

A1 North of Newcastle Feasibility Study

Stage 3 Report



February 2015

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Executive Summary

In February 2014 the Highways Agency commissioned Jacobs to undertake this feasibility study considering A1 north of Newcastle between its junction with the A19 at Seaton Burn and the Scottish border.

The study has been split into three key stages:

- *Stage 1: Data Collection, Analysis and Problem Identification*
- *Stage 2: Option Identification, Sifting and Assessment*
- *Stage 3: Option Affordability, Deliverability and Value for Money*

This Stage 3 Report outlines the methodology and findings of Stage 3 of the study.

Stage 2 of the study recommended that four options be taken forward for a more detailed assessment as part of Stage 3.

Option	Description	Comments
Option A (referred to as Options 1 / 2 in Stage 2 Report)	8 miles of dualling between Morpeth and Felton (Online or Offline)	Improves most heavily trafficked single carriageway section of the route.
Option B (referred to as Option 3 in Stage 2 report)	Dualling remaining sections of single carriageway on the full route of the A1 between Seaton Burn and the Scottish border (37 miles of additional dualling)	Addresses fully all problems and issues on the route. Provides a benchmark for any potential improvement
Option C (referred to as Option 4 in Stage 2 report)	Dualling remaining sections of single carriageway between Seaton Burn and Ellingham (13 miles of additional dualling)	Improves most heavily trafficked single carriageway section of the route and significantly addresses problem of inconsistent carriageway standard
Option D (referred to as Option 7 in Stage 2 report)	Dualling remaining sections of single carriageway between Seaton Burn and Ellingham (13 miles of additional dualling). Upgrading 19 miles of single carriageway between Ellingham and Scremerston by means of Overtaking / Climbing lanes.	Improves most heavily trafficked single carriageway section of the route and addresses problems on lightly trafficked sections to the North

Stage 3 of the Feasibility Study has focussed in more detail on these four better performing options, aligned with the Treasury Five Case Model.

The Strategic Case for each scheme is based on the problems and issues identified in Stage 1 of the Feasibility Study. This showed that there was a clear rationale for improvements to the A1 and that all four options would go some way to addressing the issues on the route, with the scale of impact increasing as the scale of

intervention increases. Each option was also found to have a strategic fit within the local and national policy context.

As part of the Economic Case, the assessment of Environmental and Social Impacts remained unchanged from the (Stage 2) Option Assessment Report as these elements of the assessment were considered appropriate to this stage of scheme development.

The Economic Impacts within the Economic Case were subject to a more detailed assessment as part of Stage 3. The table below provides a summary of the economic assessment undertaken for each of the four options.

Benefit / Cost	Option A (Dualling Morpeth to Felton)	Option B (Dualling Full Route)	Option C (Dualling to Ellingham)	Option D (Dualling to Ellingham with complementary measures to the north)
Journey Times and Vehicle Operating Costs	£150m	£395m	£190m	£225m
Accidents	£45m	£55m	£45m	£50m
Journey Time Reliability	£15m	£75m	£20m	£45m
Wider Impacts	£30m	£75m	£35m	£35m
Present Value of Benefits (PVB)	£240m	£600m	£290m	£355m
Present Value of Costs (PVC)	£115m - £180m	£500m - £840m	£175m - £300m	£205m - £330m
Benefit to Cost Ratio	1.3 – 2.1	0.7 – 1.2	1.0 – 1.7	1.1 – 1.7
All costs and benefits presented to the nearest £5m in 2010 prices, discounted to 2010.				

All of the options are considered deliverable from an engineering perspective and there are robust procurement and management structures through which the scheme could be delivered.

If any of the options is selected to be taken forward it is recommended that they could enter the Highway Agency’s Project Control Framework at Stage 1, Options Identification.

Contents

1	Introduction	1
1.1	Introduction	1
1.2	Purpose of Document	3
1.3	Document Structure	3
2	Methodology	4
3	Outcomes of Previous Work	5
4	Stage 3 Outcomes – Strategic Case	7
4.1	Introduction	7
4.2	Case for Change	7
4.3	Strategic Fit	9
4.4	Investment Aims	10
5	Stage 3 Outcomes – Economic Case	11
5.1	Introduction	11
5.2	Options	11
5.3	Monetised Impacts	12
5.4	Non Monetised Impacts	14
6	Stage 3 Outcomes – Financial Case	16
7	Stage 3 Outcomes – Commercial Case	17
8	Stage 3 Outcomes – Management Case	18
8.1	Introduction	18
8.2	Project Governance	18
8.3	Project Plan	18
8.4	Risk Management	19
8.5	Communications and Stakeholder Management	19
8.6	Benefits Realisation	19
9	Further work	20
9.1	Introduction	20
9.2	Traffic Modelling	20
9.3	Environmental Impacts	20
9.4	Other Impacts	21
10	Stakeholder Engagement	22
11	Fulfilment of Scope	23
11.1	Summary of Scope	23
11.2	Fulfilment of Scope	23
12	Conclusions	25

Table 1-A	A1 North of Newcastle Route Sections	3
Table 3-A	Shortlisted Options	5
Table 5-A	Economic Case Assessment	11
Table 5-B	Initial Economic Benefits	12
Table 5-C	Adjusted BCR	14
Table 5-D	Environmental Impacts	15
Table 5-E	Social Impacts	15
Table 6-A	Cost Estimates	16
Table 11-A	Fulfilment of Scope	24
Figure 1-A	Study Area	2
Figure 2-A	Methodology Key Stages	4

1.1 Introduction

Following the 2013 Spending Review, the Government announced its plans for the biggest ever upgrade of the strategic national roads network. The HM Treasury document, Investing in Britain's Future (July 2013) set out details of the programmes of infrastructure investment, which included the tripling of annual investment on Highways Agency major roads enhancements from today's levels to over £3bn by 2020/21.

As part of that investment programme, the Government announced that it would identify and fund solutions, initially through feasibility studies to look at problems and identify potential solutions to tackle some of the most notorious and long-standing road hot spots in the country.

These studies are being progressed alongside the Highways Agency's Route Based Strategy programme which is considering the current and future performance of the entire network, to inform future investment decisions.

The A1 north of Newcastle was one of the identified road hotspots. The A1 north of Newcastle through Northumberland forms an important route between England and Scotland, especially for long distance traffic on the eastern side of the country. The route also caters for local commuters and agricultural traffic. This section of the A1 provides a link between England and Edinburgh, and as such has been recognised by the DfT as a route of strategic national importance.

Other key routes in Northumberland include the A1068 coastal route and the A697 towards Coldstream in Scotland. Other than these routes, roads in Northumberland are characterised as narrow rural links that connect a number of small settlements. The A1 therefore also acts as a key distributor for more localised trips, as it often provides the most direct route.

The study area under consideration as part of the A1 North of Newcastle Feasibility Study is illustrated in Figure 1-A. The route extends from the A1 junction with A19 at Seaton Burn through Northumberland passing Morpeth, Alnwick and Berwick-upon-Tweed to the Border with Scotland.

To aid the data collection/analysis and the presentation of problems and issues the route has been split up into 11 sections based on road type and geography. These route sections are shown in Figure 1-A and listed in Table 1-A.



Figure 1-A Study Area

Section	Description	Length (miles)		Speed Limit
		Dual Carriageway	Single Carriageway	
1	Dual Carriageway South of Morpeth	5.3		70
2	Dual Carriageway at Morpeth	4.6		70
3	Single Carriageway between Morpeth and Felton		8	60
4	Dual Carriageway at Alnwick	9.9		70
5	Single Carriageway North of Alnwick		5	60
6	Dual Carriageway North of Alnwick	1.4		70
7	Single Carriageway between Ellingham and Fenwick		11.4	60
8	Single Carriageway South of Berwick		7.5	60
9	Berwick Bypass South of the River Tweed		2.1	60
10	Berwick Bypass North of the River Tweed		2.2	60
11	Dual Carriageway North of Berwick	2.1		70
	Total	23.3	36.2	

Table 1-A A1 North of Newcastle Route Sections

1.2 Purpose of Document

In July 2013 the Highways Agency (HA) commissioned Jacobs to examine issues on the A1 north of Newcastle, beginning with the refresh of the business cases for the two previously considered dualling schemes between Morpeth and Felton and Adderstone and Belford.

In February 2014 the HA commissioned Jacobs to undertake this Feasibility Study considering the full route of the A1 North of Newcastle between its junction with the A19 at Seaton Burn and the Scottish border.

The study has been split into three key stages:

- *Stage 1: Data Collection, Analysis and Problem Identification*
- *Stage 2: Option Identification, Sifting and Assessment*
- *Stage 3: Option Affordability, Deliverability and Value for Money*

Further details of the methodology adopted are included within Chapter 2. This document summarises the outcome of Stage 3 of the Study.

1.3 Document Structure

The remainder of this document is structured as follows:

- *Chapter 2: Methodology*
- *Chapter 3: Outcomes of Previous Work*
- *Chapter 4: Stage 3 Outcomes – Strategic Case*
- *Chapter 5: Stage 3 Outcomes – Economic Case*
- *Chapter 6: Stage 3 Outcomes – Financial Case*
- *Chapter 7: Stage 3 Outcomes – Commercial Case*
- *Chapter 8: Stage 3 Outcomes – Management Case*
- *Chapter 9: Further Work*
- *Chapter 10: Stakeholder Engagement*
- *Chapter 11: Fulfilment of Scope*
- *Chapter 12: Conclusions*

2 Methodology

The methodology adopted as part of the development of the A1 North of Newcastle Feasibility Study is based upon the key principles set out within the Department for Transport's best practice Transport Analysis Guidance (TAG). The methodology key stages are illustrated in Figure 2-A.

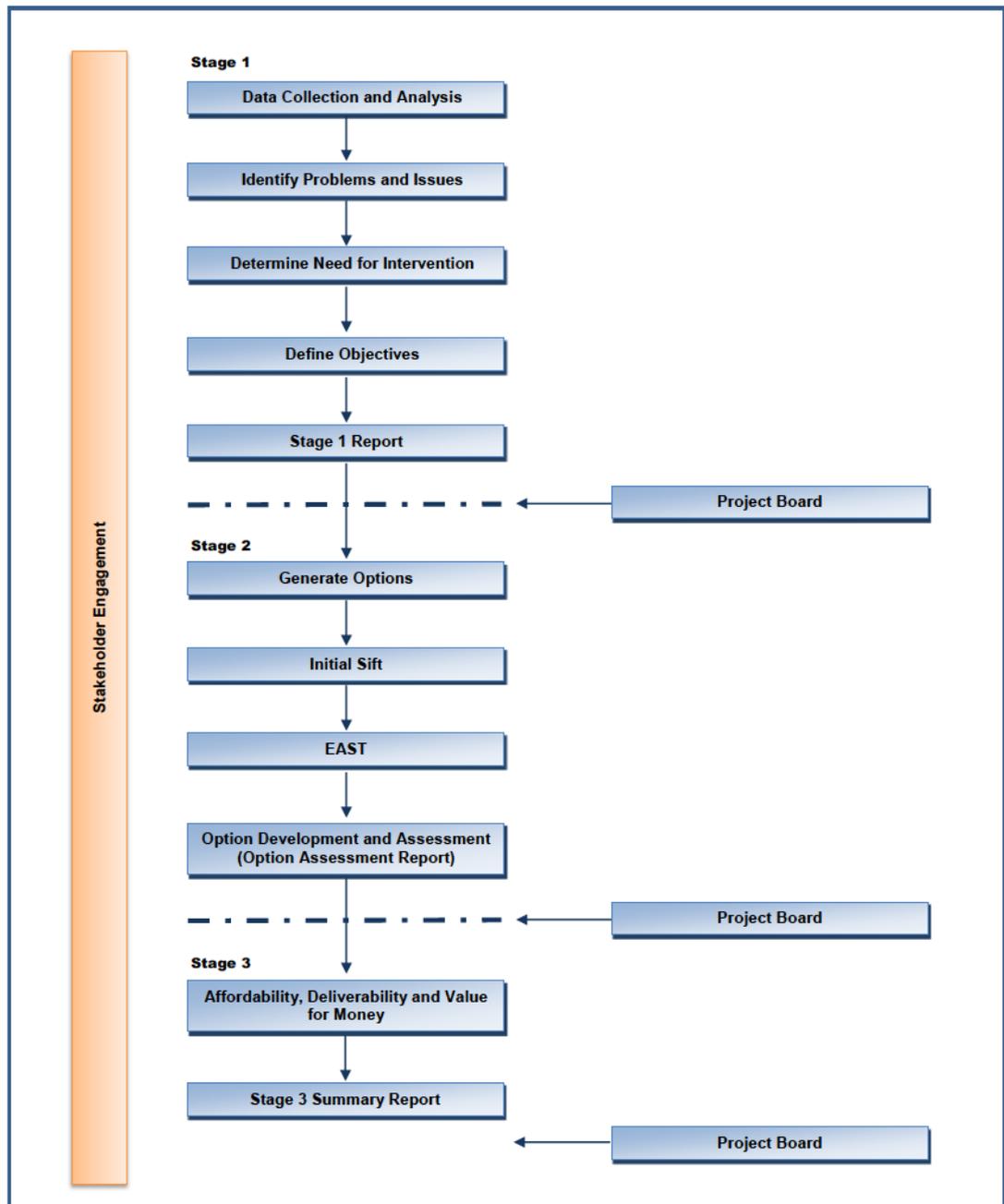


Figure 2-A Methodology Key Stages

3

Outcomes of Previous Work

Following Stage 2 of the Feasibility Study four better performing options were recommended to be taken forward for further assessment of Affordability, Deliverability and Value for Money. The four shortlisted options are presented in Table 3-A

Option	Description	Comments
Options 1 and 2 (renamed in this report as Option A)	8 miles of dualling between Morpeth and Felton (Online or Offline)	Improves most heavily trafficked single carriageway section of the route.
Option 3 (renamed in this report as Option B)	Dualling remaining sections of single carriageway on the full route of the A1 between Seaton Burn and the Scottish border (36 miles of additional dualling)	Addresses fully all problems and issues on the route. Provides a benchmark for any potential improvement
Option 4 (renamed in this report as Option C)	Dualling remaining sections of single carriageway between Seaton Burn and Ellingham (13 miles of additional dualling)	Improves most heavily trafficked single carriageway section of the route and significantly addresses problem of inconsistent carriageway standard
Option 7 (renamed in this report as Option D)	Dualling remaining sections of single carriageway between Seaton Burn and Ellingham (13 miles of additional dualling). Upgrading 19 miles of single carriageway between Ellingham and Scremerston by means of Overtaking / Climbing lanes.	Improves most heavily trafficked single carriageway section of the route and addresses problems on lightly trafficked sections to the North

Table 3-A Shortlisted Options

These options were renamed and will be referred to for the remainder of the report as follows:

- Option A: Morpeth to Felton dualling;
- Option B: Full dualling;
- Option C: Dualling to Ellingham; and
- Option D: Dualling to Ellingham with complementary measures to the north.

Option D has been slightly modified to include localised widening at junctions which had previously been considered as a separate option.

Stage 3 of the Feasibility Study has focussed in more detail on these four better performing options, aligned with the Treasury Five Case Model:

- The Strategic Case – Determining whether investment is needed, either now or in the future.
- The Economic Case – Assessing the impacts of any option and the resulting Value for Money.
- The Financial Case – Concentrating on the affordability of the proposal, its funding arrangements and technical accounting issues.

- *The Commercial Case – Providing evidence of the commercial viability of the proposal and the procurement strategy that will be used to engage the market.*
- *The Management Case – Assessing whether the proposal is deliverable*

4.1 Introduction

The Strategic Case determines whether or not investment is needed either now or in the future. It demonstrates the case for change, strategic fit and how an investment would further the aims and objectives of the organisation.

The Strategic Case largely builds on information previously presented in Stage 1: Data Collection and Analysis and the Stage 2: Option Assessment Report.

4.2 Case for Change

This element of the Strategic Case describes the case for change. By identifying problems on the route, it outlines what need will be met by the project and why it is needed now.

Problem Identification

The A1 north of Newcastle through Northumberland forms an important route between England and Scotland, especially for long distance traffic on the eastern side of the country. The route also caters for local commuters and agricultural traffic. It provides a link between England and Edinburgh, and as such has been recognised by the DfT as a route of strategic national importance.

Over the last decade the surrounding sections of the A1 have been improved. There have been significant upgrades to the A1 south of Newcastle, with many sections upgraded to motorway standard. In Scotland the A1 has also now been dualled between Edinburgh and Dunbar. However, 36 miles of single carriageway in Northumberland and 8 miles in Scotland remain.

The section of the A1 north of Newcastle (between the A19 at Seaton Burn and the Scottish border) comprises a mixture of carriageway standards along its length with a large number of at grade junctions and Private Means of Access.

The traffic flows on the A1 in Northumberland are not considered particularly high for a strategic route. The highest traffic volumes are seen on the southern sections of the route reducing quickly up to Alnwick and remaining relatively constant to the Scottish border. However, the DfT's National Transport Model's Road Traffic Forecasts predict notable traffic growth over the next 15-20 years.

Journey times by road between destinations in Northumberland and between Edinburgh and cities in northern England are considerably longer than they would be if the A1 north of Newcastle were of a higher standard. Average journey speeds between destinations along this section of the A1 are approximately 55mph. This partly reflects the lack of opportunities to overtake slower vehicles. Although these speeds are not unusual for rural roads, this is much slower than the 65+mph experienced on an uncongested dual carriageway.

A number of route sections experience slightly higher than expected numbers of accidents and / or higher than expected severity i.e. Fatal or KSI when compared to COBA national averages. Inquests into two fatal accidents have cited the mixture of standards of the road at certain locations as contributory factors.

A summary of the identified problems and issues on the route is provided below:

- **Lack of alternative routes** – One of the issues facing road users on the A1 is the lack of alternative routes once a user is north of its junction with the A697. Therefore incidents on the single carriageway sections to the North can be very problematic for strategic north-south traffic and for local users. The local road network does not lend itself well to diversion routes as the vast majority of the routes head east-west from the A1.
- **Inconsistent carriageway standards on the route** – The A1 north of Newcastle consists of a mix of highways standards, with sections at both single carriageway and dual carriageway standard. There are a total of 7 changes in carriageway between dual carriageway, single carriageway and two sections with climbing lanes. These changes in carriageway standard have been cited as a safety issue.
- **Poor junction standards/layout** – There are a number of different junction standards on the route and a number of junctions are of a poor standard or layout with issues such as poor visibility due to alignment.
- **Large number of at-grade junctions / Private Means of Access** – This can result in delays to following vehicles and potential for accidents when vehicles slow down to exit the main carriageway or are entering the main carriageway.
- **Traffic speeds** – Average speeds on the single carriageway sections of the route are significantly lower than sections that have been upgraded to dual carriageway.
- **Relatively high proportion of HGVs (and agricultural vehicles)** – This results in reduced speeds for following vehicles and potential for driver frustration.
- **Lack of overtaking opportunities** – Due to the number of HGVs and agricultural vehicles using the route the physical lack of overtaking opportunities can result in convoys of vehicles behind slow moving traffic. This can lead to driver frustration and the potential for inappropriate and unsafe overtaking manoeuvres.
- **Peak hour traffic speeds significantly below free flow speeds** – Analysis of Trafficmaster data shows that peak hour traffic speeds are significantly lower than average off-peak speeds on some sections.

Future Problems

It is likely that these problems will only be exacerbated in the future with the forecast increase in traffic volumes. This will particularly affect the issues of low traffic speeds, high proportions of HGVs, lack of overtaking opportunities and peak hour speeds being significantly below free flow speeds.

4.3 Strategic Fit

The Strategic Fit outlines how the proposed options would fit within the strategic and policy context both locally and nationally.

Economy

Any improvement to the A1 north of Newcastle will lead to improved connectivity on the eastern side of the country between the North East and Scotland and will provide a net national economic gain through the delivery of significant journey time, vehicle operating costs, safety, journey time reliability and maintenance delay benefits.

In addition any improvement should aid the economic growth of the region. Northumberland County Council have undertaken a piece of work showing that improvements to the A1 north of Newcastle would facilitate the delivery of planned housing and employment growth across the region. They have estimated that the full dualling of the remaining single carriageway sections of the A1 could lead to a potential increase of £377m to Northumberland's GVA. Even without full dualling, however, any improvement should provide some benefit to the local economy.

The Dual the A1 campaign have undertaken a survey of businesses in the North East and Scotland, in which 97% of respondents indicated that the lack of a fully dualled A1 was a key barrier to the growth of their business.

Policy Fit

The A1 north of Newcastle has been recognised by Government as a route of 'Strategic National Importance' on the eastern side of the country. Improvements to the A1 north of Newcastle would improve journey times, journey time reliability and resilience, improve safety and better connect the eastern side of the country with key economic centres in the North East and Scotland. Improvements therefore have a strong 'Strategic Fit' with a number of key policies at all levels of government such as the DfT Business Plan 2012 to 2015, the HA Goals for the Strategic Road Network, the National Infrastructure Plan, the North East Strategic Economic Plan and the Northumberland Local Plan.

There are currently plans to improve the A1 to the south of the scheme with A1 Lobley hill to Dunston improvement and A1/A19 Seaton Burn Pinch Point scheme currently being undertaken. Both of these schemes will improve access from the South into Northumberland. Any improvements to the A1 north of Newcastle would complement these schemes. The Gateshead-Newcastle Western Bypass Feasibility Study is also being undertaken to investigate the need for further improvements on the A1 as it passes this large conurbation.

At a local level there are plans to build the Morpeth Northern Bypass. This 3.8km scheme would extend east from the A1 north west of Morpeth to join the existing A197 at a roundabout north east of Morpeth. It would improve the current weaving issue on the A1 between its junction with the A192 and the A697, and also provide people to the east of Morpeth with greater ability to access the A1 for north-south movements. Any improvement to the A1 north of Newcastle would improve conditions for traffic heading north from the east of Morpeth.

It is not considered that there are any constraints posed by other committed schemes.

4.4 Investment Aims

The problems and issues identified on the route were used to define a set of specific objectives as follows:

- **Improve journey times on this route of strategic national importance** – Any improvements to the route would improve journey times by providing additional dual carriageway sections and greater ability to overtake slow moving vehicles.
- **Improve network resilience and journey time reliability** – Any improvement to the A1 would provide additional capacity to deal with incidents on the route and lead to more consistent journey times.
- **Improve Safety** – Dual carriageways are recognised as being safer than single carriageways; all improvements would lead to the provision of more dual carriageway sections on the route and as such will improve safety.
- **Maintain access for local traffic whilst improving the conditions for strategic traffic** – Any improvement to the A1 would improve conditions for strategic traffic and all shortlisted options would improve junctions to maintain local access.
- **Facilitate Future Economic Growth** – Improving the A1 north of Newcastle could facilitate the development of key sites in Northumberland and improve business in Northumberland's access to markets. Improved journey times are likely to lead to reduced business costs and improved access to employment.
- **Avoid, mitigate and compensate for potential impacts upon the built and natural environment** – While adverse environmental impacts from any improvement are likely to occur it is believed that many of these could be mitigated against through design to reduce their affect.

5 Stage 3 Outcomes – Economic Case

5.1 Introduction

The Economic Case assesses options to identify their economic, environmental, social and distributional impacts. Where possible, costs and benefits of the options are quantified and monetised. However, in line with Treasury’s appraisal requirements, the impacts considered are not limited to those directly impacting on the monetised economy, nor to those which can be monetised. Some impacts are therefore assessed qualitatively.

In assessing value for money, all of these are consolidated to determine the extent to which a proposal’s benefits outweigh its costs, with monetised impacts represented by a Benefit to Cost Ratio (BCR).

Table 5-A presents the impacts that have been assessed as part of the Economic Case.

Impact	Level of Assessment
Journey Time savings	Quantitative / Monetised Assessment
Vehicle Operating Costs	
Accident Benefits	
Journey Time Reliability	
Wider Impacts	
Scheme Costs	
Noise	Qualitative Assessment
Air Quality	
Greenhouse Gases	
Landscape	
Townscape	
Historic Environment	
Biodiversity	
Water Quality	
Physical Activity	
Journey Quality	
Security	
Access to Services	
Affordability	
Severance	
Option Values	

Table 5-A Economic Case Assessment

5.2 Options

As well as the four better performing ‘Do Something’ options identified in Stage 2, a ‘Do Minimum’ option has also been considered which assumes no changes to the existing infrastructure apart from changes that are already committed. As discussed earlier in this report, the DfT’s National Transport Model’s Road Traffic Forecasts predict notable traffic growth over the next 15-20 years, which would lead to the identified problems being exacerbated. For the purposes of this economic

assessment, this ‘Do Minimum’ scenario has been used as a baseline. The difference between the ‘Do Minimum’ and ‘Do Something’ options in terms of costs and benefits is the cost and benefit attributable to the improvement schemes and therefore the basis for assessing the Economic Case.

5.3 Monetised Impacts

During Stage 2 an early qualitative assessment of scheme benefits was undertaken to enable the sifting of the options presented in the Option Assessment Report. In Stage 3 a more detailed assessment of scheme benefits has been completed.

The following impacts were assessed as part of the Initial BCR:

- *Journey Time and Vehicle Operating Cost Benefits – These were estimated using a bespoke spreadsheet tool in line with WebTAG guidance using recorded traffic data and traffic growth forecast in the Road Traffic Forecasts 2013¹. Benefits were estimated over a 60-year assessment period and discounted to 2010 prices.*
- *Accident Benefits – These were estimated using formulae in the COBA manual and national accident rates to estimate the savings in accidents each option could generate. These were then monetised in line with values of accidents by severity published in the WebTAG Data Book. Benefits were estimated over a 60-year assessment period and discounted to 2010.*

The results of this initial economic assessment are shown in Table 5-B.

Economic Assessment	Option A (Dualling Morpeth to Felton)	Option B (Dualling Full Route)	Option C (Dualling to Ellingham)	Option D (Dualling to Ellingham with complementary measures to the north)
Journey Time and Vehicle Operating Cost Benefits	£150m	£395m	£190m	£225m
Accident Benefits	£45m	£55m	£45m	£50m
Initial Present Value of Benefits	£195m	£450m	£235m	£275m
All benefits presented to the nearest £5m in 2010 prices, discounted to 2010.				

Table 5-B Initial Economic Benefits

As would be expected, the scale of benefits increases with the scale of intervention so Option A (Morpeth to Felton Dualling) provides the lowest benefits while Option B (Full Dualling) provides the highest level of benefits as dualling the whole route provides the greatest benefit to the greatest number of users.

At this early stage of scheme development the estimation of scheme benefits has assumed fixed demand / no traffic transfer from other routes. However, it is recognised that there is potential for strategic traffic to transfer from the A697 onto the A1 should the full route be at dual carriageway standard, leading to additional user benefits that are currently not being captured. As such any future estimation of

¹ At the time of this assessment Road Traffic Forecasts 2013 was the most recent forecast available. Any future work should make use of the most recent forecasts.

benefits should aim to capture these additional benefits using variable demand modelling.

There are further benefits that can be monetised and included within an Adjusted BCR. These are benefits which are not always captured in the standard Transport Appraisal Process as there is less certainty about the evidence base used to derive the monetary values. Nonetheless, they are recognised as providing potential additional benefits to the scheme. The following additional impacts have been monetised:

- *Journey Time Reliability – This has been monetised in line with “Value for Money Assessment: Advice Note for Local Transport Decision Makers 2013”*
- *Wider Impacts – Two of the three Wider Impacts have been monetised these are:*
 - *Agglomeration – A large section of the A1 (as far north as Alnwick) is within the hinterland of the Tyne and Wear Functional Urban Region, as identified by the DfT. Significant agglomeration benefits can therefore be expected. Agglomeration impacts arise because firms derive productivity benefits from being closer to one another. These benefits have been estimated using an “elasticity” to estimate GVA uplift per job which was used as a proxy for Agglomeration.*
 - *Output change in imperfectly competitive markets – A reduction in transport costs brought about by a transport improvement can facilitate increased production, which is valued more highly by consumers than the cost of producing this output. This leads to additional benefits that are not captured in the traditional cost benefit analysis. In line with WebTAG guidance, this has been estimated as 10% of Business User Benefits.*

As discussed in detail in the Financial Case chapter of this report, cost estimates were derived by the Highways Agency for both online and offline variants of any option, with the offline cost being higher than the online cost. For comparison with scheme benefits within the Economic Case, these costs were adjusted in line with standard Treasury appraisal guidance (e.g. conversion to 2010 market prices, discounting to 2010).

The monetised costs and benefits are used to calculate an adjusted BCR as shown in Table 5-C:

Economic Assessment	Option A (Morpeth to Felton Dualling)	Option B (Full Dualling)	Option C (Dualling to Ellingham)	Option D (Dualling to Ellingham with complementary measures to the north)
Initial Present Value of Benefits	£195m	£450m	£235m	£275m
Journey Time Reliability	£15m	£75m	£20m	£45m
Wider Impacts	£30m	£75m	£35m	£35m
Adjusted Present Value of benefits	£240m	£600m	£290m	£355m
Present Value of Costs	£115m-£180m	£500m-£840m	£175m-£300m	£205m-£330m
BCR	1.3-2.1	0.7-1.2	1.0-1.7	1.1-1.7
All costs and benefits presented to the nearest £5m in 2010 prices and are discounted to 2010 in line with WebTAG guidance. For each option, the lower cost represents an online variant, while the higher cost represents an offline variant.				

Table 5-C Adjusted BCR

The scale of benefits increases with the scale of intervention. However, due to their high cost, large scale interventions such as Option B (Full Dualling) can present a lower BCR than smaller scale interventions.

5.4 Non Monetised Impacts

Some impacts have not been monetised at this stage of development, including environmental and social impacts. However, these impacts still contribute to the overall Economic Case. Details of how these impacts have been considered are presented below.

Following the environmental assessment of options presented in the Stage 2 Option Assessment Report the shortlisted options have been assessed on their likely environmental impacts based on a conceptual alignment for online and offline variants. A summary is provided in Table 5-D.

Impact	Option A (Morpeth to Felton Dualling)		Option B (Full Dualling)		Option C (Dualling to Ellingham)		Option D (Dualling to Ellingham with complementary measures to the north)	
	Online	Offline	Online	Offline	Online	Offline	Online	Offline
Noise								
Air Quality								
Greenhouse Gases								
Landscape								
Townscape								
Historic Environment								
Biodiversity								
Water Environment								
	<div style="display: flex; flex-direction: column; gap: 5px;"> <div> Likely to have large beneficial Impact</div> <div> Likely to have beneficial impact</div> <div> Likely to have neutral/minimal impact</div> <div> Likely to have adverse impact</div> <div> Likely to have large adverse impact</div> </div>							

Table 5-D Environmental Impacts

The assessment of social impacts has remained unchanged from that presented in the Stage 2 Option Assessment Report as these elements of the assessment were considered appropriate to this stage of scheme development. A summary is presented in Table 5-E.

Impact	Option A (Morpeth to Felton Dualling)	Option B (Full Dualling)	Option C (Dualling to Ellingham)	Option D (Dualling to Ellingham with complementary measures to the north)
Physical Activity				
Journey Quality				
Security				
Access to Services				
Affordability				
Severance				
Option Values				
	<div style="display: flex; flex-direction: column; gap: 5px;"> <div> Likely to have large beneficial Impact</div> <div> Likely to have beneficial impact</div> <div> Likely to have neutral/minimal impact</div> <div> Likely to have adverse impact</div> <div> Likely to have large adverse impact</div> </div>			

Table 5-E Social Impacts

6

Stage 3 Outcomes – Financial Case

The Financial Case concentrates on the affordability of the proposal, its funding arrangements and technical accounting issues. It presents the financial profile of the different options and the impact of the proposal on the Department’s budgets and accounts.

Scheme cost estimates have been prepared by HA Commercial. The HA employed cost estimating specialists Benchmark to develop cost estimates for each of the shortlisted options. These costs have been estimated using outline conceptual designs; should any scheme be taken forward costs would need to be re-evaluated following detailed design.

HA Commercial have applied a risk-based approach to developing these costs and therefore present a P10, P50 and P90 estimate (respectively 90%, 50% and 10% probability that the costs will exceed the values presented). The P50 costs have been used in both the Economic and the Financial Case.

The costs estimates for each option are summarised in Table 6-A. These outturn costs contain an adjustment for delivery risk, optimism bias and inflation.

It should be noted that the costs presented below also form the basis for those costs used in the Economic Case. The adjustments made for that purpose are discussed in the Economic Case chapter of this report, and are in line with Treasury guidance. The costs presented in the Economic Case and Financial Case both therefore represent the cost of the scheme, but are used for different purposes and should not be used interchangeably.

	Option A (Morpeth to Felton Dualling)	Option B (Full Dualling)	Option C (Dualling to Ellingham)	Option D (Dualling to Ellingham with complementary measures to the north)
Cost	£165m-£255m	£720m-£1,195m	£250m-£430m	£290m-£465m
Costs vary depending on whether the scheme is online or offline.				

Table 6-A Cost Estimates

It is anticipated that the funding of any option taken forward would be provided from DfT budgets.

As would be expected, the Full Dualling option (Option B) is the most expensive option while the smallest intervention, Morpeth to Felton Dualling (Option A) is the least expensive.

The Commercial Case provides evidence on the commercial viability of a proposal and the procurement strategy that will be used to engage the market. It clearly sets out the financial implications of the proposed procurement strategy and presents evidence on risk allocation and transfer, contract timescales and implementation timescales.

If any scheme was to be taken forward it would likely be managed under the HA's Project Control Framework (PCF) and could enter at PCF Stage 1 (Option Identification), the key outputs/deliverables of this stage would be:

- *To identify the options to be taken to public consultation;*
- *Assess options in terms of environment impact, traffic forecasts and economic benefits;*
- *Refine the cost estimate of options;*
- *Appraisal Specification Report;*
- *Options Estimate;*
- *Economic Assessment Report;*
- *Traffic Forecasting Report;*
- *Technical Appraisal Report;*
- *Statement of Intent;*
- *Public Consultation Strategy;*
- *Statutory Undertaker Estimates; and*
- *Departures from Standards Checklist.*

Interim Stage Gate Assessment Review (SGAR) and SGAR 1 at the end of Stage 1 will measure the success of the project and will provide evidence for the Senior Responsible Owner (SRO) and key stakeholders on the continued viability (or not) of the project

Any scheme taken forward could be procured through the HA's upcoming Collaborative Delivery Framework (CDF) which has been designed for major projects with a cost of greater than £15m. The principles of the CDF are to achieve continuous improvement in health and safety, sustainability, quality, time and cost.

Due to the size and nature of projects that may be procured, the HA has split the framework into four lots (one design and three construction). The lot structure should stimulate development and provide opportunities to encourage entry by suppliers with a broad range of capabilities.

Financial governance will be in accordance with the Highways Agency Investment Control Framework. Payment will be made in accordance with the terms and conditions of the CDF contracts and within the targets set out in the Governments Prompt Payment Initiative.

8 Stage 3 Outcomes – Management Case

8.1 Introduction

The Management Case assesses whether a proposal is deliverable. It tests the governance structure, project planning, risk management, communications and stakeholder engagement, benefits realisation and assurance.

All the shortlisted options are considered deliverable from an engineering perspective and there is a clear governance structure that any scheme taken forward could follow.

8.2 Project Governance

Any scheme taken forward would be governed by a Project Board. The Project Board includes the SRO, Senior User and Senior Supplier. The board would be supported by the Project Manager and various technical specialists from the Highways Agency and supply chain at the request of the SRO. The Project Board would be appointed as part of project setup.

Assurance for the project will be carried out under the Highways Agency Investment Control Framework (ICF) processes, Highways Investment Board, and internal Major Project procedures, such as the Project Control Framework.

On entry to the PCF the scheme would be subject to peer reviews and audits such as OGC Gateway Reviews and Stage Gate Assessment Reviews.

8.3 Project Plan

As any scheme would be managed under the HA’s PCF there are clear stages for the schemes to follow, some of these stages can be run in parallel thus speeding up the delivery of any scheme.

- *PCF Stage 1: Options Identification*
 - *PCF Stage 2: Options Selection*
 - *PCF Stage 3: Preliminary Design*
 - *PCF Stage 4: Statutory Procedures and Powers*
 - *PCF Stage 5: Construction Preparation*
 - *PCF Stage 6: Construction, Commissions and Handover*
 - *PCF Stage 7: Closeout*
- } Options Phase
- } Development Phase
- } Construction Phase

The Options Phase is likely to last for approximately 18 months.

For Options A, C and D, the Development Phase is likely to last 3.5 years and the Construction Phase 3 years. The duration is the same for all three of these schemes as it is assumed construction works on different sections could be carried out in parallel.

As Option B (Full Dualling) is a larger scheme, these phases will take slightly longer. The Development Phase is likely to last 4 years, and the Construction Phase 4.5 years.

8.4 Risk Management

A proportionate level of assessment has been undertaken, at an appropriate level of detail for a feasibility study.

The key risks are:

- *The findings of the feasibility study are indicative; there is therefore a risk that the value for money assessment and BCR calculation could change as a result of further assessment using a detailed transport modelling tool in the next stage.*
- *Detailed design may identify issues which mean that the concept is not deliverable as it stands.*
- *The forecast cost of the scheme identified by the feasibility study is an order of magnitude estimate. There is therefore a risk that the costs are likely to change when the solution is designed.*
- *The assessment of the technical feasibility and deliverability of options undertaken as part of the feasibility study is heavily reliant on engineering judgement and may change as a result of further assessment.*
- *Lands cost estimates have been prepared as a desk top exercise as part of the feasibility study. There is a risk that the costs and time associated with acquiring land may change as a result of further consideration in the next stage.*
- *Broad assumptions have been made about the time required for acquiring land and following statutory planning processes (where applicable). Therefore there is a risk that these processes will take longer and be more costly than have been assumed, once these issues are considered in more detail.*

On entry to the PCF, a risk workshop would be held to identify the delivery risks to the scheme.

8.5 Communications and Stakeholder Management

There would be a requirement to conduct formal consultation with the public to confirm the preferred route. Further consultation with statutory bodies will also be required at key milestones in line with best practice and statutory procedures. Consultation with statutory undertakers has not been undertaken as part of the feasibility study and would be carried out in PCF stage 1.

8.6 Benefits Realisation

The main scheme benefits and how they can be measured and monitored are listed below:

- **Journey Time Savings:** *can be measured through data collected by HA and stored within HATRIS journey time database.*
- **Journey Time Reliability Improvements:** *can be measured through data collected by HA and stored within HATRIS journey time database allowing the level of day to day variations to be assessed.*
- **Accidents:** *can be measured through the collection of accident statistics.*

9.1 Introduction

WebTAG guidance does not prescribe the exact level of assessment to be undertaken for a feasibility study. Rather, the guidance recommends the use of existing transport models and data and that the assessment should be predominantly desk based.

It is therefore considered that the assessment undertaken within this feasibility study is adequate for this stage of assessment and that the information provided is sufficient for scheme investment decisions to be reached.

However, there is always scope to further improve the robustness of a scheme assessment and so this section covers the additional work that could be undertaken to provide additional confidence in the scheme assessments. This is split into three main areas:

- **Traffic Modelling:** refinements that could be made to the traffic modelling undertaken to assess the scheme benefits and any additional modelling that could be done;
- **Environmental Impacts:** further quantification of environmental impacts; and
- **Other impacts:** suggested approach to quantifying other scheme impacts or increasing detail of current quantification.

9.2 Traffic Modelling

Due to the lack of available modelling tools that are fit for purpose for the assessment of improvements to the A1 north of Newcastle, a spreadsheet approach was adopted to estimate scheme benefits.

Whilst this approach is sufficient for the feasibility study stage, the development of a new traffic model could be considered to add further robustness to the forecasts produced in the feasibility study. This would be a requirement if any scheme was progressed beyond this study.

In line with WebTAG this would require the development of fully validated and calibrated base and forecast models and would incorporate Variable Demand Modelling (VDM) to allow the assessment of likely changes in overall traffic levels due to changes in the cost of travel.

At this stage it is not possible to define the geographic extent of any new model as the four shortlisted options vary greatly in terms of their extents.

9.3 Environmental Impacts

The environmental assessment undertaken for this feasibility study has been desk based and no surveys have been carried out on site. To further refine the environmental assessment more detailed surveys would be required which moves the assessment away from the desk based study recommended by the guidance for the feasibility study stage.

Following the development of a traffic model detailed model outputs could be used to further assess the noise and air quality impacts of the scheme.

9.4 Other Impacts

Following the production of a traffic model, more detailed quantified assessments of various impacts could be undertaken. These include:

- *Use of TUBA software to assess journey time and vehicle operating cost impacts on business, consumer and other users;*
- *Use of COBA-LT software to assess the impact on accidents;*
- *Use of QUADRO software to assess the impact of user delay benefits during construction and maintenance;*
- *Use of MyRIAD software to assess journey time reliability benefits.*

There are also detailed WebTAG methodologies for monetising a number of other scheme impacts such as:

- *Physical Activity;*
- *Regeneration; and*
- *Journey Quality.*

Whilst including these is unlikely to lead to a significant change to the value for money of each scheme, they can be quantified to provide further robustness to the economic assessment.

The methodology and emerging findings of Stage 3 of the study were presented to the Stakeholder Reference Group on 03/11/14 at Morpeth Town Hall. This was attended by the Stakeholder Reference Group (SRG) consisting of representatives from the

- *Northumberland Wildlife Trust*
- *Parliamentary Office for Berwick-upon-Tweed*
- *Dual the A1 campaign*
- *North East LEP*
- *North East Combined Authority*
- *Northumberland County Council*
- *Natural England*
- *Newcastle City Council*
- *Department for Transport*
- *Highways Agency*
- *Jacobs*

The workshop was structured around a presentation summarising Stage 3 of the Feasibility Study (as presented within this report) with clear break points to allow for open discussion and debate on the findings of the work.

The presentation began with a recap of the background to the Feasibility study and the key outcomes of Stages 1 and 2 which had previously been endorsed by the SRG on 21/05/14 and 21/08/14.

The approach to Stage 3 of the study and fit with the Treasury Five Case model was presented along with the approach to traffic modelling adopted to assess benefits. The SRG agreed that this was considered appropriate.

The emerging findings of Stage 3 were then presented, outlining how the investment cases for the four options performed against the Treasury Five Case model. The SRG acknowledged that, as expected, the larger schemes had greater impacts but for a greater cost thus impacting upon their potential value for money. Following discussions, the Stage 3 findings were endorsed by the SRG.

11 Fulfilment of Scope

11.1 Summary of Scope

The overall aim of the A1 North of Newcastle Study is as follows:

“To establish the potential business case for dualling the remaining sections of the A1 north of Newcastle, and to consider potential economic cases for other transport investment opportunities on the route.”

Alongside this a set of study objectives were defined:

- *Identify and assess the economic business case, deliverability and timing of proposals to complete the dualling of the A1 North of Newcastle.*
- *Identify and assess the economic business case, deliverability and timing of potential specific road infrastructure investments along the A1 corridor north of Newcastle.*
- *Understand the comparative balance of benefits and impacts from individual investment proposals and any additional benefits or impacts from an investment on a corridor basis.*
- *Evidence where possible, the wider economic impacts from potential road infrastructure investment on the A1 corridor.*

11.2 Fulfilment of Scope

It was anticipated that meeting these objectives would answer a number of questions outlined in the document. Answers to these questions are provided in Table 11-A.

Question in Scope	Response
1. Given an assessment of the current and future performance of the A1 North of Newcastle, is there an economic case for dualling the remaining sections of the route.	Indicative economic analysis, using readily available data sources and tools, demonstrates that dualling all remaining single carriageway sections of the A1 NoN could deliver significant user and economic benefits. However, given the scale of the intervention and existing and forecast traffic volumes on the route, it is unlikely that user benefits would significantly outweigh scheme costs resulting in Poor to Low Value for Money when assessed against Treasury guidelines.
2. With an updated analysis of costs and benefits are there now economic cases for potential road investments on the A1 North of Newcastle that are deliverable and demonstrate value for money?	The feasibility study identified 3 other interventions that could deliver significant user benefits and Value for Money. These are: <ul style="list-style-type: none"> - Dualling the A1 between Morpeth and Felton - Dualling the remaining single carriageway sections of the A1 as far as Ellingham - Dualling the remaining single carriageway sections of the A1 as far as Ellingham with complimentary measures to the north.
3. What are the potential timescales for the delivery of identified potential solutions?	Delivery programmes have been developed for the four shortlisted options. The delivery timescale is anticipated to be between eight and ten years.

Question in Scope	Response
4. Are there additional benefits or impacts from combinations of potential solutions over and above those for individual solutions?	Combinations of potentials options were identified in stage 2 of the study and taken through a robust sifting process to the point where three of the four shortlisted options are combinations of interventions on sections of the route.
5. Have the potential solutions identified fully considered and optimised the environmental opportunities potential transport investment could bring?	An assessment of the environmental impacts of each scheme has been undertaken. It is acknowledged that the environmental impacts of each option are likely to be negative, however, it is believed that these impacts could largely be mitigated against during the design phase.
6. To what extent do the proposed road investments provide wider economic impact in terms of facilitating growth or improved connectivity?	The Wider Impacts of each option have been considered as part of the economic assessment. These Wider Impacts are Agglomeration, Output Change from Imperfectly Competitive Markets and Tax Revenues from Labour Market Impacts. Northumberland County Council have also produced a report in support of the dualling of the A1 which suggests that the full dualling of the A1 could lead to £377m of GVA being added to Northumberland's economy.
7. To what degree do the potential options for investment address issues around the resilience of the A1 North of Newcastle and/or address issues around the safety performance of the route?	The resilience of the route is likely to improve with all of the options, with the additional capacity provided by dualling enabling lane closures to have a less significant effect on travellers. All options shortlisted are likely to have a significant impact on the safety of the route.
8. Is further work/analysis required for Government to be able to make specific investment decisions, and if so what are the timescales of such work?	The work produced during stage 3 represent the level of information that ministers would expect to see in order to make an informed decision on whether to progress into scheme development and detailed appraisal stages.

Table 11-A Fulfilment of Scope

In conclusion it is believed that the scope of the A1 North of Newcastle Feasibility Study has been fulfilled, and that the study presents the level of information that ministers would expect to see in order to make an informed decision on whether to progress into scheme development and detailed appraisal stages.

The following conclusions have been made on each scheme:

Option A – Morpeth to Felton Dualling

This scheme could deliver a BCR of between 1.3 and 2.1, addresses the problems and issues on the most heavily trafficked single carriageway section of the route and would create a consistent carriageway standard as far north as Alnwick. However, it could deliver the lowest overall benefits of all four options as it only improves a single section of the A1.

Option B – Full Dualling of the A1 between Seaton Burn and the Scottish Border

This scheme could deliver a BCR of between 0.7 and 1.2, but would fully address the problems and issues on the route, providing a consistent carriageway standard to the Scottish border. As would be expected this option could deliver the highest level of benefits of all four shortlisted options, however, it would also be considerably more expensive than any other option.

Option C – Dualling to Ellingham

This scheme could deliver a BCR of between 1.0 and 1.7 and would address the problems and issues on the most heavily trafficked single carriageway section of the route while providing a consistent carriageway standard as far north as Ellingham. As would be expected this option could deliver larger benefits than Option A but would also be more expensive.

Option D – Dualling to Ellingham with complementary measures to the north

This scheme could deliver a BCR of between 1.1 and 1.7, and would address the problems and issues on the most heavily trafficked single carriageway section of the A1 while providing a consistent carriageway standard as far north as Ellingham and could also improve conditions for traffic on the more lightly trafficked northern sections. As would be expected this option could deliver larger benefits than Option C but would also be more expensive.