised by an ecologist;
- Locations where post and rail fencing would act as red squirrel crossings and bat flight lines under bridges. At FYA in Gees Wood on the footpath below the bridge it was noted that the top rail of the fence has been vandalised and requires repair (Figure 5.23).

Figure 5.23 Vandalised post and rail fence within Gees Wood

Bats

5.117 The Review of Bat Mitigation in Relation to Bat Severance report 2011 includes the Haydon Bridge Bypass as one of the case studies. This report makes reference to after opening scheme monitoring in 2009. As POPE does not have a copy of the 2009 monitoring information, use has been made of the 2011 report analysis which took into account monitoring at the Haydon Bridge bypass in 2008, during the road construction, and in 2009, after opening of the road. It was concluded that;

5.118 River South Tyne new bridge - similar levels of activity were maintained, however it was noted that while the functionality appeared to have been maintained, activity appeared to have been suppressed during construction (2008). It was not possible to draw any conclusions on whether activity was suppressed between baseline surveys and construction/post construction surveys;

5.119 Gees Wood - a reduced level of commuting activity along the woodland edge was indicated. Bats were noted as generally flying under the new bypass, although small numbers were noted as flying over the new bypass at a height at which vehicle collisions could occur. While the functionality of this route had been maintained, activity appeared to have reduced from the levels recorded in 2007, with the lowest levels of activity recorded in 2009;

5.120 Cemetery Road - still used by commuting bats. It was however noted that while the functionality appeared to have been maintained, the overall number of bat passes was seen to decrease after construction of the bypass. The number of bat passes reduced in 2009 compared to 2008 or 2007.

A similar pattern was seen in the number of bat passes recorded in 2009 compared to 2007. It was not possible to make any comparisons with the baseline survey in 2004;

5.121 Guidance Structure - the commuting route continued to be utilised after installation of the bat structure. Activity levels appeared to be consistent with those recorded in 2008 prior to installation of the bat structure. The activity indices increased gradually from 2005 to 2008. All activity was relatively low (e.g.1 bat in 2005 and 6 in 2006) and therefore conclusions were difficult to draw. The report noted that the monitoring data did not state whether the bats were confirmed crossing the road 'using' the wire bridge or just recorded in the vicinity.

Species Rich Grassland and habitat creation areas

5.122 The site visit confirmed some evidence of more species diverse grass swards developing in the areas identified on the As Built plans as wildflower seeded areas (Figure 5.24). Limited noxious weeds were present probably due to the low fertility soils used. POPE is not aware that any surveys have been undertaken which would confirm how the developing sward compares with the seed mix originally sown.

5.123 As discussed in the landscape section above, extensive habitat creation has been carried out as expected including areas of native woodland and hedgerow planting which is generally establishing well and exhibiting good growth. Planting links into adjacent existing vegetation providing connectivity for wildlife.

Figure 5.24 Example of species diversity establishing on embankment slopes at western end of the bypass on approach to river bridge

5.124 With regard to biodiversity the draft HEMP expected that (in summary) the handover plan would include information on:

- Maintenance of mammal fencing;
- The pollarding and pruning of vegetation to direct bats and birds under bridges where appropriate;
- The monitoring of bat flight lines/bat movements and numbers with additional mitigation provided if necessary; and
- Keep records of on-site animal fatalities.

5.125 The draft HEMP states that 'through monitoring and correct implementation of the LEAP the biodiversity management is being fulfilled. The biodiversity management will be reviewed at the end of the maintenance period (2014) by the Managing Agent'. It is not known to POPE the outcome of any such review or whether there has been any post opening survey or monitoring undertaken. Based on the information made available to POPE at FYA it is likely that impacts are generally as expected, however, more detailed information would be required to confirm the success or otherwise of the mitigation measures incorporated into the scheme and the effect on species and habitats.

5.126 Table 5.9 summarises the impacts of the scheme on biodiversity.

Table 5.9 Evaluation Summary: Biodiversity

Sub-Objective	AST	FYA
Biodiversity	Moderate adverse	Likely to be as expected

Water and Drainage

AST Forecasts

5.127 The AST stated that there would be significant adverse impact on the River South Tyne with bed and bank erosion during operation. The impact overall was assessed as moderate adverse.

Environmental Statement

5.128 The ES stated that the River South Tyne was an EC designated salmonid fishery (seeks to protect freshwater bodies as waters suitable for sustaining fish populations) and was noted as an important river for fishing. Statutory sites identified were SSSI[17] Warmley Riverside and cSAC Tyne and Allen Gravels. Statutory species identified were Atlantic Salmon, brook and sea lamprey and otter.

5.129 The Environment Agency (EA) categorised the River South Tyne water quality General Quality Assessment (GQA) as Class B and also as RQO1[18.] The ES noted that historically it was prone to flooding and an area of land at risk was on the right bank of the river, west of Haydon Bridge, at the location of the proposed river crossing. Langley Burn and Crossley Burn were noted as relatively minor tributaries of the River South Tyne and that no water quality data was available from the EA for these watercourses and the ES assessment assumed therefore that they were also RQO1.

5.130 The ES noted that the potential impacts on the watercourses would be greater during the construction phase with a potential effect on river flows and increased risk of river pollution. In channel works to construct the bridge piers would significantly reduce the cross-sectional area of the River South Tyne which would alter flow characteristics and might lead to increased flood levels or increased inundated areas during flood events. It would also lead to changes in the river bed morphology and could also affect fishing.

5.131 The removal of vegetation and topsoil, together with other construction activities could lead to greater surface water run-off to receiving watercourses, increased sediment loading and risk of pollution incidents. In order to mitigate any potential risks, measures would be undertaken to safeguard water quality, riverbanks, flooding and any impact on fishing.

5.132 The key impact during the operational phase of the project would be experienced by the flow regime due to the introduction of the piers within the River South Tyne. This might result in local erosion and deposition of river bed material; however the naturally dynamic nature of the river would mean that these processes were likely to occur without the construction of the piers. The ES included mitigation for the operational phase and this is considered in the evaluation section below.

OYA Conclusions

5.133 At OYA it was noted that although the HA (as in place at the time) had agreed to a gravel management plan and the EA had received information about the movement of gravels within the river during construction, the EA was also expecting to be provided with post construction monitoring, particularly as there had been a 'significant flow event'[19]. As the ES provided for a

[17] SSSI – Site of Special Scientific Interest

[18] RQO1 As well as GQAs for water quality, the EA also sets River Quality Objectives (RQO's) as targets for water quality, which are based on the need to rely on rivers for water supplies, recreation and fisheries. The River South Tyne within the Haydon Bridge reach has an RQO of 1, which provides the most stringent controls on water quality available to the EA.

[19] A 'significant flow event' for this scheme was agreed with EA as being a 1 in 10 year flood event.

system of monitoring to be implemented, the OYA considered that it would be expected therefore that monitoring would have been undertaken and data provided to EA.

5.134 It was suggested that the water sub-objective be revisited at FYA including consultation with EA. Hopefully as built and monitoring information would be available to enable water to be fully evaluated.

5.135 The OYA EST noted that the EA raised concerns about lack of communication, sedimentation, lost opportunities in the design process and post construction monitoring of river gravels. No information had been made available to POPE that would indicate that drainage was performing other than as expected. The impacts on water were likely to be as expected but further information would be required to confirm this and it was hoped that As Built information and monitoring data relating to erosion would be available at FYA.

FYA Consultation

5.136 The Environment Agency (EA) circulated the teams within its local north east office. The Flood Risk team commented that;

'*Highways England agreed to undertake monitoring of riverbank erosion and gravels in the South Tyne during the construction of the Bypass. It was agreed that monitoring would take place 100metres upstream of the new bridge and downstream to the existing footbridge in the village. Construction took 2 years and the EA were concerned about the temporary works and their impact on the gravels, erosion and flood risk. We received monitoring data from the construction contractors during the 2 years. The received data showed little riverbank erosion or movement of gravels.*

The EA states that under the Water Resources Act the Agency can only regulate the Highway Agency to provide the EA with the monitoring data during construction. However, through negotiation, we agreed that the HA would provide a post construction riverbank, bed and gravel survey of the agreed area (as above) if a 1 in 10 year flood event occurred. Unfortunately we have not received this data'.

5.137 As this enquiry relates to the post construction data, the EA recommends that Highways England is contacted as they are the data custodians.

5.138 EA was unable to provide any other comments at FYA due to fisheries /biodiversity staff involved at the time of the works / OYA consultation having left the EA and because it has not undertaken any monitoring of the scheme in terms of flood risk so cannot provide any idea of the impacts. The EA provided information on pollution incidents since 2010 but none of the data was of relevance to the POPE evaluation.

5.139 It is understood, with regard to the agreement with EA for post construction monitoring, that the DBFO Co were not asked to undertake any monitoring as part of the handover documentation and were not aware of any commitments given if a 1 in 10 flood event were to occur. This is unfortunate as the ES also specifically included the commitment for operational monitoring.

5.140 Northumberland County Council commented that it was not aware of any water pollution incidents.

5.141 The PC commented that there is still a drainage problem below the line of the bypass on Langley Road after heavy rainfall, and that fields southwest of the river bridge retain water after heavy rain, although they also note that these fields have always been wet.

5.142 The Tyne Rivers Trust rivers watch group (TRT) commented that in its view the impact of the scheme on the local water environment was better than expected and TRT has not received any concerns about water quality from its Haydon Bridge River Watchers. TRT does not have any evidence of negative impacts to river flora and fauna but noted that as it has not been requested to carry out any monitoring for this, does not have any data to comment.

5.143 TRT has no evidence to contradict the effectiveness of the mitigation measures on the water environment and has not received any messages of concern from River Watchers or local residents. Riverfly volunteers monitor invertebrate populations towards measuring water quality on the Langley Burn and they have not reported any pollution incidents that might relate to the bypass.

FYA Evaluation

5.144 It is understood from Highways England that at the construction phase there were significant changes to the initial agreements made with the EA due to a fundamental change in the working methods and programme brought about by the heavy rainfall encountered in 2007 and 2008. A number of meetings were held with the EA and also a number of surveys and site investigations were undertaken including an Electrofish count carried out by the EA themselves. The contractor also undertook water quality monitoring.

5.145 The draft HEMP states that daily monitoring of water quality was undertaken throughout the construction period at 1 sample point and these were recorded in the CEMP (File 1 Section 10 Appendices, Appendix 5) – although the CEMP has been provided to POPE the Appendices were not. However, the EA consultation response at FYA confirms that the received construction stage data which showed little riverbank erosion or movement of gravels.

5.146 The draft HEMP also states that 'there was no further requirement to monitor water quality during the maintenance/aftercare period, however, all outfalls to the nearby watercourses shall be inspected twice per year usually in February and October and their condition reported to the Highways England representative'[20] - POPE has no information relating to any inspections of outfalls.

5.147 Detailed drainage as built information, including drawings, is included in the H&S File. With regard to the operational phase mitigation measures proposed in the ES and based on the as built information, consultation responses and site visit it is evaluated that;

- Construction of the drainage outfall into Langley Burn would be either a cascade waterfall feature or a piped system with backdrop manhole, to reduce localised erosion of the watercourse – as noted at OYA the cascade option was taken forward and EA confirmed that this had worked well. Figure 5.25 and Figure 5.27 illustrate the OYA and FYA situation;
- Provision of catch-pits within the surface water drainage system would assist with the removal of sediments – the H&S File (Volume 5 Section 5 Drainage Maintenance Issues) confirms this is the case;
- Provision of a sandbag supply at concrete linear drainage channel outfalls, to be used to prevent accidental spillages from entering the watercourses – POPE is not aware whether sandbags are available on site, however, this requirement is included in the H&S File (Volume 5 Section 5);
- Restoration of river bank vegetation as close to the original state as possible to minimise degradation of the river banks – as noted at OYA the river bank had been stabilised using tree trunks (from trees felled on site nearby) to dissipate the energy of the river to avoid erosion, which was said to be working well and the river bank re-vegetating. At FYA it is confirmed that vegetation has continued to re-establish;
- Design of bridge piers within River South Tyne to be sympathetic to flood risk and flood impact, being lozenge shaped and aligned parallel to the direction of flow – this design was taken forward as illustrated in Figure 5.25; and
- A system of monitoring would be established to assess the erosional impact of the piers on the banks of the River South Tyne. Monitoring would be carried out continuously following construction of the piers for a period of approximately eight months until the opening of the scheme. During the subsequent five-year period, it was proposed to carry out monitoring at three monthly intervals, as well as following significant flow events, for the first two years, then at six monthly intervals for the next three years. Monitoring would then be carried out at two yearly intervals as part of the inspection of the structure. Where protection works were found to be necessary, these would be monitored at a suitable frequency to ensure their effectiveness – at OYA EA reported that it had not

[20] NB: the requirement to inspect outfalls twice per year was highlighted 'yellow' in the draft HEMP provided to POPE

received the expected post construction monitoring data. The draft HEMP also notes that monitoring of river morphology would be included. At FYA POPE has not received any post construction monitoring or survey data relating to drainage or the water environment.

Figure 5.25 Haydon viaduct – new bridge crossing of the River South Tyne

Figure 5.26 OYA illustrating cascade below steps (piped alongside steps)

Figure 5.27 At FYA with vegetation having obscured cascade

5.148 Table 5.10 summarises the scheme impacts on the water environment.

Table 5.10 Evaluation Summary: Water

Sub-Objective	AST	FYA
Water	Moderate adverse	Likely to be as expected although there is no post construction data available to confirm this.

Physical Fitness

AST Forecasts

5.149 The AST stated that there might be some reduced use of footpaths south of Haydon Bridge but more journeys would be made on foot in the village. All journeys concerned would be very short and few if any cycle journeys would be affected. The overall impact was not assessed.

Environmental Statement

5.150 The ES stated that there were two public footpaths in the study area; Footpath Number 31, which runs from Cemetery Road opposite the cemetery entrance, in a general easterly direction through Gees Wood to the A686 and Footpath Number 35, which runs south-east from the junction of the A69 and the A686.

5.151 Two permissive paths existed which would be affected by the scheme. Both were provided for the benefit of anglers. They ran along the north and south banks of the River South Tyne past the point where the viaduct would cross the river.

5.152 There were no bridleways affected by the scheme.

5.153 The ES noted the following impacts;

- Journey length - no adverse impacts in journey length once the scheme was open and beneficial impacts by a reduced requirement for people crossing the main road in Haydon Bridge to walk to either the underpass or the pelican crossing;
- Adverse changes in amenity for pedestrians and others on all paths and minor roads crossed by or near to the line of the new bypass, caused by noise, vibration, headlight glare, changes to landscape and visual impact, and other disturbance from traffic;
- Beneficial changes in amenity for all users of Ratcliffe Road (the main road through Haydon Bridge); increase in pedestrian and cycle traffic caused by improved perceived

safety and much improved amenity in Haydon Bridge; improved amenity for all users of footways into and out of Haydon Bridge to east and west along the line of the existing A69.

5.154 The following mitigation measures were proposed in order to reduce adverse impacts and strengthen beneficial impacts after construction of the bypass was complete:

- Restoration of fishermen's access along both banks of the River South Tyne once construction works completed;
- Provision of a linking footpath between the lane to West Rattenraw and the riverside footpath into Haydon Bridge. Originally there was no suitable route;
- Provision of a diversion to Footpath 31 in Gees Wood to take it under the new bridge. It was proposed that in accordance with the wishes of NCC the diversion would be of a maximum gradient of 10%, include no steps, be provided with a timber handrail where it was adjacent to steep slopes and be surfaced with compacted stone sub-base and a fine granular wearing course;
- Reinstatement of access arrangements from Cemetery Road onto Footpath 31 into the school playing fields and proposed Doorstep Green, including vehicle and disabled access and preservation of an existing stone stile.

5.155 Signage directing cyclists through Haydon Bridge from either end of the scheme, as proposed in the Stage 2 Environmental Assessment Report, was not thought to be necessary due to the very small number of cyclists who were likely to be using the A69.

OYA Conclusions

5.156 It was confirmed at OYA that a new access had been provided off Cemetery Road to Footpath 31 and the Doorstep Green (area of public open space) as expected.

5.157 The two permissive fisherman's paths either side of the River South Tyne had been reinstated with a new linking path at West Rattenraw providing access to the permissive path on the north bank of the river.

5.158 The footpath through Gees Wood had been realigned and retained although the existing steep nature of the ground meant that steps had to be included. At OYA the section under the bridge was quite bare of vegetation due to dry soil conditions and could be subject to erosion. It was hoped that some vegetation would colonise and help stabilise the bank in due course.

5.159 The EST confirmed that the significant reduction in through traffic within Haydon Bridge had improved the local amenity and was likely to have encouraged more journeys by pedestrians and cyclists. Other rural footpaths had been retained and NCC had taken the opportunity to rationalise its footpath network which was seen as beneficial. The introduction of traffic into the countryside had affected the amenity of nearby footpaths. Impacts were considered to be as expected.

FYA Consultation

5.160 NCC responded that further to their OYA comments, they have had no complaints or reports of problems relating to any of the alterations that were made as part of the bypass scheme and to the best of their knowledge the footpaths continue to be well used.

5.161 The PC confirmed that the footpath diversion (footpath 35) has improved this footpath and created a better link with the path through Gees Wood. As mentioned at OYA the steps continue to make the Gees Wood path very arduous for the less fit and it is felt that the footpath design could have been altered to reduce the number of steps.

5.162 The PC is still concerned about the permissive path alongside the river and old A69 and note that this path has been a favourite route for walkers and the infill at the west end has raised the level so only the fittest can clamber up and the PC think that steps should have been provided. New planting is also reducing access to areas walked prior to the bypass construction. Figure 5.28 illustrates the situation.

5.163 With regard to provision for cyclists the PC note that this was not given much thought but as cycling is becoming a lot more important perhaps it should have been and it notes that the footpath east from the village has been suggested as part of a cycle route from the village towards Hexham.

Figure 5.28 At FYA with vegetation having obscured cascade

FYA Evaluation

5.164 No post-opening NMU surveys were available for this FYA study and there is no evidence which would confirm whether NMU journeys have changed as a result of the scheme.

5.165 A copy of the NMU Audit: Context Report and Post Construction Audit (April 2009 Final) has been provided to POPE and it summarises the consequences of bypassing Haydon Bridge for NMUs as;

- The scheme was expected to deliver significant benefits for NMUs and Vulnerable Users and it is expected to achieve all its objectives;
- In some places, the scheme has surpassed the objectives set – the County Council took the opportunity to rationalise its PROW network to provide a safer and more integrated network of routeways (Footpath 35 re-routed and access is now from Threepwood Lane rather than directly off the A69);
- The impact of the scheme on NMUs is considered to be overwhelmingly beneficial. Adverse impacts are restricted to views and noise levels in Gees Wood, the River South Tyne and Land Ends Lane;
- There will be greater connectivity between town and countryside;
- The greatest benefits to the largest number of people are in the town, where severance will be much reduced; and
- Tactile paving has been fitted at the entrance to the cemetery on Cemetery Road, at the recommendation of Highways England. Highways England reiterated the point that visually impaired people would benefit from tactile paving in other locations throughout the town.

5.166 With regard to the PC comments relating to the steps in Gees Wood, the audit report also acknowledges that there has been a ‘deterioration in comfort due to steeper gradients for the footpath in Gees Wood’ (Footpath 31) and that ’due to the slopes and the existing mature trees it was not possible to avoid slopes and steps’.

5.167 Further to the comment made at OYA, it was noted at FYA that the area beneath the bridge in Gees Wood remains bare and a short length of the top safety rail alongside the footpath has been vandalised (Figure 5.3) and placed as a ‘bridge’ across the Langley Burn in the valley bottom accessed down the slope. It is understood from the DBFO Co that as this relates to a rights of way issue, any repairs are the responsibility of the local authority, NCC has therefore been made aware of the missing rail.

5.168 No further evaluation has been undertaken as no changes regarding physical fitness have been identified during the FYA site visit. Table 5.11 summarises the impacts of the scheme on physical fitness.

Table 5.11 Evaluation Summary: Physical Fitness

Sub-Objective	AST	FYA
Physical Fitness	Total number walking or cycling > 30mins: not measured.	Beneficial

Journey Ambience

AST Forecasts

5.169 The AST stated that the route would improve the road standard and reduce traveller stress although driver views would be restricted due to planting and cuttings. Clear signage would be provided but two lay-bys would be removed. The overall impact was assessed as large beneficial.

Environmental Statement

5.170 With regard to driver views the ES noted that the scheme would have an adverse effect compared to the existing situation where traveller views were along the old A69 through the village; the scheme would take drivers away from the village centre and the historic townscape. For much of the new route the engineering requirements of the scheme would result in the need for deep cuttings and in some places false cuttings. There would be some opportunities for views out over adjacent countryside although as new landscape planting matured open views would become more restricted. On the elevated areas of the scheme, such as the viaduct, where open expansive views across the farmland would be expected the design of a solid parapet to reduce headlight glare would reduce the nature and quality of these views.

5.171 For driver stress the ES noted that the bypass would reduce levels of driver stress on both the new bypass and the existing A69. A combination of pedestrians, parked cars, HGVs and frequent minor road accesses were said to add to the risk of collisions occurring on the existing trunk road. The new route would provide an improved road layout for trunk road traffic, better visibility for drivers and a much safer environment for pedestrians on the old road.

OYA Conclusions

5.172 The Journey Ambience sub-objective considers Traveller Care (facilities and information), Traveller Views and Traveller Stress (frustration, fear of potential collisions and route uncertainty).

- **Traveller Care** – facilities remained available within Haydon Bridge with access signed from the bypass although the parish council considered that signing was not entirely as they had expected. Two lay-bys had been removed as expected.
- **Traveller Views** – views out to open countryside for drivers on the bypass are limited as expected and will become more restricted as new planting matures.
- **Driver Stress** - On the bypass traffic was free flowing with no congestion which will have reduced driver frustration, the clear signage and fewer junctions meant there was less route uncertainty and overall driver stress will have benefitted as a result of the scheme as expected.

5.173 The EST noted that the bypass provided a free flowing route to the south of the village with clear signage and junctions limited to the eastern and western ends which would have reduced driver stress. Driver views were limited by landform as expected. Existing facilities within Haydon Bridge were accessible from either junction. Impacts were assessed to be large beneficial as expected.

FYA Consultation

5.174 As noted in the Heritage section above, the PC is concerned about what it says is ‘a good proportion’ of traffic using the Alston Road diverting through the village to access the A69 eastbound rather than crossing the westbound carriageway at the junction with the A69, where,

drivers say, they feel vulnerable. The PC notes that these drivers prefer to avoid the junction by driving through the village to access the A69 on the eastbound side.

5.175 The east end junction access onto the Alston Road (A686) is also said to be causing problems as there is no deceleration lane – so traffic wanting to turn off the A69 has to slow to an appropriate speed to make the manoeuvre causing traffic behind to try to overtake – crossing into the oncoming traffic lane. The PC state that several collisions and near misses have occurred at the junction.

5.176 The PC notes that it has already talked to the DBFO Co about their serious concerns and have put the east end junction on NCC's list as their top transport priorities issue.

FYA Evaluation

5.177 With regard to the PC comments about collisions at the eastern junction – the traffic section of this report (e.g. para 3.30) confirms that 'the number of collisions at the east junction has increased since scheme opening, with a number of collisions occurring on the A686'.

5.178 Table 5.12 summarises the evaluation of the various elements of journey ambience and the scheme's impact on this sub-objective. Overall the scheme impact is large beneficial as expected.

Table 5.12 Summary of Journey Ambience Evaluation

Sub-Objective	FYA Score	Evaluation
Views from the Road	**Substantial adverse (in the longer term)** As expected	Views vary along the bypass as expected. FYA Figure 5.29 to Figure 5.31 illustrate 'significant views' identified in the ES. No views out from bypass due to cuttings, earth bunds and mitigation planting; Intermittent views through existing woodland and new woodland planting; Open views south across farmland and to Crook Hill, long distance views from the river crossing across the floodplain and towards Haydon Bridge.
Driver Stress	**Beneficial** As expected	The significantly reduced traffic on the old A69 will have reduced driver stress and improved journey ambience for pedestrians and cyclists. On the bypass traffic continues to be free flowing with no congestion and improved journey times which will have reduced driver frustration, the clear signage and fewer junctions mean less route uncertainty. With regard to fear of collision there has been an increase in collisions at the eastern junction on the bypass since OYA and the PC has serious concerns about the configuration of this junction, including the lack of a deceleration lane for westbound traffic turning off the bypass onto the A686 and drivers at the A686 junction feeling vulnerable when they attempt to cross the bypass traffic to travel eastwards. Overall driver stress will have benefitted as a result of the scheme.
Traveller Care	None	Facilities remain available within Haydon Bridge with access signed from the bypass.
Journey Ambience Summary Score	**Beneficial** but may be less than the Large Beneficial expected	There are local concerns about the safety of the eastern junction. The traffic and safety sections of this report note that there have been increased collisions since OYA.

Figure 5.29 Open views south across farmland with Crook Hill woodland to left. (taken from bypass at Cemetery Road bridge)

Figure 5.30 Open long distance views south from bypass across farmland and the floodplain at approach to viaduct embankment

Figure 5.31 Open views looking east from bypass embankment across Haydon Bridge (middle distance within woodland) to horizon beyond.

Key Points – Environment

Noise and Local Air Quality

- The significant reduction in through traffic as a result of the bypass will have benefitted residential properties adjacent to the scheme in Haydon Bridge. The observed reduction in traffic flows is greater than forecast and impacts for noise and local air quality is considered to be better than expected based on traffic flows.
- As expected the bypass has introduced a new source of noise into the countryside for the few properties nearer to the route. Traffic is slightly lower than expected (-7%) along the bypass; noise and local air quality are likely to be as expected (observed traffic within 20% of forecast for noise and within 10% for AQ).

Greenhouse Gases

- There has been an increase in carbon emissions since the bypass opened by 422 tonnes of carbon, which is in line with the reforecast increase of 418 tonnes of carbon.

Landscape and Townscape

- Mitigation measures have been implemented in line with proposals and new planting is establishing well, tree and shrub growth is generally good and is on track to provide the expected landscape integration and screening by the design year. Noxious weed infestation and lack of grass cutting along the bypass give a somewhat unkempt appearance. Cuttings and false cuttings have helped provide immediate screening of traffic using the bypass. Dry stone walls help provide a sense of place by allowing integration of the scheme into the local landscape.
- Night time lighting is worse than expected for some properties as lighting was not envisaged at the time of the ES. It is understood to have been included at the eastern junction for safety reasons. POPE is not aware whether the ES Landscape and Visual Impact Assessment was updated to take account of this change The Parish Council would prefer less lighting particularly as Haydon Bridge is close to the recently designated Northumberland Dark Sky Park.
- Significant reductions in through traffic particularly HGVs within the village have benefited the ambience along the old A69 (Ratcliffe Road). There have been some streetscape improvements (lighting/railings/rationalisation signage) but the proposed street trees have not been planted within the village and the Parish Council is disappointed that some of the expected improvements were not taken forward.
- Overall landscape and townscape evaluated to be **as expected** at FYA, receiving scores of **'moderate adverse'** and **'moderate beneficial'**, respectively.

Biodiversity

- Mitigation measures have been provided as expected. Habitats are establishing satisfactorily to provided wildlife corridors and connectivity. There is some evidence of species diversity within wildflower grassland areas although survey data would be required confirm species present within the sward.
- With regard to bats it would appear that functionality of routes had been maintained although activity may have reduced.
- The draft HEMP states that 'through monitoring and correct implementation of the LEAP the biodiversity management is being fulfilled. The biodiversity management will be reviewed at the end of the maintenance period (2014) by the Managing Agent.' It is not known to POPE the outcome of any HEMP review or whether there has been any post opening survey or monitoring undertaken. Based on the information made available to POPE at FYA it is likely that impacts are generally as expected, however, more detailed information would be required to confirm the success or otherwise of the mitigation measures incorporated into the scheme for species and habitats.
- Biodiversity impacts are **as expected**, **'moderate adverse'.**

Key Points – Environment

Heritage

- Archaeological fieldwork confirmed a general lack of features of archaeological interest within the route corridor. The paper and digital archive has been deposited with the local authority and it is confirmed that the Highways England's preferred option was for the finds from the site to be discarded once they had been analysed and suitably recorded.
- As expected built heritage within the village has benefitted from the removal of significant volumes of through traffic particularly HGVs, however, a concern has been raised by the Parish Council regarding traffic congestion within the part of the conservation area south of the river. Unfortunately POPE does not have any traffic data for this area and it is not possible to comment further.
- At OYA English Heritage felt that the legacy of redundant/over-engineered public realm needed to be addressed once the traffic had been removed from the main village street through the conservation area. Lighting has been reduced in height and new walling and railings have been implemented at the Church Street junction, although no other streetscape improvements have been undertaken.
- Since OYA an information panel has been provided on the old bridge (scheduled monument) and a blue heritage plaque commemorating Philip Larkin's association with Haydon Bridge has been unveiled at 1A Ratcliffe Road. Both installations are the result of local Parish Council initiatives and are therefore not directly connected with the bypass scheme, however, the reduction in traffic particularly HGVs has undoubtedly improved the setting for these features within the village conservation area.
- Overall heritage is likely to be better than expected as the AST appraisal took a precautionary approach and in the event little of archaeological interest was found.

Water

- A concern was raised at OYA by the EA regarding river gravel monitoring and EA confirms at FYA that it has received no post construction monitoring data despite an agreement with Highways England that it would be provided. It is understood by POPE that the DBFO Co were not asked to undertake any monitoring as part of the handover documentation and were not aware of any commitments given if a 1 in 10 flood event were to occur. Operational monitoring was an ES commitment.
- Mitigation measures have been provided and based on the as built drainage information, consultation responses and site visit it is likely that impacts on the water environment are generally as expected, however, it is not possible for POPE to confirm this due to lack of information.
- Impacts on the water environment are **as expected (moderate adverse).**

Physical Fitness

- No post-opening NMU surveys were available for this FYA study and there is no evidence which would confirm whether NMU journeys have changed as a result of the scheme, however, the reduction in through traffic within Haydon Bridge has improved local amenity and is likely to have encouraged more journeys by pedestrians and cyclists.
- Other rural NMU routes have been retained as expected although the bypass has introduced a source of noise nearby. The NMU audit report notes that as a result of the need for steps on the realigned footpath in Gees Wood there has been deterioration in comfort due to steeper gradients. The Parish Council thinks that steps should have been provided for the permissive path at the west end due to the change in level necessitated by the scheme.

Key Points – Environment

Journey Ambience

- The Parish Council has raised concerns about the lack of deceleration lane and driver vulnerability at the eastern bypass junction with the A686 Alston Road. Based on the Traffic and Safety chapters in this report it is noted that since OYA collisions at the eastern junction have increased. This may have led to fear of accidents being greater than expected.
- The bypass has provided a free flowing route to the south of the village with clear signage and junctions limited to the eastern and western ends of the bypass which, together with more predictable journey times will have reduced driver stress. Driver views are limited by landform as expected. Existing facilities within Haydon Bridge are accessible from either junction.
- Journey ambience impacts are '**beneficial'**, **but not the large beneficial expected**.

6. Accessibility and Integration

6.1 This chapter evaluates the impact of the scheme in terms of the accessibility and integration objectives; comparing qualitative forecast assessments from the scheme AST with post-opening findings and analysis of policy objectives.

Accessibility

6.2 The accessibility objective is concerned with how the scheme has affected the ability of people in different locations to reach different types of facility, using any mode of transport. The accessibility objective consists of three sub-objectives. These are:

- Option values
- Access to the transport system
- Severance

Option Values

Forecast

6.3 Option values, as defined in WebTAG, relate to the availability of different transport modes within the study area, even if they are not used. For example, a car user may value a bus service along their route even if they never used it because they have the option of another mode should their car become unavailable.

6.4 For the sub-objective regarding option values, the AST states:

'*public transport is unlikely to change due to the scheme'*

6.5 As such the AST forecast a score of neutral for this sub-objective.

Evaluation

6.6 There has been no improvement to public transport since the bypass opened hence the EST is scored as 'neutral', as expected.

Severance

Forecast

6.7 Severance was a key issue for Haydon Bridge and was identified as part of one of four scheme objectives. The AST also stated:

'Haydon Bridge village will benefit due to reduce through traffic on the main street; there would be relief of existing severance, and no new severance would be caused. Few cyclists or equestrians would be affected. Non-motorised users in town will benefit, but no provision is made for them on the new road'

6.8 The number of people expected to be impacted by the reduced severance is 1,500.

6.9 The sub-objective is scored as 'large beneficial'.

Evaluation

6.10 The Non-Motorised User (NMU) Report (May 2009) details that there were problems crossing the old A69 in Haydon Bridge before the bypass opened. Two footpaths (Footpath No. 31 and 35) and two permissive paths alongside the river bank (primarily for fishermen) were predicted to be affected by the bypass, which included the proposed diversion of footpath No. 35. See Section 5.139 to 5.158

6.11 The Report evaluated the impact on NMUs following the bypass opening and overall considered the scheme to have had a beneficial impact on NMUs. Table 6.1 details the evaluated impact on pedestrians, cyclists and equestrians following scheme opening.

Table 6.1 Impact on users

Specific User	Effect taken from Non-Motorised User Report (May 2009)
Pedestrians	Pedestrians will be much better able to use and enjoy travelling around the town, and into the surrounding countryside. All aspects (accessibility, safety, comfort and convenience) improve significantly.
Cyclists	Cyclists will be able to travel around the town more safely and conveniently; Ratcliffe Road will be a much safer environment for these users. However, the bypass scheme is unlikely to increase the number of long distance east-west or west-east cycle journeys being made.
Equestrians	Equestrians can now cross under the A69 at Cemetery Road. This will enable riders to make journeys from countryside to the north to the south of the town, and vice versa.

6.12 In addition, traffic through Haydon Bridge has reduced by approximately 80% (12,000 vehicles) and this will have made crossing the former A69 safer, reducing the need to use the underpass. Figure 6.1 shows that most users would be able to cross the road safely at almost any location, hence the scheme has reduced severance within the village.

Figure 6.1 Old A69 through Haydon Bridge

6.13 The AST predicted that 1,500 people would be affected by the reduced severance. The population of the village is approximately 2,000 (as reported in Chapter 1) and as severance has reduced since the bypass opened, the sub-objective is scored as ‘large beneficial’, in line with the AST.

Access to the Transport System

Forecast

6.14 For access to the transport system sub-objective, the AST forecast a neutral impact and states:

'Public transport is unlikely to change due to the scheme'

Evaluation

6.15 As a result of no change in access to the transport system since scheme opening, in line with the AST, the sub-objective receives a 'neutral' score.

Integration

6.16 The integration objective consists of two main elements:

- Interchange with other transport modes: how the scheme assists different modes of transport in working together and the ease of people moving between them to choose sustainable transport choices.
- Land Use Policy and Other Government Policies: how the scheme integrates with local land use and wider government objectives.

Transport Interchange

Forecast

6.17 The transport interchange objective relates to the extent to which the scheme contributes towards the Government objective of improving transport interchange for passengers and freight. Regarding this, the AST forecast states:

'The scheme does not promote transport interchange'

6.18 As such the AST forecast a neutral impact for the transport interchange objective.

Evaluation

6.19 There are no additional public transport services on the old A69 or bypass and existing public transport waiting facilities have not been improved. Overall, the scheme has not had a major impact on the provision of transport interchange and as a result, the AST assessment score of 'neutral' can be upheld.

Land Use Policy and Other Government Policies

Forecast

6.20 The AST scored the impact of the scheme on land use policy as neutral reasoning that:

'Key objectives that are facilitated by the scheme are in relation to highway design and associated signage, planting, landscaping and protected historic and important buildings. All objectives hindered by the scheme are in relation to the impact on the natural environment',

6.21 The AST also scored other Government policies as beneficial and states:

'*Key objectives affected by the scheme relate to transport and local community issues. Both would be facilitated by the proposal'*

Evaluation

6.22 An evaluation of the scheme in relation to policy at the time of appraisal and opening has been undertaken and is summarised in Table 6.2. The evaluation shows that, as forecast, the scheme has had a beneficial impact on other government policies and land use policies. Given the findings presented, it is considered that the forecast assessment of the scheme on land use policy and other government policies is 'beneficial', as expected.

Table 6.2 Scheme Alignment with National, Regional and Local Policy

	Policy/Document	Relevant Policy Objective/Reference	Relevant Scheme Impacts	Alignment
Local and Sub-Regional Policies	**Northumberland Local Transport Plan 2 (2006 – 2011)**	The LTP 2 welcomed the DfT's recommendation for the building of the A69 Haydon Bridge bypass as the scheme would contribute to Northumberland's overarching transport objectives as follows: • Accessibility: *'Widen social inclusion by improving access to work, learning, health and shops'* • Air Quality: *'Reduce the impact of traffic on air quality'.* • Safer Roads: *'Improve safety and minimise the risk of accidents on the highway network'.* • Congestion: *'Optimise the safety and efficiency of traffic movement and reduce the adverse effects of congestion'.* • Quality of Life: *'Contribute to a safe, healthy, attractive and accessible environment'.*	The scheme has contributed to the LTP 2 transport objectives in the following ways: • Accessibility: *The scheme has reduced severance as traffic flows through Haydon Bridge have reduced by approximately 80% which makes crossing the old A69 safer and improves access to local facilities such as shops and schools.* • Air Quality: *Air quality within Haydon Bridge has improved since the scheme opened*. • Safer Roads: *There are fewer collisions within Haydon Bridge but there has been an increase at the eastern junction. Overall, annual collisions have decreased by 0.3 but statistical tests show that this reduction is likely to have occurred without the implementation of the scheme.* • Congestion: *Journey times for through traffic have reduced by between 22 and 45 seconds, however, congestion was not an issue before scheme opening.* • Quality of Life: *The benefits described in the objectives above will contribute to overall improved quality of life for residents within Haydon Bridge.*	✓
Regional Policy	**North East of England Regional Spatial Strategy to 2021 (2008)**	The aim of this policy is to summarise the key long term strategy for the north-eastern region. Haydon Bridge was predicted to *improve/maintain efficiency of movement along the for key transport corridors – A69/Tyne Valley Line (Policy 49 Regional Transport Corridors).*	Journey times have improved by between 22 and 45 seconds since the bypass opened, thus suggesting the scheme has improved the efficiency of the A69.	✓
National Policy	**A New Deal for Trunk Roads in England (1998)**	The Government's overarching objectives for transport at the time of the appraisals were set out in this document, and include policies to: • Protect and enhance the built and natural environment. • Improve safety for all travellers. • Contribute to an efficient economy, and to support sustainable economic growth in appropriate locations. • Promote accessibility to everyday facilities for all, especially those without a car. • Promote the integration of all forms of transport and land use planning, leading to a better, more efficient transport system.	The scheme has contributed to the objectives in the following ways: • *Overall the scheme has improved and protected the built and natural environment.* • *There are fewer collisions within Haydon Bridge but there has been an increase at the eastern junction. Overall, annual collisions have decreased by 0.3 but statistical tests show that this reduction is likely to have occurred without the implementation of the scheme.* • *Journey times for through traffic have reduced by 22 to 45 seconds, thus improving the efficiency of the route.* • *Traffic flows in Haydon Bridge have reduced by approximately 80%, making crossing the old A69 safer for residents, reducing the need to use the underpass.* • *Public transport and transport interchange have not improved since the scheme opened.*	✓

Key Points – Accessibility and Integration

Accessibility and Integration Impacts

- The scheme has had no impact on access to the transport system or public transport, with the EST being scored as neutral for both sub-objectives.
- Severance has reduced as a result of the scheme as the reduced traffic flows through Haydon Bridge mean it is safer to cross the road, reducing the need of the underpass.
- A review of Government policy shows the scheme to have had a beneficial impact on achieving the following local and central government policies:
  - Improving accessibility;
  - Improving air quality and noise in Haydon Bridge;
  - Protecting and enhancing the built and natural environment
- All accessibility and integration sub-objectives receive an as expected score.

7. Appraisal Summary Table & Evaluation Summary Table

Appraisal Summary Table

7.1 The AST is a brief summary of the main economic, safety, environmental and social impacts of a highway scheme. Table 7.1 presents the AST for the A69 Bypass Haydon Bridge scheme.

7.2 The AST presents a brief description of the scheme, a statement detailing the problems that the scheme planned to address, and makes an assessment of the scheme's predicted qualitative and quantitative impacts against the following objectives:

- **Environment** – an estimate of the impact of the scheme on factors such as noise, local air quality, landscape, biodiversity, and water;
- **Safety** – measured reduction in the number and severity of collisions and qualitative assessment of impacts on security;
- **Economy** – estimated impact of the scheme upon journey times, vehicle operating costs, scheme costs, journey time reliability and wider economic impact;
- **Accessibility** – a review of scheme impact upon access to the public transport network, community severance, and non-motorised user impact; and
- **Integration** – a description of how a scheme is integrated with wider local planning, regional and national policy objectives.

Evaluation Summary Table

7.3 The EST was devised for the POPE process to record a summary of the outturn impacts against the same objectives, compared to the predictions in the AST.

7.4 Table 7.2 presents the EST for the scheme. An assessment of each of the objectives at the FYA stage is given. Where possible, the format of the EST mirrors the appearance and process of the AST to enable direct comparison between the two.

Table 7.1 - Appraisal Summary Table (AST)

OBJ	SUB-OBJECTIVE	QUALITATIVE IMPACTS	QUANTITATIVE IMPACT	ASSESSMENT
Environment	**Noise**	Traffic moved away from residential areas giving a reduction in noise impacts. 259 people would no longer be exposed to noise levels over 70dB(A).	**Population Annoyed:** **Do-Minimum = 284** **Do Something = 182**	Estimated population annoyed reduces by 102
	Local Air Quality	At a distance of 20 from the proposed bypass there would be a predicted increase of +1.603 µg/m³ in annual mean PM10 and +6.13 µg/m³ in annual mean NO2 but there would be no properties within 100m of this road. Traffic would be re-routed away from the town and the majority of people would benefit.	No of properties improving = 559 No of properties deteriorating = 7 (adjusted manually to avoid double counting properties)	Wtd Conc of PM10 = -388.27 (2009) Wtd Conc of NO2 = -1435.29 (2009)
	Greenhouse Gases	Greenhouse Gases would increase from 3,474 tonnes per year to 3,800 tonnes per year in opening year. The CO2 levels would increase because the proposed road is longer than the road it replaces.	N/A	+326 tonnes of CO2 in 2009
	Landscape	No significant effect upon the two adjacent statutorily designated areas (AONB and World Heritage Site). The most adverse effects would be upon the topography (rolling valley sides or flat floodplain) and the strong enclosure field pattern. Benefits would be derived from an increase in the mosaic of woodland cover.	N/A	Moderate Adverse
	Townscape	The Conservation Area will benefit. Traffic currently dominates the townscape; its removal will bring buildings to the forefront, enabling human interaction to flourish. Planting of 6 trees along the de-trunked section of road will also bring benefits.	N/A	Moderate Beneficial
	Heritage	Little is known about the archaeological potential along the route, thus scale of impact cannot be determined without field investigation. There will be a beneficial impact on the village, but this will not ameliorate the adverse impact on the cultural heritage (built and below ground) along the route corridor.	N/A	Moderate Adverse
	Biodiversity	This appraisal is based on adverse impact on farmland birds, wintering lapwing and possible, but unlikely, impacts on Atlantic salmon, bullhead and lamprey. Potentially significant cumulative impacts on bat flightlines are mitigated.	N/A	Moderate Adverse
	Water Environment	Slight adverse impact on River South Tyne bed and bank erosion during operation.	N/A	Moderate Adverse
	Physical Fitness	There may be some reduced use of footpaths south of Haydon Bridge but more journeys will be made on foot in the village. All journeys concerned will be very short. Few if any cycle journeys will be affected/	0	Total Number walking or cycling > 30 minutes: not measured
	Journey Ambience	The route will improve the road standard and reduce traveller stress although driver view will be restricted due to planting and cuttings. Clear signage would be provided but two laybys would be removed.	N/A	Large Beneficial
Safety	**Accidents**	The bypass will result in a small decrease in link based accidents, however, this is outweighed by an increase in junction based accidents, at the proposed tie-in junctions at each end of the bypass, coupled with a low observed junction accident rate at present.	**Accidents saved:** -15.36 **Casualties saved:** Fatal: 2.99 Serious: 16.54 Slight: 48.1	PVB = -£3.688m
	Security	Drivers will transfer from an urban route, where they may be vulnerable to crime during congestion etc., to a rural route, where they may be vulnerable to crime during breakdowns, due to lack of road lighting.	Estimated number of users affected = 12,698 (2004 AADT)	Neutral
Economy	**Public Accounts**	This sub-objective comprises details of investment costs, operating costs and impact on indirect tax revenue, and has been considered using the COBA11 (Rev 6) program.	Central Government PVC = £19.235m Local Government PVC = £0m	PVC = £19.235m
	TEE Business	Business Users and Transport Providers will benefit most from Travel Time savings, followed by Maintenance Delay savings. Vehicle Operating Costs also give a slight benefit.	User PVB = £26.968m Transport Providers PVB = £0.045m Other PVB = £0m	PVB = £27.013m
	TEE Consumers	Consumers will benefit most from Travel Time savings, followed by Maintenance Delay savings. Vehicle Operating costs give a slight-disbenefit.	Users PVB = £22.254m	Users PVB = £22.254m
	Reliability	The scheme is likely to increase reliability of completing a journey in a certain time, as travel on the single carriageway bypass is likely to be more reliable than travel on the existing route through the middle of Haydon Bridge, which is affected by local and pedestrian traffic.	N/A	Large Beneficial
	Wider Economic Impacts	Haydon Bridge has not been found to be within a Regeneration Area, and therefore the impact is not applicable.	N/A	Neutral
Accessibility	**Option Values**	Public transport is unlikely to change due to the scheme.	N/A	Neutral
	Severance	Haydon Bridge village will benefit due to reduced through traffic on the main street; there would be relief of existing severance, and no new severance would be caused. Few cyclist or equestrians would be affected. Non-motorised users in town will benefit, but no provision made for them on the new road.	Total number of people affected = Approx. 1,500	Large Beneficial
	Access to the Transport System	Public transport is unlikely to change due to the scheme.	N/A	Neutral
Integration	**Transport Interchange**	The scheme does not promote Transport Interchange.	N/A	Neutral
	Land Use Policy	Key objectives that are facilitated by the scheme are in relation to highway design and associated signage, planting, landscaping and protected historic and important buildings. All objectives hindered by the scheme are in relation to the impact on the natural environment.	N/A	Neutral
	Other Gov Policy	Key objectives affected by the scheme relate to transport and local community issues. Both would be facilitated by the proposal.	N/A	Beneficial

Table 7.2 - Evaluation Summary Table (EST)

OBJ	SUB-OBJECTIVE	QUALITATIVE IMPACTS	QUANTITATIVE IMPACT	ASSESSMENT
Environment		Observed traffic flows are more than 20% lower than forecast on the old A69 and adjacent properties will have continued to benefit from reduced through traffic. On the bypass although traffic flows are slightly lower than predicted they are within -20% of the forecast and noise is therefore considered to be as expected.	-	Better than expected on the old A69 and as expected on the bypass
	Local Air Quality	Observed traffic flow changes show the decrease in traffic in Haydon Bridge to be greater than expected. Traffic flows have reduced to below 5,000 AADT, and observed flows are more than 10% lower than those predicted, indicating improved air quality. Along the bypass, although observed flows are slightly lower than estimated (-7%) with a change of -1,000 AADT, pollutant concentrations are unlikely to be significantly changed. Traffic flows are within 10% of forecast and it can be assumed that local air quality is as expected.	-	Better than expected on the old A69 and as expected on the bypass
	Greenhouse Gases	Carbon emissions have increased since the bypass opened due to vehicles travelling at higher speeds for a greater distance than on the old A69.	Reforecast = +422 tonnes of Carbon (1,547 tonnes of CO_2) Observed = +418 tonnes of Carbon (1,532 tonnes of CO_2)	As expected
	Landscape	New planting is establishing well with good growth, together with the bypass earthworks (cuttings and false cuttings) the scheme is on track to provide the expected landscape integration and visual screening by the design year. Lack of grass cutting and weed control detracts from the visual amenity of the bypass. Night time lighting is worse than expected for some properties.	-	As expected (moderate adverse)
	Townscape	Haydon Bridge has benefitted from the significant reductions in through traffic and some streetscape improvements have been undertaken. However, not all proposed environmental enhancements were taken forward which would have helped improve the scenic quality of the village.	-	As expected (moderate beneficial)
	Heritage	Archaeological fieldwork confirmed a general lack of features of archaeological interest within the route corridor. As expected the built heritage within the village has benefitted from the removal of significant volumes of through traffic, although there is local concern relating to congestion within part of the conservation area. Overall heritage is likely to be better than expected as the AST appraisal took a precautionary approach and in the event little of archaeological interest was found.	-	Likely to be better than expected
	Biodiversity	EA confirms at FYA that it has received no post construction monitoring data despite an agreement with Highways England that it would be provided – no information has been made available to POPE at FYA regarding any monitoring which has been undertaken on behalf of Highways England post construction and it is not possible for POPE to comment further on whether there have been any changes to river morphology as a result of the scheme. Based on the information made available to POPE at FYA it is likely that impacts are generally as expected, however, more detailed information would be required to confirm the success or otherwise of the mitigation measures incorporated into the scheme for species and habitats.	-	Likely to be as expected (moderate adverse)
	Water Environment	Mitigation measures have been provided and based on the as built drainage information, consultation responses and site visit it is likely that impacts on the water environment are generally as expected, however, it is not possible for POPE to confirm this due to lack of information.	-	Likely to be as expected (moderate adverse)
	Physical Fitness	The reduction in through traffic within Haydon Bridge has improved local amenity and is likely to have encouraged more journeys by pedestrians and cyclists. Other rural NMU routes have been retained as expected although the bypass has introduced a source of noise nearby. The NMU audit report notes that as a result of the need for steps on the realigned footpath in Gees Wood there has been deterioration in comfort due to steeper gradients. Local concerns raised that steps should have been provided for the permissive path at the west end of the village due to the change in level necessitated by the scheme.	-	Beneficial
	Journey Ambience	The significantly reduced traffic on the old A69 will have reduced driver stress and improved journey ambience for pedestrians and cyclists. On the bypass traffic continues to be free flowing with no congestion and improved journey times which will have reduced driver frustration, the clear signage and fewer junctions mean less route uncertainty. Views vary along the bypass as expected. Facilities remain available within Haydon Bridge with access signed from the bypass. However, there are local concerns about the safety of the eastern junction and traffic data confirms that there have been increased collisions since OYA.	-	Beneficial but may be less than the large beneficial expected
Safety	**Collisions**	The annual collision saving since scheme opening is 0.3 since the scheme opened. Statistical tests have shown that this saving would have occurred without the scheme and therefore there has been no collision benefit since scheme opening.	-	PVB = £0m
	Security	There has been no impact on personal security since the scheme opened. The details of the AST are upheld at OYA the resident survey undertaken found that residents believed the scheme has improved safety for vehicles, pedestrians and cyclists due to a reduction in traffic and traffic speeds in Haydon Bridge.	-	As expected (Neutral)
Economy	**Public Accounts**	Scheme costs are higher than expected.	Forecast PVC (without indirect taxation) = £18.4m Observed PVC (without indirect taxation) = £31.3m	Worse than expected
	Transport Economic Efficiency	Journey times for through traffic have reduced by between`22 and 45 seconds since the scheme opened.	Reforecast Journey Time Benefits = £21.9m (Forecast - £32.9m)	Worse than expected
	Reliability	Adjusted route stress has remained the same following scheme opening. Before scheme opening, journey time variability on the old A69 was low and following scheme opening, journey times on the bypass are also consistent.	-	Worse than expected (neutral)
	Wider Economic Impacts	The A69 bypass is a local scheme implemented to address the high volume of vehicles passing through the village which was causing problems such as congestion, poor air quality, traffic noise, road safety and community severance. As such, it is unlikely that the scheme has had a wider economic impact and therefore the AST score of 'neutral' is upheld within the EST.	-	As expected (neutral)
Accessibility	**Option Values**	The scheme has not led to any change in public transport services.	-	As expected (neutral)
	Severance	No roads have been severed by the bypass as connectivity was maintained through the construction of two bridges. Traffic through Haydon Bridge has reduced by approximately 80% (12,000 vehicles) and this will have made crossing the former A69 safer. The Non-Motorised User Report (2009) found the impact of the scheme on NMU's to be beneficial.	Total number of people affected = Approx. 2,000	As expected (large beneficial)
	Access to the transport system	There has been no change in access to the transport system as a result of the scheme.	-	As expected (neutral)
IInteg	**Transport Interchange**	There has been no change in the transport interchange as a result of the scheme.	-	As expected (neutral)
	Land Use & Other Government Policies	The scheme has had a beneficial impact on land use policy and other government policies.	-	As expected (beneficial)

8. Conclusions

8.1 To conclude this report, this section summarises how the scheme is meeting its specified objectives.

Scheme Specific Objectives

8.2 Table 8.1 presents an evaluation of the scheme's objectives using the evidence presented in this study.

Table 8.1 - Success against Scheme Objectives

Objective	Has the scheme objective been achieved?	
Improve safety for all road users in Haydon Bridge by removing through traffic and by providing a better standard of trunk road.	• Average annual collision numbers have reduced within Haydon Bridge, however, a cluster location has been identified at the eastern junction of the bypass. Overall, collisions have reduced by 0.3, although statistical tests show that this is unlikely to be due to the scheme. • Traffic flow through Haydon Bridge has reduced by approximately 80% (12,000 vehicles). This means that it is now safer to cross the old A69 and reduces the need to use the subway.	✓
Reduce congestion and delays along the A69.	• The journey time results for before scheme opening (old A69) suggest that journey times were consistent throughout the day and there were no serious issues with congestion. • Due to the above, the scheme objective is not considered to be applicable.	**Not Applicable**
Ease the existing problems of community severance, noise and air pollution by improving the environment for residents, pedestrians and cyclists in Haydon Bridge.	• Due to reduced traffic volumes on the old A69, it is now safer to cross the road thus reducing community severance. • Local air quality and noise in Haydon Bridge has improved since the bypass opened due to the 80% reduction in traffic.	✓
Provide an environmentally acceptable solution that minimises the impact on the built and natural environment.	• All environmental impacts have been as expected as or better than expected. Local air quality and noise have improved within Haydon Bridge and overall it is considered that the scheme has improved and protected the built and natural environment.	✓

9. Appendices

Appendix A: Glossary

Terms	Definition
AADT	**Annual Average Daily Traffic**. Average of 24 hour flows, seven days a week, for all days within a year.
Accessibility	Accessibility can be defined as 'ease of reaching'. The accessibility objective is concerned with increasing the ability with which people in different locations, and with differing availability of transport, can reach different types of facility.
ADT	**Average Daily Traffic**. Average daily flows across a given period.
AONB	**Area of Outstanding Natural Beauty**
AST	**Appraisal Summary Table**. This records the impacts of the scheme according to the Government's five key objects for transport, as defined in DfT guidance contained on its Transport Analysis Guidance web pages, WebTAG.
ATC	**Automatic Traffic Count**
AAWT	**Annual Average Weekday Traffic**. As AADT but for five days (Monday to Friday) only.
AWT	**Average Weekday Traffic**. As ADT but for five days (Monday to Friday) only.
BCR	**Benefit Cost Ratio**. This is the ratio of benefits to costs when both are expressed in terms of present value i.e. PVB divided by PVC.
cSAC	**Candidate Special Area of Conservation**
CEMP	**Construction Environment Management Plan**
COBA	**Cost Benefit Analysis**. A computer program which compares the costs of providing road schemes with the benefits derived by road users (in terms of time, vehicle operating costs and collisions), and expresses the results in terms of a monetary valuation. The COBA model uses the fixed trip matrix unless it is being used in Collision-only mode.
CWS	**Country Wildlife Site**
DfT	**Department for Transport**
Discount Rate	The percentage rate applied to cash flows to enable comparisons to be made between payments made at different times. The rate quantifies the extent to which a sum of money is worth more to the Government today than the same amount in a year's time.
Discounting	Discounting is a technique used to compare costs and benefits that occur in different time periods and is the process of adjusting future cash flows to their present values to reflect the time value of money, e.g. £1 worth of benefits now is worth more than £1 in the future. A standard base year needs to be used which is 2002 for the appraisal used in this report.
DM	**Do Minimum**. In scheme modelling, this is the scenario which comprises the existing road network plus improvement schemes that have already been committed.
DS	**Do Something**. In scheme modelling, this is the scenario detailing the planned scheme plus improvement schemes that have already been committed.
EA	**Environment Agency**
EAR	**Economic Assessment Report**
ES	**Environmental Statement**
EST	**Evaluation Summary Table**. In POPE studies, this is a summary of the evaluations of the TAG objectives using a similar format to the forecasts in the AST.
FYA	**Five Years After**
HEMP	**Handover Environmental Management Plan**
HGV	**Heavy Goods Vehicle**
KSI	**Killed or Seriously Injured**. KSI is the proportion of casualties who are killed or seriously injured and is used as a measure of collision severity.

Terms	Definition
LEAP	**Landscape and Ecology Aftercare Plan**
LMP	**Landscape Management Plan**
LVIA	**Landscape and Visual Impact Assessment**
MAC	**Managing Area Contractor** Organisation normally contracted in 5-year terms for undertaking the management of the road network within a Highways England area.
MVKM	**Million Vehicle Kilometres**
NCC	**Northumberland County Council**
NMU	**Non-Motorised User**. A generic term covering pedestrians, cyclists and equestrians.
NRTF	**National Road Traffic Forecasts**. This document defines the latest forecasts produced by the Department of the Environment, Transport and the Regions of the growth in the volume of motor traffic. At the time this scheme was appraised, the most recent one was NRTF97, i.e. dating from 1997.
NTM	**National Transport Model**
NTS	**Non-Technical Summary**
OYA	**One Year After**
PC	**Parish Council**
PIC	**Personal Injury Collisions**
POPE	**Post Opening Project Evaluation**. The before and after monitoring of all major highway schemes in England.
Present Value	**Present Value**. The value today of an amount of money in the future. In cost benefit analysis, values in differing years are converted to a standard base year by the process of discounting giving a present value.
PROW	**Public Right of Way**
PVB	**Present Value Benefits**. Value of a stream of benefits accruing over the appraisal period of a scheme expressed in the value of a present value.
PVC	**Present Value Costs**. As for PVB but for a stream of costs associated with a project
QUADRO	**Queues and Delays at Roadworks**. A software program for calculating the monetary impacts of delays at roadworks.
SSSI	**Site of Special Scientific Interest**
TEE	**Transport Economic Efficiency**
TEMPRO	**Trip End Model Program**. This program provides access to the DfT's national Trip End Model projections of growth in travel demand, and the underlying car ownership and planning data projections.
TRADS	**Traffic Flow Data System**. Database holding information on traffic flows at sites on the strategic network.
UK	**United Kingdom**
VDM	**Variable Demand Modelling**
WebTAG	DfT's website for guidance on the conduct of transport studies at http://www.webtag.org.uk/
WHS	**World Heritage Site**

Appendix B: Tables and Figures Listed in this report

Appendix C: Environment Information Requested

Table 9.1 Record of environmental background information requested and received

Environment Specific Requirements	OYA Response	FYA Response
Environment Statement (ES) or if not a scheme requirement the latest Scheme Assessment Report (SAR).	A69 Haydon Bridge Bypass Environmental Statement June 2005 (Volumes 1, 2, 3 and NTS. Excluding Volume 1 Heritage section which was missing)	As for OYA
Any amendments, updates or addendums to the ES/SAR or any relevant further studies or reports. Any significant changes to the scheme since the ES/SAR.	Supplementary Reptiles Survey Summer 2005 Report on Implications of potential changes to landowner's field boundaries March 2006 Summary Proof of Evidence Environment March 2006	As for OYA
As Built drawings for landscape/biodiversity/environmental mitigation measures/drainage/ fencing/ earthworks etc.	-	Included as part of H&S File
Health & Safety File (info relevant to environment sub-objectives and may also include As Built drawings)	-	H&S File Final Issue
Construction Environment Management Plan (CEMP)	-	A69 Haydon Bridge Bypass Construction Environmental Management Plan Dec 2007 (information in appendices not included)
Landscape and Ecology Aftercare Plan (LEAP).	-	The Landscape and Environmental After Plan (LEAP) Volume 2 H&S File

Environment Specific Requirements	OYA Response	FYA Response
Handover Environmental Management Plan (HEMP).	-	HEMP Draft version 0 prepared at start of the 5 year maintenance period in 2009
Relevant Contact Names for: consultation	Provided and sourced by POPE team	As at OYA
Archaeological Reports (including any non-technical publications as well as the technical report).	A69 Haydon Bridge Bypass Archaeological Investigation September 2008	FAWD01: Summary Report Of Archaeological Evaluation Works on A69 Haydon Bridge Bypass February 2007 Copy of Finds Disposal Consent Form (3/11/2011)
Reports/results for any pre and post construction survey and monitoring work e.g. for noise, biodiversity, water quality etc).	No post-opening information provided. Construction phase Bat Monitoring of the A69 Haydon Bridge Bypass 2007 and 2008 (two reports) Site Environmental Inspection reports provided (covers the construction period)	A Review of Bat Mitigation in Relation to Highway Severance September 2011 Background information relating to preparation of a gravel monitoring plan and undertaking of electric fish surveys
Animal mortality data (pre and post opening)	Provided by the A69 DBFO Co	Update provided by the A69 DBFO Co
Post opening Non-motorised User (NMU) Audit or Vulnerable User Survey	A69 Haydon Bridge Bypass Non-Motorised User Audit (Context Report and Post Construction Audit) December 2008 Draft	A69 Carlisle To Newcastle Trunk Road Haydon Bridge Bypass Non-Motorised User Audit (Context Report and Post Construction Audit) April 2009 Final
Any information regarding environmental enhancements to streetscape/townscape e.g. for bypassed settlements.	Parish Council advised what it was expecting as part of the de-trunking of the old A69	As for OYA
Employers Requirements Works Information – environment section	-	As for OYA
HA Scheme Newsletters **Awards**	HA Newsletters Building the Haydon Bridge Bypass – The Story of Construction booklet	As at OYA

Appendix D: A69 Haydon Bridge Bypass OYA (Summer 2010) and FYA (Summer 2014) comparison photographs

Figure 9.1 OYA Cemetery Road view south (taken where bypass on bridge crosses this lane). Scheme planting was expected in time establish a new woodland edge. New stone walling is evident at top of lane on left

Figure 9.2 FYA new planting and hedges have established extremely well

Figure 9.3 OYA Illustrating rabbit burrows at eastern end of scheme

Figure 9.4 FYA view to same plot, rabbit infestation was not evident and the planting is establishing satisfactorily

Figure 9.5 OYA view looking along bypass towards river crossing viaduct with un-restored field

Figure 9.6 FYA view with fields restored and returned to agriculture

Figure 9.7 OYA Eastern junction (from A688 Alston Road) illustrating planting plot and new lighting

Figure 9.8 At FYA woodland planting is establishing satisfactorily. At the time of the FYA site visit grassland areas had not been cut and there was some evidence of dock, thistle and ragwort

Figure 9.9 OYA Example of low nutrient soil and species rich grassland beginning to establish

Figure 9.10 Similar location at FYA

Figure 9.11 OYA Gees Wood looking south towards bypass bridge

Figure 9.12 FYA from similar point on the footpath demonstrating good regrowth of adjacent vegetation

Figure 9.13 OYA Looking north to bypass on bridge through Gees Wood from the realigned footpath set within existing trees The post and rail fence alongside the footpath also provides red squirrel with passage under the bridge - reconnecting their habitat.

Figure 9.14 The FYA view - Scrub planting was intended to act as a long term flight path for bats encouraging them to fly under the bridge and away from vehicles on A69. ES plans indicate that scrub should be managed to draw bats under not over the bridge

Figure 9.15 OYA View of the bat guidance structure in place over the bypass. Haydon Bridge is visible centre view

Figure 9.16 FYA view illustrates planting establishment. Woodland blocks in the vicinity of the bat guidance structure were intended to rebuild field patterns, strengthen landscape character and help screen views of the road from Haydon Bridge. It was also expected that woodland planting would create new wildlife habitats

Figure 9.17 OYA Footpath through Gees Wood

Figure 9.18 At FYA (on right) path is still used but is softened by vegetation and has a more natural appearance

Figure 9.19 OYA Bare ground with potential to erode beneath bridge in Gees Wood

Figure 9.20 At FYA, there remains limited grass / scrub growth due to the dry and shady conditions beneath the bridge. Vandalised top rail can be seen used as a plank to cross Langley Burn.

Figure 9.21 OYA Bridge Crossing Cemetery Road

Figure 9.22 FYA view – hedge and woodland planting has established well. Hedgerows were expected to act as bat flight lines under the bridge.

Appendix E: Comparison of photographs ES (June 2005) view at OYA (Summer 2010) and FYA (Summer 2014)

The ES also included some visualisations depicting the expected future scene at a time when planting would have matured and these have also been included in this Appendix.

Figure 9.23 Looking West along the 'old' A69 within Haydon Bridge

ES

OYA

FYA

Figure 9.24 Existing view from Tofts Bank with no view of the existing A69. The photograph showed the south valley side where the proposed route would be situated within the ellipse. At OYA the bypass earthworks can be seen to the left of the large tree where the bypass is in deep cutting. To the right of the tree the road on embankment crossing East Land Ends Lane is visible. At FYA traffic on the embankment crossing East Land Ends Lane is visible. The cutting earthworks are less obvious In the landscape due to greening up of the slopes.

ES	OYA	FYA

Figure 9.25 Existing view from the Tofts looking south across the valley (ES). The existing A69 could just be seen east of Gees Wood (block of woodland within the ellipse). The proposed route would be located within the ellipse. At OYA the route of the bypass is visible mid distance with lighting at the eastern junction to left of arable fields.

ES **OYA** **FYA**

Figure 9.26 Showing existing view east down the valley. The proposed route would lie on the south valley slope within the ellipse. At OYA the bypass is visible in the centre of the view as it crosses East Land Ends Lane to enter deep cutting eastwards. At FYA from the same location illustrates the route alignment.

ES **OYA** **FYA**

Figure 9.27 Showing existing view from West Rattenraw in a south easterly direction. The proposed bypass would be located within the ellipse and to the right. ES Visualisation of the anticipated view looking towards the proposed viaduct from the West Rattenraw development. At OYA view from nearby location the old A69 is visible beyond cows with new bridge taking bypass over the River and railway line centre right and similar view at FYA.

ES **OYA** **FYA**

Figure 9.28 Existing view from garden of High Meadows across the valley. ES Visualisation looking towards the proposed route from the north hill area. OYA view from public road nearby. At FYA, the bypass is visible to right on embankment. Through centre of view the route of the bypass in cutting and associated earthworks are visible.

ES **OYA** **FYA**

Figure 9.29 Showing existing view west of the High School looking south across the valley. The proposed route would be located within the ellipse. At OYA the route of the bypass is visible in the middle distance mainly in cutting with the road on embankment to cross East Land Ends Lane to the right of the view. Similar view at FYA with new planting visible on embankment slopes along line of the bypass.

ES **OYA** **FYA**

Figure 9.30 Showing existing view looking south across the existing A69 to Gees Wood. The ellipse shows the area where the proposed route would re-join the A69. At OYA the eastern junction with lighting is visible. FYA shows A69 bypass eastern lit junction with planting on embankment in middle distance beyond tree.

ES **OYA** **FYA**

Figure 9.31 Showing existing view south from Haydon past the existing A69 towards Gees Wood. The route would re-join the existing A69 after Gees Wood in the area within the ellipse. At OYA the eastern junction and lighting is visible in the centre of the view with the old A69 from the village of Haydon Bridge linking from the right. In addition, view at FYA.

ES **OYA** **FYA**

Figure 9.32 Showing existing views south up the valley side towards the area of the proposed route shown in the ellipse. At OYA, new housing on the Showfield site on the far side of the valley block views to the bypass. In addition, the view at FYA.

ES **OYA** **FYA**

Figure 9.33 Showing existing view north within Gees Wood from the right of Way. The bridge would be located within the ellipse. At OYA - view taken from footpath looking north. As expected Gees Wood has been bisected by the bypass, woodland has been retained where possible, also the same view at FYA.

ES **OYA** **FYA**

Figure 9.34 Showing existing view from Esp Hill. The gradient of the land restricts views down into the valley base from ground floors. This view was taken from private land within the farm and was not directly replicated at OYA or FYA. ES Visualisation of the anticipated view looking north from Esp Hill Farm. OYA image is taken from near Esp Hill Farm and is similar to the visualisation with tops of lorries visible as they emerge from deep cutting. In time hedge planting along the highway boundary will help screen this traffic. FYA illustrates the view west from Esp Hill Farm access lane at FYA and shows ongoing establishment of hedge planting which screens all but the top of lorries in cutting on the bypass.

ES

OYA

FYA

Figure 9.35 Showing existing views from Castle Farm. The viaduct and embankments would be located within the ellipse and would become a significant feature in the view, even though distant. At OYA as expected the viaduct is visible. FYA illustrates the similar view.

ES	OYA	FYA
		

Figure 9.36 Showing the existing view from West Land Ends towards the floodplain. The proposed viaduct would be located within the ellipse. OYA is taken adjacent to the private garden location of the 'before' view the viaduct is clearly visible as expected. The viaduct remains visible in the landscape at FYA.

ES **OYA** **FYA**

Figure 9.37 View across River South Tyne floodplain eastwards from Lees Farm. The A69 is visible through heavily filtered oblique. The proposed viaduct would be located within the ellipse. ES Visualisation of the anticipated view looking across the floodplain towards the viaduct from Lees Farm. At OYA the image was not taken from Lees Farm but gave an impression of the visibility of the viaduct within the landscape when viewed from a distance. FYA illustrates the FYA view from the access lane to Lees Farm and Figure 20e gives the FYA distant view from the OYA location.

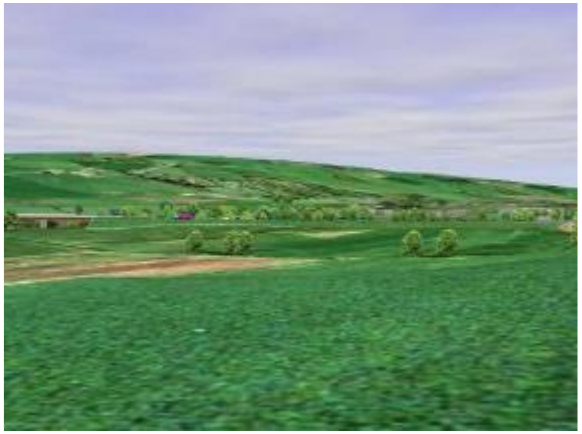
ES

OYA

FYA

Figure 9.38 Showing existing view west from East Land Ends Farm. The viaduct and embankments would be located within the ellipse. ES Visualisation looking across the floodplain towards the proposed viaduct from East Land Ends Road. At OYA - the viaduct at the river crossing and embankment to the right is visible within the floodplain as expected. The same view at FYA.

ES



OYA

FYA

Figure 9.39 ES Showing existing view north across the valley, the proposed viaduct would be located within the ellipse. At OYA, the eastern junction and lighting were visible. At FYA, although planting is establishing well it will be many years before lighting is screened.

ES **OYA** **FYA**

Figure 9.40 ES Visualisation showing that the new bridge at East Land Ends Lane would change the character locally. View at OYA. View at FYA - despite good plant growth the structure will remain a prominent feature in the local landscape.

ES **OYA** **FYA**

Figure 9.41 ES Visualisation showing that the new bridge at East Land Ends Lane would change the character locally. View at OYA. View at FYA - despite good plant growth the structure will remain a prominent feature in the local landscape.

ES **OYA** **FYA**

Appendix F: Haydon Bridge Conservation Area

Source: Northumberland County Council (2012) [Accessed 19th December 2014]