HIGHWAYS AGENCY

A1 Newcastle Gateshead Western Bypass

Stage 2: Option Assessment Report

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WSP

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Executive Summary

The A1 Newcastle Gateshead Western Bypass (NGWB) is one of the most congested highway links in the North-East Region with more than 110,000 vehicles using the route every day on the busiest section. As a result of this travel demand on the route there are a number of issues relating to: journey time delays; journey time reliability; route resilience; safety; environmental impacts and development pressures.

Improvements to the A1 NGWB have long been acknowledged as a requirement for economic growth in the region within both local and national policy documents and reflected in the consensus of opinion amongst regional stakeholders that something needs to be done to address the issues. The route has been identified as a 'hot-spot' requiring Government investment to deliver infrastructure improvements.

Traffic in the region is forecast to grow in the future, largely due to a number of proposed development sites to be delivered through the Newcastle / Gateshead Local Plan. This additional traffic demand will further exacerbate the issues on the A1 NGWB with traffic modelling work indicating the likely extent of the impacts.

Currently committed improvement schemes such as the Coalhouse to Metrocentre and Seaton Burn Pinch Point schemes aim to tackle the issues on certain parts of the route. Local authority schemes to improve the local road network in the region and increase public transport provision and service quality aim to benefit the portion of trips occurring off the strategic road network and provide an alternative to car use. However, these schemes are unlikely to resolve all of the issues across the whole route so there is an urgent need for intervention in a number of areas outside of the Coalhouse to Metrocentre scheme extents.

Identification of the priority sections of the route using evidence gathered on the current and future situation highlights the highest priorities for intervention as being: J65 – J67 (Birtley to Coalhouse including Allerdene Railway Bridge); J71 – J73 (Metrocentre to Derwenthaugh); and J74 – J79 (Scotswood to North Brunton).

Interventions to tackle the identified issues on these sections of the route (as well as some of the lower priority sections) are developed with reference to previous studies and stakeholder input. The potential interventions take the form of: widening works; junction closure / changes; provision of technology; speed reduction measures; and provision for handling emergencies.

Sifting of the generated interventions is undertaken by assessing the likely level of impact each intervention will have against the objectives of tackling the issues on the route. Packages of interventions that are shown to significantly tackle the issues and be feasible and deliverable are further assessed using the EAST process which involves qualitatively scoring the options against a number of objectives and impacts: strategic; economic; managerial; financial; and commercial.

The resultant list of mainline options that are assessed in Stage 2: Option Assessment is as follows:

- 1B: Widening to three lanes between J65 – J67 including provision of new offline structure to replace Allerdene bridge and new Coalhouse junction
- 2A: Widening to three lanes between J71 – J73 including closure of J72 (Swallwell slips);
- 2C: Widening to three narrow lanes between J71 – J73 including closure of J72 (Swallwell slips), requires 50mph speed limit over this section;

- 4-6A: Widening to three lanes between J74 – J79 including lane gain / lane drop arrangement between junctions;
- 4-6C: Widening to three narrow lanes between J74 – J79 including lane gain / lane drop arrangement between junctions on the J74 – J77 section. Requires 50mph speed limit over this portion of the route; and
- Technology Option: Motorway Incident Detection and Automated Signalling (MIDAS), Variable Message Signs (VMS) and Closed Circuit Television Cameras (CCTV) provision for the whole route.

The following junction interventions were also assessed during Stage 2: Options Assessment:

- Junction 62: Widening of northbound diverge slip to three lanes;
- Junction 64: Widening of northbound on-slip to two lanes;
- Junction 65: Extend existing three lanes at approach to stop/give way line on the southbound diverge slip onto A1231;
- Junction 66: Full signalisation of junction and additional lanes on slip roads;
- Junction 68: Widening northbound off slip to three lanes;
- Junction 71: Widening of diverge slips to three lanes at southbound approach to Hollinside Road stop/give way line;
- Junction 72: Closure of Swallwell slip roads (in absence of Option 2A or 2C); and
- Junction 79: Widening of A1 northbound diverge slip road to three lanes at approach to stop line on nearside and offside. Extend A1 southbound diverge slip roads to three lanes at approach to stop line.

The Option Assessment Framework involves qualitative scoring of the impacts each of the options will have in a number of areas. Where applicable, evidence for the scoring has been obtained from traffic modelling and environmental specialists, while costs have been developed by HA commercials. An estimate of the likely Value for Money score of the options has been produced using this information.

As a result of the option assessment process Options 2A and 4-6A have been discarded as the additional cost required to deliver these schemes is much greater than the additional benefit they provide over their lower cost counterparts (2C and 4-6C). Furthermore the intervention at Junction 64 has been discarded due to the low value for money of the scheme caused by the high cost associated with the structures works required to deliver this option.

The remaining options are to be taken forward to Stage 3 of the study which is the production of Strategic Outline Business Cases for these options. This includes more detailed quantification of benefits and value for money assessment, as well as identification of the additional appraisal work required to reach a decision on whether to progress the options.

1 Introduction and Purpose

1.1 Introduction

1.1.1 The aim of this feasibility study is to identify the opportunities and understand the case for future investment solutions on the A1 Newcastle Gateshead Western Bypass (NGWB) that are deliverable, affordable and offer value for money.

1.1.2 The study is split into three stages, the second of which is reported here. These are:

- Stage 1: Review of evidence and identification of problems and issues;
- Stage 2: Finalise the range of proposals that could address the identified problems and issues; and
- Stage 3: Assess the affordability, value for money and deliverability of the proposals.

1.1.3 This report covers Stage 2 of the study and should be read in conjunction with the Stage 1 Report.

1.2 Stage 2 Objectives

1.2.1 The purpose of Stage 2 of the study is to identify and sift interventions that tackle the issues identified in Stage 1 whilst meeting the study objectives. The following steps are involved:

- Identification of interventions;
- Two stage sifting process to assess potential options using a pre-sift tool and EAST;
- Potential options to be subjected to a more detailed appraisal using the Option Assessment Framework (OAF); and
- Production of an Option Assessment Report (OAR) with recommendations for options to be taken forward to Stage 3: SOBC.

1.3 Report Structure

1.3.1 This OAR is structured as follows:

- **Chapter 2: Prioritisation for Intervention**: describes current and future problems and challenges and identifies and prioritises the need for interventions on the route
- **Chapter 3: Generation of Options**: summarises the process undertaken to generate the intervention options;
- **Chapter 4: Initial Sifting**: provides a description of the intervention sifting process including the EAST assessment, and details the interventions taken forward for further assessment;

- **Chapter 5: Development & Assessment of Potential Options**: contains the appraisal of the interventions in line with the OAF and an outline of the appraisal tools used for this assessment; and
- **Chapter 6: Conclusions & Recommendations**: recommendations on the interventions to take forward to Stage 3: SOBC.

2 Prioritisation for Intervention

2.1 Introduction

2.1.1 Chapter 2 of this report draws on the findings of the analysis undertaken in Stage 1 of the study to determine the key issues that the intervention options are to tackle and the relative priority each section of the route is given for intervention.

2.2 Summary of Current Highway Network Performance – A1 Mainline

2.2.1 The highway network performance data, provided by the RIU and presented in the Stage 1 report, is summarised by route section in Table 2-1. Where possible, this data is contrasted against regional or national benchmarks, to better illustrate the operational circumstances of the A1 NGWB. This was not possible in the case of pedestrian incidents, incidents involving a lane closure and breakdowns. Appendix A of the Stage 1 Report presents a detailed Node and Link summary of these current issues along with the future impacts of traffic growth based on the evidence presented in the next section of this chapter.

Study Section	Link	Comparison to EU Limit		Absolute Value					
		Air Quality		Pedestrian Incidents		Lane Closures (Number of Incidents)		Breakdowns per km	
		NB	SB	NB	SB	NB	SB	NB	SB
1	A1 Birtley - Eighton Lodge			5	3	4	3	5	2
	A1 Eighton Lodge - Coalhouse*			3	1	1	1	3	3
2	A1 Metro Centre - Bridge crossing River Derwent†			5	1	4	1	5	3
	A1 Bridge crossing River Derwent - Derwenthaugh^			4	4	4	2	5	3
3	A1 Derwenthaugh - Scotswood^			4	4	4	2	5	3
4	A1 Scotswood - Denton Island			4	4	4	5	3	4
5	A1 Denton Island - Stamfordham Road			4	5	2	5	2	5
	A1 Stamfordham Road - Ponteland Road			3	5	3	5	4	5
6	A1 Ponteland Road - North Brunton			4	5	2	5	4	5
7	A1 North Brunton - Seaton Burn			5	4	5	4	5	5

Categorisation				
	Above EU Limit	> 15	> 100	> 100
		10 to 15	50 to 100	75 to 100
		5 to 10	30 to 50	50 to 75
	Below EU Limit	1 to 4	10 to 30	25 to 50
		0	0 to 10	<25

Study Section	Link	Comparison to North of England Benchmark													
		Annual Average Daily Traffic		Average Monthly Vehicle Hour Delay		Reduced Capacity Hours		Reliability		KSI Casualties per km		Casualties per Billion Vehicle Miles		Road Traffic Collisions per km	
		NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
1	A1 Birtley - Eighton Lodge	2	2	4	1	5	1	5	5	1	1	3	1	4	4
	A1 Eighton Lodge - Coalhouse*	3	3	1	1	5	2	3	3	1	1	2	3	4	4
2	A1 Metro Centre - Bridge crossing River Derwent†	2	3	3	1	5	1	2	1	2	3	3	4	3	4
	A1 Bridge crossing River Derwent - Derwenthaugh^	3	5	3	1	5	2	3	2	4	5	5	4	3	3
3	A1 Derwenthaugh - Scotswood^	3	5	3	1	5	2	3	2	4	5	5	4	3	3
4	A1 Scotswood - Denton Island	2	3	3	2	5	4	3	3	5	5	3	4	1	1
5	A1 Denton Island - Stamfordham Road	2	3	3	3	5	5	2	3	1	5	1	3	5	5
	A1 Stamfordham Road - Ponteland Road	3	4	4	3	5	3	3	3	2	3	3	4	2	5
6	A1 Ponteland Road - North Brunton	4	5	4	3	5	3	3	3	3	3	4	4	4	4
7	A1 North Brunton - Seaton Burn	5	5	5	4	4	5	5	2	3	4	4	4	5	5

Categorisation							
	> Avg > 30000	> 4000	> Avg > 6%	< Avg > 15%	> Avg >1	> Avg 400+	> Avg 1.5+
	> Avg 25 to 30000	3000 to 4000	> Avg 4 to 6%	< Avg 10 to 15%	> Avg 0.5 to 1	> Avg 200 to 400	> Avg 1 to 1.5
	> Avg 20 to 25000	2000 to 3000	> Avg 2 to 4%	< Avg 5 to 10%	> Avg up to 0.5	> Avg up to 200	> Avg 0.5 to 1
	> Avg 15 to 20000	1000 to 2000	> Avg up to 2%	< Avg < 5%	< Avg up to 0.5	< Avg 0 to 200	> Avg up to 0.5
	> Avg up to 15000	<1000	< Avg	> Avg	< Avg > 0.5	< Avg > 200	< Avg

Table 2-1: Current Situation Performance Indicators

2.2.2 The key current issues identified by the highway network performance data for each section are summarised in Table 2-2.

Section	Link	Performance
1	J65 Birtley – J66 Eighton Lodge	• Peak period delays in southbound direction • High accident rates
	J66 Eighton Lodge – J67 Coalhouse	• Large delays in both directions • High accident rates causing reliability issues • Large number of incidents leading to lane closures
2	J71 Metrocentre – Derwent Bridge	• Southbound delays • Relatively high accident rates leading to reliability problems • Poor air quality
	Derwent Bridge – J73 Derwenthaugh	• Southbound delays • Relatively high number of collisions leading to reliability issues • Poor air quality
3	J73 Derwenthaugh – J74 Scotswood	
4	J74 Scotswood – J75 Denton Island	• Delays • High number of collisions • Poor air quality
5	J75 Denton Island – J76 Stamfordham Road	• Moderate delays • High number of KSIs • Poor reliability • Poor air quality
	J76 Stamfordham Road – J77 Ponteland Road	• Moderate delays • Some accident issues
6	J77 Ponteland Road – J79 North Brunton	• Moderate delays • Poor air quality
7	J79 North Brunton – J80 Seaton Burn	• Some accident issues

Table 2-2: Summary of section performance

2.3 Summary of Current Highway Network Performance – A1 Junctions

2.3.1 The RIU data focusses on the A1 mainline so therefore does not provide detailed information on the current operation of the junctions. Whilst the non-mainline elements of the NESMM model are not validated in detail this still provides an indication of the operation of the A1 junctions. The summary of junction performance in Table 2-3 is based on examination of the model and indications of performance obtained from informal stakeholder discussions, with further information provided in Appendix A of the Stage 1 report.

Junction	Performance
J62: Carrville	• AM peak queues on approaches
J63: Chester-le-Street	• AM peak queues on approaches
J64: Washington	• No notable issues
J65: Birtley	• Queues back onto Sunderland Highway in AM peak due to A1 mainline congestion • In PM peak queues from Lookout Lake roundabout impact junction
J66: Eighton Lodge	• Extensive queuing on Durham Road in AM peak
J67: Coalhouse	• Extensive queuing on Lamesley Lane in AM peak • Extensive queuing on Kingsway in PM peak
J68: Lobley Hill	• Extensive queuing on A692 & B4126 during peaks • Queuing from Maingate roundabout extends to junction
J69: Askew Road	• Queuing on A184 approach in peaks due to mainline congestion
J70: Dunston	• No notable issues
J71: Metrocentre	• AM peak queuing on Hollinside Road NB
J72: Swallwell	• No notable issues
J73: Derwenthaugh	• No notable issues
J74: Scotswood	• Queuing back from A695 onto SB off slip in AM peak
J75: Denton Burn	• Extensive queues on A69 and A186 arms in peaks.
J76: Stamfordham	• Some queuing observed on Stamfordham Road approaches and slip roads in peaks
J77: Ponteland Road	• Queuing observed on B6918 arm in peaks
J78: Kingston Park	• No notable issues
J79: North Brunton	• Queuing from A1056 impacts junction in PM peak • Some queues on other arms including slip roads
J80: Seaton Burn	• Congestion at Fisher Lane roundabout adjacent to junction leads to peak queuing back onto A1 mainline

Table 2-3: Junction Performance

2.4 Summary of Future Highway Network Performance

2.4.1 The development plans reviewed in the Stage 1 report lead to a concentration of development in the A1 NGWB corridor. This will increase demand for travel both along the SRN itself, and critically, through the intersecting junctions. The operation of 16 junctions within the 25km of the bypass is critical to the operation of the mainline SRN. Slip roads are, given the tight nature of the corridor, short, and any issues at the intersections at the top of the slips will quickly spill back to impact on the mainline.

2.4.2 Work to assess the impact of the forecast traffic growth has been undertaken using the Tyne and Wear Meso model, and subsequently the extended version, the North East Strategic Mesoscopic Model (NESMM). Tests have been run for the Base Year, 2015 and 2020. The results are shown in Table 2-4. The metric reported is delay, which is the difference between the Actual Link Travel Time and Free Flow Link Travel Time.

2.4.3 This set of tests shows that without intervention, conditions on the A1 NGWB will deteriorate, particularly in the current pinch point areas of Birtley in the A1 peak period. To the north of the river, conditions in the section between Scotswood and Ponteland Road are also forecast to deteriorate.

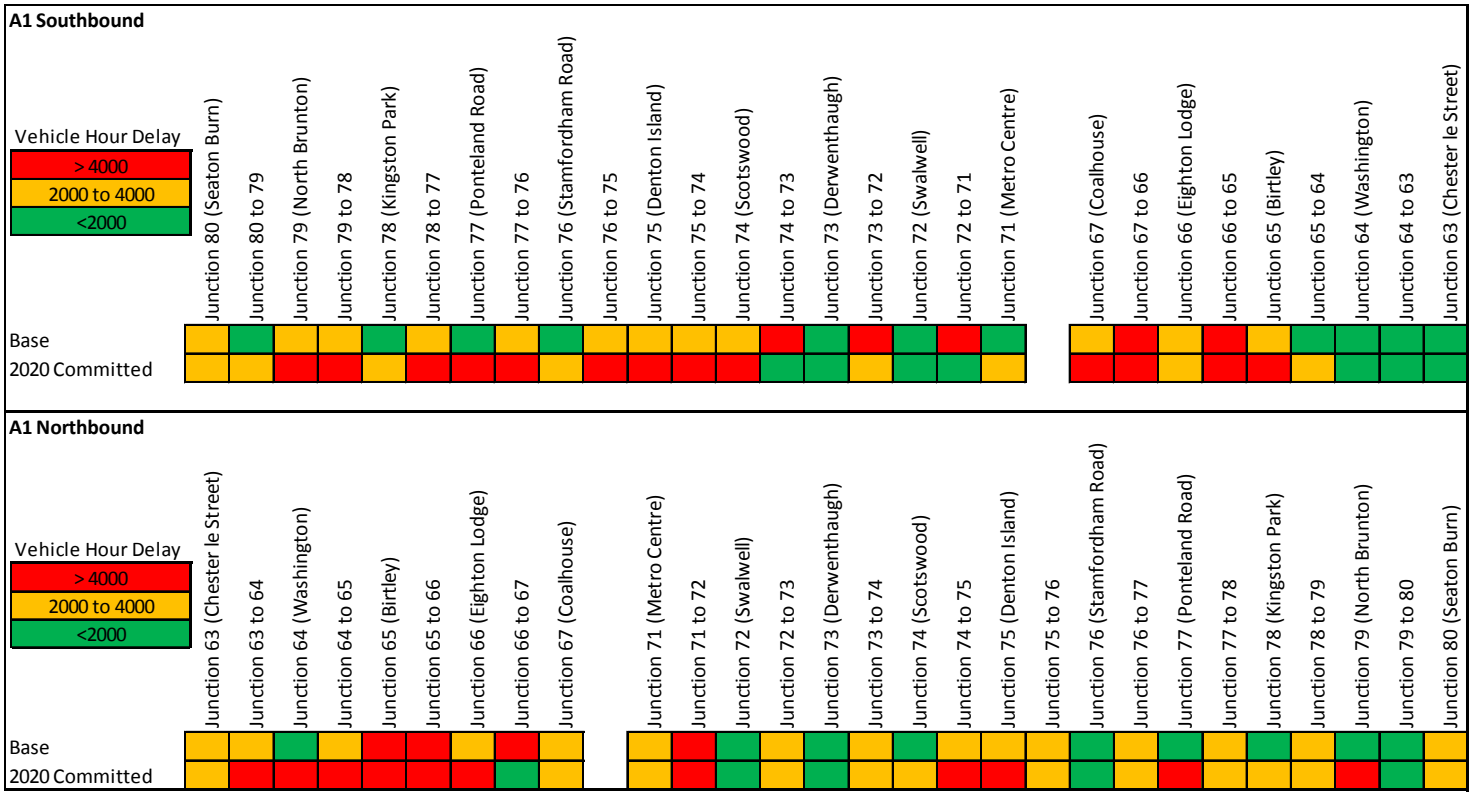


Table 2-4: Meso Model Delay Results from 2014 A1 NGWB Infrastructure study

2.4.4 The key future issues forecast on the route are discussed in Table 2-5.

Section	Link	2020 Forecast Performance
1	J65 Birtley – J66 Eighton Lodge	• Increased delays • Increased flows likely to worsen high accident rates
	J66 Eighton Lodge – J67 Coalhouse	• Northbound delays may decrease due to Coalhouse to Metrocentre scheme • Increased delays in southbound direction • Increased flows likely to worsen high accident rates
2	J71 Metrocentre – Derwent Bridge	• Southbound delays likely to decrease due to Coalhouse to Metrocentre scheme • Delays in northbound direction likely to increase • Relatively high accident rates likely to be mitigated by Coalhouse to Metrocentre scheme (in southbound direction) • Poor air quality will remain
	Derwent Bridge – J73 Derwenthaugh	• Southbound delays likely to decrease due to Coalhouse to Metrocentre scheme • Relatively high accident rates likely to be mitigated by Coalhouse to Metrocentre scheme (in southbound direction) • Air quality likely to improve due to Coalhouse to Metrocentre scheme • Northbound delay forecast to worsen
3	J73 Derwenthaugh – J74 Scotswood	
4	J74 Scotswood – J75 Denton Island	• Delays forecast to increase in both directions • High number of collisions likely to worsen due to increased traffic flows • Poor air quality likely to worsen due to increased traffic flows
5	J75 Denton Island – J76 Stamfordham Road	• Delays forecast to increase in both directions • High number of KSIs likely to worsen due to increased traffic flows • Poor reliability likely to worsen due to increased traffic flows • Poor air quality likely to worsen due to increased traffic flows
	J76 Stamfordham Road – J77 Ponteland Road	• Callerton Park & Airport development traffic leads to significant flow increases • Delays forecast to increase in both directions • Accident issues likely to worsen due to increased traffic flows
6	J77 Ponteland Road – J79 North Brunton	• Great Park development traffic leads to significant flow increases • Delays forecast to increase in both directions • Poor air quality likely to worsen due to increased traffic flows
7	J79 North Brunton – J80 Seaton Burn	• Some accident issues may worsen due to increased traffic flows • Southbound delays due to traffic queuing onto A1 from North Brunton junction

Table 2-5: Summary of 2020 forecast section performance

2.4.5 In terms of the forecast impacts on the junctions Table 2-6 provides an overview of the 2020 committed situation predicted by the NESMM model.

Junction	2020 Forecast Performance
J62: Carrville	• Residential development in Durham increases flows • Improvement scheme consisting of widening works on approaches has been developed by MAC
J63: Chester-le-Street	• Increased development in Chester-le-Street increases queuing
J64: Washington	• Queuing back from mainline through Birtley impacts on NB merge and Washington Highway
J65: Birtley	• Queuing increases due to traffic growth
J66: Eighton Lodge	• Durham Road queuing increases significantly
J67: Coalhouse	• Queuing on Lamesley Lane increases • Queuing on Kingsway increases significantly due to development in Team Valley
J68: Lobley Hill	• Maingate roundabout queues extend through junction causing significant issues to roundabout capacity and operation
J69: Askew Road	• Coalhouse to Metrocentre scheme alleviates mainline issues impacting on this junction • Potential for Maingate roundabout queues to impact operation of Askew Road
J70: Dunston	• Junction predicted to be over capacity due to development traffic from Metro Green site
J71: Metrocentre	• Junction predicted to be over capacity due to development traffic from Metro Green site
J72: Swallwell	• No notable issues
J73: Derwenthaugh	• No notable issues
J74: Scotswood	• Queuing back from A695 onto SB off slip extends onto mainline in AM peak without change to this roundabout (subject to LA scheme) • NB mainline queuing impacts on NB on-slip
J75: Denton Burn	• Callerton development traffic increases queues on A69 and A186 arms in peaks • Signalisation scheme recently completed may alleviate issues
J76: Stamfordham	• Some queuing observed on Stamfordham Road approaches and slip roads in peaks
J77: Ponteland Road	• Severe queuing on approach arms due to Callerton and Airport developments
J78: Kingston Park	• Some queuing develops on approaches in peaks
J79: North Brunton	• Queuing from A1056 impacts junction more significantly in PM peak including slip roads • Queues on other arms increase due to Great Park development traffic
J80: Seaton Burn	• Pinch point scheme alleviates issues but Cramlington development traffic negates benefits

Table 2-6: Forecast 2020 Junction Impacts

2.5 Need for Intervention & Study-specific objectives

2.5.1 The summary of issues on the A1 NGWB and discussion in the Stage 1 report establish a clear need for intervention on the route. A list of intervention-specific objectives to address the identified problems has been drawn up. These objectives reflect the study and policy objectives and are shown in Table 2-7 along with the evidence for the objective.

2.5.2 Supporting all these objectives are the operational objectives related to the performance of the A1 NGWB itself, informed by the current performance of the corridor. This issue is seen, in particular, by stakeholders as being a major constraint on economic development in the area. More specifically, the current operational issues associated with the A1 NGWB are currently seen as an impediment to development proposals that would bring jobs to the area, and provide additional housing stock: a situation that is likely to deteriorate with predicted traffic growth, itself generated by the proposed developments.

Objective	Description	Evidence / Source
A: Economic Growth & Development	Facilitate & support economic growth & housing at key centres and locations served by the A1 NGWB corridor.	In line with national policies / SEP / Stakeholder feedback
B: Movement of Goods & Access to Transport Hubs	Maintain & enhance the role of the corridor in facilitating the movement of goods and access to transport hubs, in particular ports & airports.	In line with national policies / SEP
C: Accessibility	Maintain & improve accessibility to jobs, housing & key services, with due regard to the needs of people living in disadvantaged areas and non-car users.	In line with Highways Agency Public Sector Equality objectives.
D: Journey Times	Reduce delays and journey time unreliability which occur in the corridor.	Based on review of vehicle delay statistics
E: Safety	Improve the safety of the A1 NGWB corridor for road users, including pedestrians and cyclists.	Based on review of road safety statistics
F: Resilience	Improve the resilience of the route, reducing the impacts of collisions and other perturbations for road users.	Based on review of reliability and incident statistics
G: Environment	Avoid, mitigate and compensate for potential impacts upon the built and natural environment.	In line with national & EU standards/objectives. Based on review of available measured and predicted air quality data.
H: Deliverability	Be substantially delivered by 2021 and represent value for money.	DfT requirement

Table 2-7: Intervention Specific Objectives

2.6 Prioritisation of Interventions

2.6.1 The current and future issues identified in the Stage 1 report and summarised here, and the intervention specific objectives are combined in order to provide a means of prioritising the sections for intervention.

2.6.2 How well each of the sections are currently operating in the areas defined by intervention specific objectives D to G has been converted to a 3-point scale (1 = Minor Issue, 2 = Moderate Issue & 3 = Major Issue) based on the evidence presented in Appendix A of the

Stage 1 report. A similar process has been undertaken for 2020.

2.6.3 As objectives A to C relate more to the geographic location and use of the sections one score has been assigned to each section for these objectives rather than scoring them in both the base and future years.

2.6.4 Table 2-8 presents the results of this prioritisation exercise with the individual category scores summed for each intervention to produce an overall score. The higher scoring sections are therefore those with the more significant issues and hence the sections for which interventions should be prioritised.

Section	Description	Current				2020 Committed				Other Characteristics			Score	Rank
		Journey Times	Safety	Resilience	Environment	Journey Times	Safety	Resilience	Environment	Proximity to Development Sites	Access to Transport Hubs & Freight	Accessibility		
1	Birtley (J65) to Coalhouse (J67)	3	3	3	2	3	3	3	2	2	1	3	28	1
2	Metrocentre (J71) to Derwenthaugh (J73)	3	3	3	2	2	2	2	2	3	2	2	26	2
5	Denton (J75) - Ponteland Rd (J77)	2	2	2	2	3	2	2	2	3	3	2	25	=3
6	Ponteland Rd (J77) - North Brunton (J79)	2	2	2	2	3	2	2	2	3	3	2	25	=3
4	Scotswood (J74) - Denton (J75)	2	2	2	2	3	2	2	2	3	2	2	24	4
3	Derwenthaugh (J73) to Scotswood (J74)	3	1	1	2	2	1	1	1	2	2	2	18	5
7	North Brunton (J79) to Seaton Burn (J80)	1	1	1	1	1	1	1	1	2	2	1	13	6

Table 2-8: Prioritisation of Sections for Intervention

2.6.5 The conclusions of the prioritisation process are contained in Table 2-9.

Section	Conclusions
1: Birtley (J65) to Coalhouse (J67)	Highest priority section, acts as the key pinch point in the network to the south of the Metrocentre – Coalhouse scheme.
2: Metrocentre (J71) to Derwenthaugh (J73)	High priority section though some issues relieved by the Metrocentre – Coalhouse scheme
5: Denton (J75) - Ponteland Rd (J77)	These sections score similarly highly with worsening traffic conditions predicted due to the proximity of development sites. Due to close relationship between these sections they are to be treated as one.
6: Ponteland Rd (J77) - North Brunton (J79)	
4: Scotswood (J74) - Denton (J75)	
3: Derwenthaugh (J73) to Scotswood (J74)	Lower priority section, improvements to surrounding sections likely to lead to improvements here.
7: North Brunton (J79) to Seaton Burn (J80)	Lowest priority section. No significant current issues.

Table 2-9: Prioritisation Conclusions

3 Generation of Options

3.1 Introduction

3.1.1 This section summarises the process undertaken to generate options to address the problems identified in the Stage 1 Report, and reported in Chapter 2. The problems are summarised in Table 3-1 below:

Problem No.	Description
1	Current traffic congestion - increased journey times/low traffic speeds on the section
2	Future traffic congestion - will be increased journey times/low traffic speeds on the section
3	Poor/low capacity junction standard/layout
4	Difficult merge/diverge between junctions leads to traffic congestion/accidents
5	Safety - relatively high accidents/incidents for vehicle occupants
6	Safety - relatively high accidents/incidents for NMUs
7	Lack of information for drivers
8	Poor carriageway quality
9	Traffic noise/poor air quality

Table 3-1: Summary of Identified Problems

3.1.2 In order to tackle these problems, numerous interventions / options were developed based on previous work carried out on potential proposals, liaison with stakeholders and engineering judgements.

3.2 Summary of previous studies / evidence reviewed

(i) A1 Newcastle and Gateshead Western Bypass Exploration of Dual 3-Lane Provisions Initial Infrastructure Report (November 2013):

3.2.1 The report was developed on behalf of the Highways Agency Network Delivery and Development (NDD) Directorate. The report explores the potential to increase the A1 mainline capacity to Dual 3-Lane All-Purpose provision from Junction 65 (Birtley Bifurcation) to Junction 80 (Seaton Burn), within the existing highway boundary and with the constraints imposed by the existing major structures.

3.2.2 The key information utilised from the report to inform the option generation process includes:

- Existing width restrictions;
- An initial assessment of the level of provision identified in response to pre-existing (2020) demand flow data for the corridor based on the Highways Agency's Tyne & Wear and Durham mesoscopic model;
- The level of provision that can be provided in light of the existing constraints; and
- Initial illustrative layouts for corridor improvements.

(ii) A1(M) Junction 62 Carville to A1/A19 Seaton Burn Route Based Strategy (March 2013):

3.2.3 The route-based strategy was produced by the Highways Agency in response to the 2011 report 'A Fresh Start for the Strategic Road Network' by Alan Cook (the Non-executive Chairman of the Highways Agency). The purpose of the route-based strategy is to inform the investment strategy for the network on a route by route basis, including operation, maintenance and any enhancements. In addition to other information the report highlights various problems and improvement recommendations on the network.

3.2.4 The key information utilised from the Strategy Report to inform the option generation process includes:

- Recommendations to upgrade existing technology within the network to help with incident management and inform drivers of incidents;
- Recommendations to consider provision of lay-bys, emergency road telephones, observation points and marker posts to help with incident management; and
- Recommendations to improve asset condition (pavement and earthworks) where possible.

(iii) A1 Allerdene Improvement Preliminary Appraisal of Construction Cost (March 2014):

3.2.5 This preliminary study outlined the potential construction cost and programme for the improvement of the A1 between Junction 66 (Eighton Lodge) and Junction 67 (Coalhouse). The proposal included in the study is for the offline dualling to Dual 3 Lane All Purpose Carriageway involving the construction of a major new structure over the East Coast Mainline to replace the existing Allerdene Railway Bridge. Safety, construction, maintenance and economic issues related to online improvements were also considered in the study.

3.2.6 The key information utilised from the study to inform the option generation process are the issues related to online improvements and the benefits of offline dualling within this section.

3.3 Process of option generation and link to identified problems

3.3.1 Prior to developing the interventions, all the committed and aspirational future highways and public transport schemes in the study area on both the SRN and LRN were reviewed to ensure the interventions identified are tailored to complement the schemes where possible. The schemes are detailed in Section 3.5 to 3.7.

3.3.2 It is anticipated that the committed highway schemes on the SRN, which include Coalhouse (J67) to Metrocentre (J71) Improvement and Seaton Burn (J80) Pinch Point schemes will address the problems from J67 to J71 and at J80. The committed LRN scheme to improve access for buses at Maingate Roundabout is also anticipated to have a positive impact at Lobley Hill Roundabout (J68). As a result these sections were omitted from the option generation process, with the exception of J68 and J70 where further improvements were identified.

3.3.3 The aspirational public transport schemes, which include rail and bus corridor improvements are expected to have some impact on demand in the corridor as a result of mode shift. However, the more significant sized schemes which will produce a level of mode shift sufficient to have an impact on the A1 NGWB such as extensions of the Metro system have construction timescales outside of the range of this study.

3.3.4 The route was then divided into 46 sections from J62 to J67, J68, J70 and J71 to J80. The division was in direct correlation with the route division in the Stage 1 Report. The section division was based on the mainline link between junctions, junctions themselves and the mainline through junctions.

3.3.5 Various interventions were then identified for each section based on the evidence highlighted in the Stage 1 Report. The interventions are summarised in Table 3-2 along with the issues and the intervention specific objectives they will address.

Intervention	Problems to Tackle (Refer to Table 3-1)									Intervention Specific Objective (from Table 2-8)						
	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	G
On-line widening	x	x			x					x	x	x	x	x	x	
Narrow lanes or full lanes with discontinuous hardshoulder within existing highway boundary	x	x			x					x	x	x	x	x	x	x
Hardshoulder running	x	x			x					x	x	x	x	x	x	x
Offline dualling	x	x			x			x		x	x	x	x	x	x	
Closure of slip roads	x	x		x	x				x	x	x		x	x	x	x
Junction improvements	x	x	x							x	x	x	x	x	x	
Technology scheme (VMS, MIDAS and CCTV)	x	x			x	x	x			x	x	x	x	x	x	
Reduced speed limit to 50mph with average speed cameras	x	x		x	x					x	x	x	x	x	x	
Provision of lay-bys, emergency road telephones (ERT), observation points and marker posts	x	x			x	x	x			x	x	x	x	x	x	
Pavement and Earthworks strengthening					x			x						x	x	x

No.	Description
1	Current traffic congestion
2	Future traffic congestion
3	Poor/low capacity junction standard/layout.
4	Difficult merge/diverge between junctions
5	Safety - vehicle occupants.
6	Safety - NMUs.
7	Lack of information for drivers
8	Poor carriageway quality
9	Traffic noise/poor air quality

Ref.	Objective
A	Economic Growth & Development
B	Movement of Goods & Access to Transport Hubs
C	Accessibility
D	Journey Times
E	Safety
F	Resilience
G	Environment
H	Deliverability

Table 3-2: Summary of Interventions linked to Identified Problems and Specific Objectives

3.3.6 For a more detailed description of all the interventions along with the evidence used to generate the interventions refer to Table 3-3 below.

Intervention	Description	Evidence (Refer to Section 6.2)
On-line widening	Full widening to provide standard lane widths (3.65m minimum lane widths) in accordance with TD27/06 and required number of lanes based on 2029 traffic demand flow.	6.2(i)
Narrow lanes or full lanes with discontinuous hardshoulder within existing highway boundary	Narrow Lanes (3m minimum lane width) with minimal widening to accommodate the number of lanes that can be provided within existing highway boundary and major physical constraints.	6.2(i)
Offline dualling	New dual carriageway (including new bridges where necessary) constructed parallel to existing carriageway.	6.2(iii)
Closure of slip roads	Permanently close slip roads	6.2(i)
Junction improvements	Junction signalisation and widening	Engineering judgement and stakeholder recommendations
Technology scheme (MIDAS, CCTV and VMS)	Upgrade communications infrastructure with fibre optic cable, Motorway Incident Detection and Automated Signalling (MIDAS), Variable Message Signs (VMS), and CCTV at strategic locations.	6.2(ii)
Reduced speed limit to 50mph with average speed cameras	Reduced speed limit from 70mph to 50mph and provide average speed cameras to enable safe provision of narrow lanes.	6.2(i)
Provision of lay-bys, emergency road telephones (ERT), observation points and marker posts	Provision of lay-bys, emergency road telephones (ERT), observation points and marker posts at strategic locations.	6.2(ii)
Pavement and Earthworks strengthening	Reconstruction of existing pavement and stabilisation of existing earthworks strengthening.	6.2(ii)

Table 3-3: Description of Interventions linked to evidence

3.3.7 A total of 128 interventions with 15 packages of interventions options were put forward to the Pre-EAST sifting process. The 15 packages of options were generated in order to provide larger intervention options. They were generated by merging some of the sections and assigning multiple interventions to them. These are detailed in Appendix A.

4 Initial Sifting

4.1 Introduction

4.1.1 This chapter summarises the approach applied to sift the list of options and identify the better performing ones to take forward to the more detailed assessment described in the next chapter of this report. An initial 'pre-sift' was undertaken with the options making it through this process being put through the Early Assessment & Sifting Tool (EAST) spreadsheet based process. A summary of this process is included in Figure 4-1.

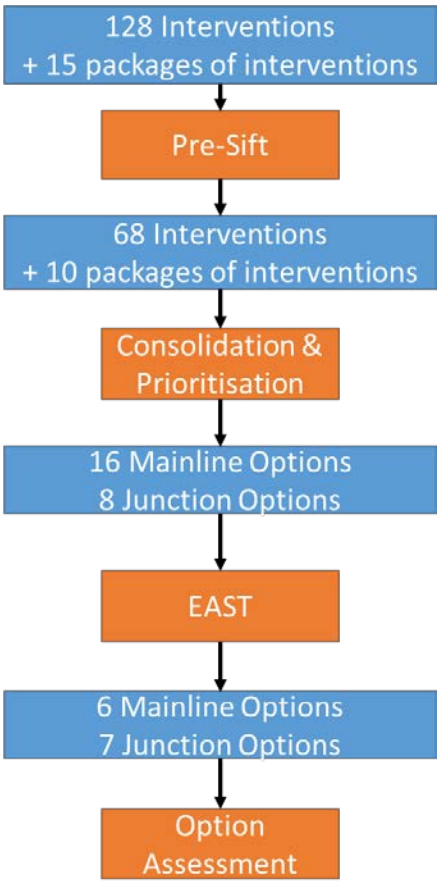


Figure 4-1: Sifting Process

4.2 Pre-EAST Sift

4.2.1 The Pre-EAST spreadsheet based sifting tool facilitates a quick high level appraisal of interventions against the identified problems and objectives determined by the evidence reported in the Stage 1 Report prior to the EAST Appraisal.

4.2.2 In general the pre-sift tool helps to identify and discard the interventions that fail to address the identified problems or support the route objectives. The pre-sift tool also discards interventions which are not considered to be deliverable or are unfeasible.

Qualitative assessment against identified problems	
2	Large beneficial impact
1	Beneficial impact
0	Neutral / marginal impact
-1	Adverse impact
-2	Large adverse impact

Qualitative assessment against identified objectives	
2	Large beneficial impact
1	Beneficial impact
0	Neutral / marginal impact
-1	Adverse impact
-2	Large adverse impact

Reference (Route Section-Intervention)	Option Description	Problems (EAST Scale of Impact)									Objectives (EAST Fit with Other Objectives)								
		1	2	3	4	5	6	7	x	Total	1	2	3	4	5	6	7	x	Total
1-A	xxxxxx	2	0	2	0	0	0	2	0	6	0	1	2	0	0	0	1	0	4
1-B	xxxxxx	2	2	2	2	2	2	2	2	16	2	2	2	-1	1	0	2	-1	7
1-C	xxxxxx	2	2	2	2	2	2	2	2	16	2	2	2	2	1	0	-1	-2	6
1-X	xxxxxx	0	-1	1	-1	1	-2	0	1	-1	1	1	1	2	1	0	-1	0	5
2-A	xxxxxx	1	-1	1	1	1	0	0	1	4	1	1	1	2	1	0	1	0	7

Figure 4-2: Extract from Pre-Sift Tool

4.2.3 The pre-sift tool adopts a simple scoring system based on a qualitative assessment of each intervention against the Problems and Objectives as follows:

- 2 – Intervention has a large beneficial impact on a problem/objective
- 1 – Intervention has a beneficial impact on a problem/objective
- 0 – Intervention has a neutral impact on a problem/objective
- -1 – Intervention has an adverse impact on a problem/objective
- -2 – Intervention has a large adverse impact on a problem/objective

4.2.4 Each intervention is also scored on its deliverability as follows:

- Deliverable in theory
- Deliverable but with challenges
- Very difficult to deliver

4.2.5 Finally each intervention was scored against feasibility as follows:

- Feasible in theory
- Feasible but with challenges
- Not feasible / significant challenges

4.2.6 The initial sift criteria for an intervention to progress to EAST is as follows:

- Intervention should have a moderate impact on identified problems (appraisal score >4)
- Intervention should have a moderate fit with route objectives (appraisal score >3)
- Must not be very difficult to deliver
- Must not be unfeasible / have significant challenges

4.2.7 If the intervention fails on one or more of the criteria listed above, the intervention is discarded from the process.

4.2.8 The rationale for the scoring system is as follows. The score against the problems had to be greater than 4 thereby delivering the equivalent of a large beneficial impact on over 2 identified problems. A score greater than 3 against objectives ensured that the intervention delivered a large beneficial impact on 2 identified objectives. An intervention option is considered not feasible/significant challenges where there are significant physical constraints. The intervention options that are considered to be very difficult to deliver have significant political, planning, timescale or third party issues.

4.2.9 All 128 interventions and 15 packages of interventions were assessed using the pre-sift tool against the identified problems detailed in Table 3-1 and route objectives detailed in Table 2-7 above.

4.2.10 A total of 68 interventions and 10 packages of interventions were put forward from the pre-sift and a total of 60 interventions and 5 packages of interventions were discarded in accordance with the criteria above. Refer to Appendix A for results of the pre-EAST sifting along with the reasons why each individual option was discarded.

4.3 Further Sifting and Option Development

4.3.1 As a result of the completion of the Pre-EAST sifting and prioritisation exercise, the following conclusions were reached prior to commencing the EAST Appraisal:

- Omit the interventions on the mainline between J62 and J65 on the mainline carriageway as this section is already at motorway standard and any issues on this section can be attributed to the issues at the Junction 65 merge.
- Omit the interventions related to the improvement of asset condition alone, as these interventions would not have a significant impact on the wider problems and issues on the route. Asset condition will be addressed within the proposals that address the wider issues and problems on the route.
- Package the initial sections together into larger interventions and rank each section in priority order as shown in Table 2-9 in order to provide a robust and easily presentable means of identifying the options to be put forward through the EAST Appraisal.

4.3.2 As a result of the above consolidation, a total of 16 mainline options (packaged interventions) as listed in Table 4-1 were agreed to put forward into EAST. Furthermore 8 junction based interventions were also taken forward into EAST, the details of these are presented in Table 4-2.

Option	Description
1A	• Full three lane widening (D3AP) between J65-J67 • Lane gain/drop between junctions • Includes widening existing Allerdene Bridge
1B	• Full three lane widening between J65-J67 • Lane gain/drop between junctions • New offline Allerdene Bridge • New dumb-bell junction for Coalhouse
1AC	• Full three lane widening between J65-J67 apart from through J66 where 3 narrow lanes will be provided • Lane gain/drop between junctions • Includes widening existing Allerdene Bridge
2A	• Close J72, • Full three lane widening (D3AP) J71-J73 • Lane gain at J73
2C	• Close J72 • 3 narrow lanes J71-J72 • 3 narrow lanes NB + 2 narrow lanes SB J72-J73
3A	• Full three lane widening (D3AP) J73-J74 • Widen existing Blaydon bridge
3B	• Full three lane widening (D3AP) J73-J74 • New Blaydon bridge
4A	• Full three lane widening (D3AP) J74-J75 • Lane gain/drop between junctions
4C	• Provision of 3 narrow lanes J74-J75 • Lane gain / lane drop between junctions
5A	• Full three lane widening (D3AP) southbound J77-J75 • Full three lane widening (D3AP) northbound J76-J77 • Full four lane widening (D4AP) northbound J75-76 • Lane gain/drop between junctions
5C	• 3 narrow lanes J75-J77 • Lane gain/drop between junctions
6A	• Full three lane widening (D3AP) J77-J79 • Lane gain/drop between junctions
6C	• 3 narrow lanes J77-J78 • Full three lane widening (D3AP) J78-J79
7A	• Full three lane widening (D3AP) J79-J80
1-7 Technology	• Midas • VMS • CCTV system
1-7 Bypass	• New Bypass to west J65-J80

Table 4-1: Mainline Options Assessed in EAST

Option	Description
J62: Carrville	• Widening of northbound diverge slip to three lanes
J64: Washington	• Widening of northbound on-slip to two lanes
J65: Birtley	• Extend existing three lanes at approach to A1231 Lookout Lake roundabout • Includes three lane flare on southbound diverge slip
J66: Eighton Lodge	• Full signalisation of junction. • Extend existing two lanes on southbound merge slip • Widen northbound diverge slip to three lanes at approach to roundabout • Extend existing three lanes on southbound diverge slip at approach to roundabout
J68: Lobley Hill	• Widen northbound off slip to three lanes • Include three lanes on circulatory to accommodate three lanes on off slip
J71: Metrocentre	• Widening of southbound diverge slip to three lanes at approach to Hollinside Road
J72: Swallwell	• Closure of Swallwell slip roads
J79: North Brunton	• Widening of northbound & southbound diverge slip roads to three lanes at approach to junction

Table 4-2: Junction Options Assessed in EAST

4.3.3 It should be noted that interventions at the following junctions were excluded from further assessment as there are already existing improvement schemes under consideration in these locations:

- Chester-le-Street (J63): Pinch Point Scheme to widen roundabout circulatory and approach arms;
- Coalhouse (J67): partial signalisation and widening of approach arms;
- Scotswood (J74): Scotswood Bridgehead north junction realignment and signalisation;
- Denton Burn (J75): signalisation scheme; and
- Seaton Burn (J80): Pinch Point Scheme providing additional capacity at Fisher Lane roundabout and improvements to A1 slip road.

4.4 EAST Process

4.4.1 EAST is a DfT decision support tool designed to summarise and present evidence on schemes to enable a high level comparison between schemes to be undertaken. It follows a similar structure to later elements of the transport business case process to ensure consistency of appraisal.

4.4.2 EAST is spreadsheet based and covers both qualitative scoring of the schemes against a series of different criteria and a requirement to justify the scores that have been assigned. The key criteria are as follows:

- **Strategic Fit** (fit with objectives, likely scale of impact, agreement with stakeholders)
- **Economic** (economic growth, environment, distributional impacts, society, VfM)

- **Managerial** (timetable, feasibility, public acceptability)
- **Financial** (costs)
- **Commercial** (delivery, flexibility)

4.4.3 The EAST assessment enables the best options to be identified by comparing the relative scores between options in the above areas. This sifts out the poorer performing options and enables the better performing options to be focussed on in subsequent stages.

4.4.4 The 16 interventions that came out of the pre-sift process were put through the EAST process. Evidence collected through Stage 1 of this study and experience of the impacts of similar schemes elsewhere were used to inform the EAST scoring.

4.5 EAST Results

4.5.1 The results of the scoring exercise for each of the mainline interventions are presented in Table 4-4 with the junction intervention results summarised in Table 4-5. It should be noted that EAST doesn't provide a means for obtaining an overall score for an intervention and therefore doesn't provide a means of directly ranking the interventions. Rather, it enables the relative impacts of the interventions to be compared to inform a judgement on which interventions are the better performing ones.

4.5.2 The key assumptions used to inform the scoring of schemes in certain assessment areas are shown in Table 4-3 below.

Area	Assumptions
Timescales	Minor Junction Improvement: 6-12 months More complex Junction Improvement:1-2 years Provision of Narrow Lanes: 2-5 years Widening to D3AP: 5-10 years More complex schemes: 10+ years
Costs	Junction Improvement: £0-£5m Junction Improvement including bridge works: £5-£10m Narrow Lanes: £25m-£50m Short section D3AP with no significant structures works: £50m-£100m Schemes involving new bridges: £100m-£250m Schemes involving lots of additional land take >£250m
Economic Impacts	Scores to account for both the seriousness of the issues at the location + the extent of the scheme

Table 4-3: EAST Assumptions

Option	Strategic				Economic						Managerial				Financial			Commercial
	Scale of Impact	Fit with wider objectives	Fit with other objectives	Consensus over outcome	Economic Growth	Carbon Emissions	SDI & the Regions	Local Environment	Well being	Expected VfM Category	Implementation Timetable	Public Acceptability	Practical Feasibility	Quality of Evidence	Capital costs (£m)	Revenue Costs (£m)	Cost Risk	Flexibility of Option
1A: D3AP J65-J67 plus lane gain/drop between Jns	4	3	5	3	5	3	4	3	5	2	6	4	1	3	8	3	2	3
1B: As 1A but new Allerdene Bridge	4	3	5	3	5	2	4	2	5	3	6	3	2	3	8	2	2	3
1AC: As 1A but narrow lanes at J66	4	3	5	3	5	3	4	3	5	2	6	4	1	3	8	3	2	3
2A: Close Jn72, D3AP J71-J73 + lane gain/drop between Jns	4	3	5	3	4	3	4	3	4	3	6	3	2	3	6	3	2	3
2C: Close Jn72, 3 narrow lanes J71-J72, 3 narrow lanes NB + 2 narrow lanes SB J72-J73	4	4	5	3	4	3	4	3	4	2	5	3	3	3	5	3	3	3
3A: D3AP J73-J74	3	3	5	3	3	3	3	3	4	3	6	4	2	3	8	4	2	3
3B: D3AP J73-J74 + new Blaydon bridge	3	3	5	3	3	3	3	3	4	4	7	4	1	3	9	2	1	3
4A: D3AP J74-J75 plus lane gain/drop between Jns	3	3	5	3	4	3	4	3	4	5	7	2	2	3	8	4	1	3
4C: Provision of 3 narrow lanes J74-J75 plus lane gain / lane drop between Jns	3	3	5	3	4	3	4	3	4	3	5	4	4	3	5	3	3	3
5A: D3AP southbound J77-J75, D3AP northbound J76-J77, D4AP northbound J75-76, lane gain/drop between Jns	5	3	5	3	4	3	4	3	4	3	6	4	3	3	6	3	2	3
5C: 3 narrow lanes J75-J77, lane gain/drop between Jns	4	3	5	3	4	3	4	3	4	2	5	4	4	3	5	3	3	3
6A: D3AP J77-J79 plus lane gain/drop between Jns	5	3	5	3	4	3	4	3	4	3	6	4	3	3	6	3	2	3
6C: 3 narrow lanes J77-J78, as 6A J78-J79	4	4	5	3	4	3	4	3	4	2	6	4	4	3	5	3	3	3
7A: D3AP J79-J80	1	1	2	3	3	3	3	3	3	4	5	4	4	3	5	3	3	3
1to7 Fibre Optics: Midas, VMS, CCTV system	3	4	5	3	3	3	3	3	3	3	5	4	3	3	6	1	1	2
1to7 Bypass: New Bypass to west J65-J80	2	2	2	3	2	2	2	2	2	5	7	2	1	3	10	2	1	2

Categorisation																			
	1: Low									1. V High >4	5. 2-5 yrs	1: Low				5. 25-50	1. None	1: High Risk	1: Static
	2									2. High 2-4	6. 5-10 yrs	2				6. 50-100	2. 0-5	2	2
	3									3. Med 1.5-2	7. 10+ yrs	3				7. 100-250	3. 5-10	3	3
	4									4. Low 1-1.5		4				8. 250-500	4. 10-25	4	4
	5: High									5. Poor <1		5: High				9. 500-1000	5. 25-50	5: Low Risk	5: Dynamic
																10. 1000+			

Table 4-4: Mainline Intervention EAST Scores

Option	Strategic				Economic						Managerial				Financial			Commercial
	Scale of Impact	Fit with wider objectives	Fit with other objectives	Consensus over outcome	Economic Growth	Carbon Emissions	SDI & the Regions	Local Environment	Well being	Expected VfM Category	Implementation Timetable	Public Acceptability	Practical Feasibility	Quality of Evidence	Capital costs (£m)	Revenue Costs (£m)	Cost Risk	Flexibility of Option
J62: Widening of NB diverge slip to 3 lanes	2	3	4	3	3	3	3	3	3	3	3	4	4	3	2	2	4	4
J64: Widening NB on slip to 2 lanes	2	3	4	3	2	3	3	3	3	5	4	4	3	3	3	2	3	4
J65: Extend existing 3 lanes at approach to stop/give way line on the southbound diverge slip onto A1231.	4	2	5	3	3	3	3	3	3	3	3	4	4	3	2	2	4	3
J66: Full signalisation of junction. Extend existing 2 lanes on southbound merge slip. Widen A1 northbound diverge slip to 3 lanes at approach to stop/give way line and extend existing 3 lanes on southbound approach to stop/give way line.	4	3	5	3	3	3	3	3	3	2	4	4	4	3	2	2	4	3
J68: Widening NB off slip to 3 lanes and include 3 lanes on certain points of circulatory	3	3	4	3	3	3	3	3	3	3	3	4	4	3	2	2	4	4
J71: Widening of diverge slips to 3 lanes at southbound approach to Hollinside Road stop/give way line	3	4	5	3	3	3	3	3	3	3	3	4	4	3	2	2	4	3
J72: Closure of Swallwell slip roads	5	3	5	3	4	3	4	3	4	2	3	3	4	3	2	1	4	2
J79: Widening of A1 northbound diverge slip road to 3 lanes at approach to stop line on nearside and offside. Extend A1 southbound diverge slip roads to 3 lanes at approach to stop line.	2	3	4	3	3	3	3	3	3	3	3	4	4	3	2	2	4	4

Categorisation																		
	1: Low									1. V High >4	3. 6-12 mo	1: Low			2. 0-5	1. None	1: High Risk	1: Static
	2									2. High 2-4	4. 1-2 yrs	2			3. 5-10	2. 0-5	2	2
	3									3. Med 1.5-2		3				3. 5-10	3	3
	4									4. Low 1-1.5		4				4. 10-25	4	4
	5: High									5. Poor <1		5: High				5. 25-50	5: Low Risk	5: Dynamic

Table 4-5: Junction Intervention EAST Scores

4.5.3 Combining the results of the EAST process with those from the section prioritisation exercise provided a series of conclusions to inform which sections and interventions would be considered in the more detailed option assessment stage. These conclusions are summarised in Table 4-6.

Section	Priority Level	Intervention(s) for Further Assessment	Key Reasons
1	High	Option 1B: Online widening to Dual 3 Lane All Purpose between J65 and J67 plus new offline structure to replace Allerdene Railway Bridge Junction 65: Extend existing 3 lanes at approach to stop/give way line on the southbound diverge slip onto A1231. Junction 66: Full signalisation of junction. Extend existing 2 lanes on southbound merge slip. Widen A1 northbound diverge slip to 3 lanes at approach to stop/give way line and extend existing 3 lanes on southbound approach to stop/give way line.	Based on investigations by HA Network Delivery & Development (NDD) the alternative options of widening the existing bridge are not practical and so options 1A & 1AC scored low in EAST. Allerdene bridge represents a key pinch point of the route and the whole of section 1 has been identified as a congestion hot spot. Queues back onto A1231 from northbound slip onto A1 at junction 65 should be resolved by mainline option. Implementing junction 65 intervention will mitigate potential for queues from A1231 blocking back onto A1 southbound mainline. Improvements to junction 66 should mitigate potential for queues from this roundabout affecting the A1 mainline in either direction. Furthermore, the intervention should improve conditions on the other junction arms.
2	High	Option 2A: Closure of J72 and online Dual 3 Lane All Purpose widening Option 2C: Closure of J72 and 3 narrow lanes with 50mph speed limit Junction 71: Widening of diverge slips to 3 lanes at southbound approach to Hollinside Road stop/give way line Junction 72: Closure of Swallwell slip roads (in absence of Option 2A or 2C)	There is insufficient evidence without further assessment work to decide which of the two mainline options will represent best value for money so both are to be assessed further. In other categories the two options score similarly in EAST. Improvements to junction 71 should mitigate potential for queues from this junction affecting the A1 mainline in the southbound direction. Should neither Option 2A or 2C represent sufficient value for money then some benefit may result from closure of J72.
4, 5 & 6	High	Option 4,5,6A: Online Dual 3 All Purpose widening Option 4,5,6C: Narrow lanes widening with reduced speed limit Junction 79: Widening of A1 northbound diverge slip road to 3 lanes at approach to	There is insufficient evidence without further assessment work to decide which of these mainline options will represent best value for money so both are to be assessed further. These three sections are to be combined into one for the purposes of scheme assessment given the way the operation of the sections affect each

		stop line on nearside and offside. Extend A1 southbound diverge slip roads to 3 lanes at approach to stop line.	other. Furthermore given the differences in speed limits between the two types of widening a 'mix and match' approach on each of the three sections is not particularly feasible without reduced speed running on the D3AP sections. Improvements to junction 79 should mitigate potential for queues from this roundabout affecting the A1 mainline in either direction.
3	Medium / Low	None	This section is a lower priority and neither of the interventions score particularly well in EAST so neither are to be assessed further unless traffic modelling of Section 2 and/or 4,5,6 interventions highlights additional issues caused here The options score poorly in EAST due to the costs and feasibility issues surrounding works to or replacement of Derwenthaugh bridge. Furthermore, the level of impact generated by the options on this section is likely to be small as current issues are largely caused by surrounding sections.
7	Low	None	This section is low priority and the intervention doesn't score particularly well in EAST so this isn't to be assessed further unless traffic modelling of Section 4,5,6 interventions highlights additional issues caused here This option scores poorly in EAST as there are not significant issues on this section of the route and therefore the option will not generate large benefits.
Whole Route	N/A	Information technology scheme for the whole route. To include Variable Message Signs, CCTV etc.	Bypass scheme scores poorly in EAST as there is very little end to end traffic at the most congested time periods. Information technology scheme is to be assessed further as this provides a means for tackling a number of the highlighted issues such as reliability and safety along the whole route without significant infrastructure works
J62 – J64 junctions	Excluded from mainline improvement assessment	Junction 62: Widening of NB diverge slip to 3 lanes	Improvements to junction 62 should mitigate potential for queues from this roundabout affecting the A1 mainline in the northbound direction. Junction 64 intervention scored poorly in EAST due

			to large costs associated with the works as they require changes to the overbridge here
J67 – J71	Excluded from mainline improvement assessment	Junction 68: Widening NB off slip to 3 lanes and include 3 lanes on certain points of circulatory	Improvements to junction 68 should mitigate potential for queues from this roundabout affecting the A1 mainline in the northbound direction.

Table 4-6: EAST Conclusions

4.5.4 Further details of what is included in each mainline option are contained in Table 4-7.

Option	Junction From	Junction To	Proposed Widening	Additional Provision	Lane Gain / Drop
1B	65 (Birtley)	66 (Eighton Lodge)	Dual 3 Lane All Purpose		Yes
	66 (Eighton Lodge)	67 (Coalhouse)	Dual 3 Lane All Purpose	Offline improvement where the A1 crosses the East Coast Mainline Railway including new structures crossing the railway. New “dumb bell” junction at Junction 67 (Coalhouse)	Yes
2A	71 (Metrocentre)	73 (Derwenthaugh)	Dual 3 Lane All Purpose	Close slip roads at Junction 72 (Swalwell)	Yes (Junction 73 only)
2C	71 (Metrocentre)	73 (Derwenthaugh)	3 narrow lanes northbound. 2 narrow lanes southbound from J73 across Derwenthaugh Bridge. 3 narrow lanes from Derwenthaugh Bridge to J71	Close slip roads at Junction 72 (Swalwell)	Yes (Junction 73 only)
4-6A	74 (Scotswood)	75 (Denton Island)	Dual 3 Lane All Purpose	N/A	Yes
	75 (Denton Island)	76 (Stamfordham Road)	Dual 4 Lane All Purpose Northbound Dual 3 Lane All Purpose		Yes

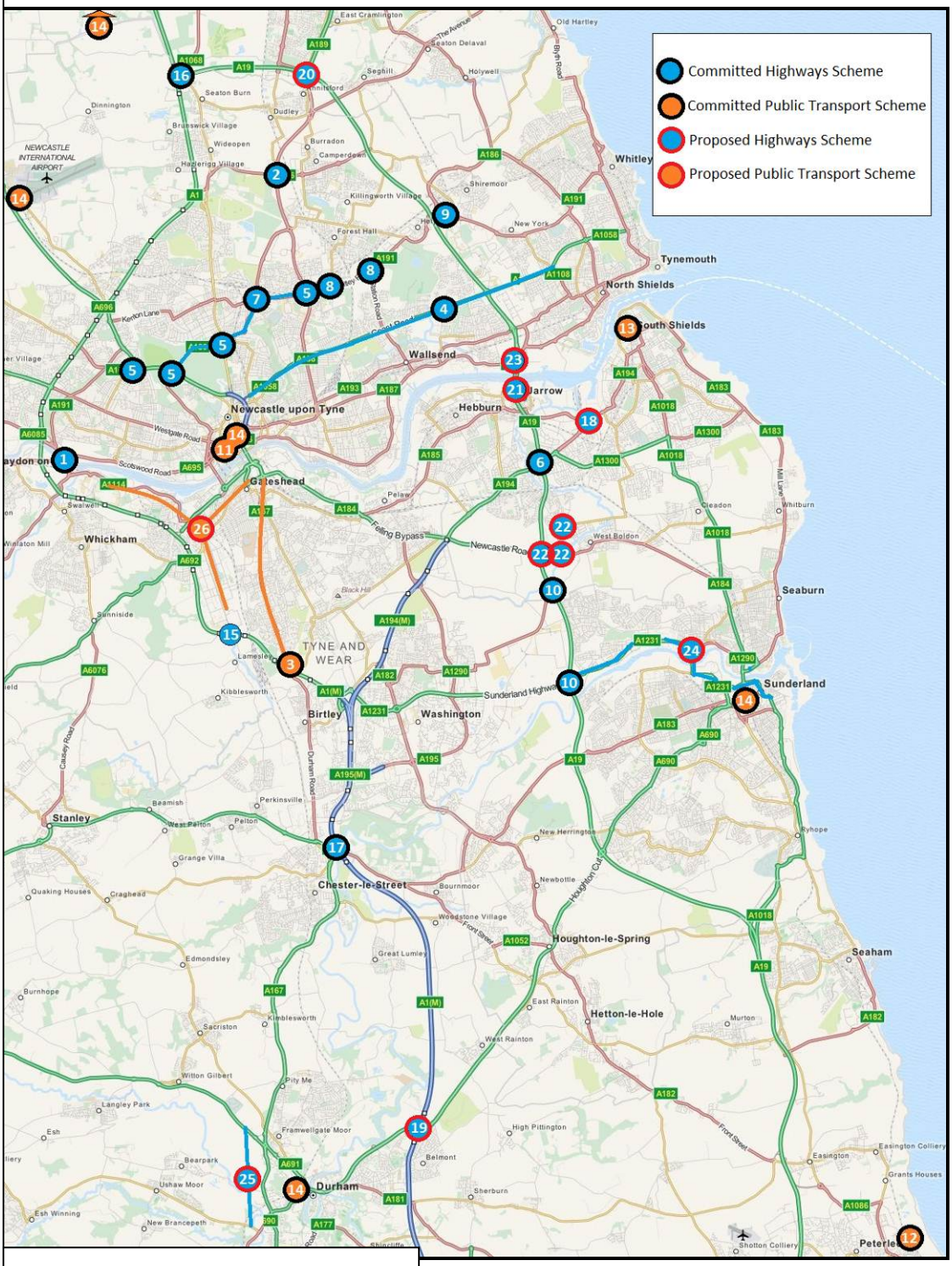
			Southbound		
	76 (Stamfordham Road)	77 (Ponteland Road)	Dual 3 Lane All Purpose		Yes
	77 (Ponteland Road)	78 (Kingston Park)	Dual 3 Lane All Purpose		Yes
	78 (Kingston Park)	79 (North Brunton)	Dual 3 Lane All Purpose		Yes (Junction 79 only)
4-6C	74 (Scotswood)	77 (Ponteland Road)	3 Narrow Lanes	N/A	Yes
	77 (Ponteland Road)	78 (Kingston Park)	3 Narrow Lanes		No
	78 (Kingston Park)	79 (North Brunton)	Dual 3 Lane All Purpose		Yes (Junction 79 only)
Technology	62 (Carville)	80 (Seaton Burn)	N/A	Provision of MIDAS, VMS and CCTV	No

Table 4-7: Option Details

4.6 Synergies with Local Schemes

4.6.1 Through consultation with the local authorities a list of proposed and committed highways and public transport schemes has been compiled. Appendix B contains a technical note provided by Newcastle City Council summarising the key schemes which are plotted in Figure 4-3.

1. Scotswood Bridgehead
2. Weetslade Junction
3. A167 Park and Ride corridor
4. A1058 Strategic Corridor Improvement
5. Newcastle Northern Access Corridor (Phase 1)
6. Lindisfarne Roundabout
7. Northern Access Corridor (Phase 2)
8. Coach Lane and Tyne View Park
9. A19 employment corridor access improvements
10. Sunderland Low Carbon Zone
11. Central Metro Station Refurbishment
12. Horden Rail Station
13. South Shields Transport Hub
14. Gateway Improvements
15. Coalhouse Junction LNMS Scheme
16. Seaton Burn & Fisher Lane Pinch Point
17. J63 Chester-le-Street Pinch Point
18. A194/A185 'The Arches' junction
19. A1/A690 junction improvements
20. A19/A189 Seaham / Murton Interchange
21. Tyne Tunnel southern portal improvements
22. Boldon Business Park Corridor Access
23. Improvements to access from the A19 to the north bank of the Tyne
24. Sunderland Strategic Transport Corridor
25. Durham Western Relief Road
26. Metro Enhancements



Non-geographical specific schemes

A. Urban Traffic Management and Control
B. Cycling Schemes
C. Green Light to Work (Scooters Scheme)
D. Better Bus Areas Fund
E. Local Sustainable Transport Fund

Figure 4-3: Local Schemes

Impact of Local Schemes on A1 NGWB

4.6.2 A high level assessment of the details of these local schemes has been undertaken to gain an understanding their likely impact on the A1 NGWB and how far they address existing and future priority problems on the Western bypass (i.e. meet the feasibility study objectives).

4.6.3 Table 4-8 presents the outcomes of this assessment for the committed schemes and Table 4-9 does the same for proposed schemes.

ID	Scheme	Impact on Objectives (Does the scheme address existing and future priority problems on the Western bypass?)
1	A1 Scotswood Bridgehead	Seeks to reduce congestion at Scotswood bridge so may reduce potential for queuing traffic to back onto A1 mainline at Scotswood southbound slip (though A191 / A695 junction may still cause queues on this slip road). Improves alternative route to/from areas around the Metrocentre avoiding section J71 - J74 of the A1 which may reduce the quantity of traffic, and thereby the problems, on this section of the A1 NGWB.
2	Weetslade Junction	Improvements in this location removing congestion could encourage traffic to use the local road network rather than the A1 NGWB for certain movements thereby improving conditions on the A1 NGWB. However, the impact is likely to be small in this instance.
3	A167 Park and Ride corridor	Provision of a Park & Ride site at Eighton Lodge with associated bus corridor improvements will encourage mode shift from car users to the new P&R services into Newcastle / Gateshead. This is likely to have a small reduction on the number of vehicles on the A1 to the north of Eighton Lodge. However, a negative impact will be additional demand at Eighton Lodge junction which may impact on the operation of the A1.
4	A1058 Strategic Corridor Improvement (Coast Road)	Improvements to Newcastle city centre access from the A19 via the A1058 may make this route more attractive and therefore slightly reduce usage of the A1 NGWB by drivers coming from areas to the north of the A19 (such as Cramlington). It is considered that any rerouting impacts are likely to be small and largely offset by similar improvements to routes into Newcastle on the western side of the city centre.
5	Newcastle Northern Access Corridor (Phase 1)	Improvements in this location removing congestion could encourage traffic to use the local road network rather than the A1 for certain movements thereby improving conditions on the A1 NGWB. However, the impact is likely to be small in this instance.
6	Lindisfarne Roundabout	Improvements to the A19 corridor may encourage traffic to use this route for strategic through trips rather than using the A1. Given that the percentage of A1 NGWB traffic making strategic through trips is currently low, the impact of strategic rerouting onto the A19 is likely to be small in scale.
7	Northern Access Corridor (Phase 2), Osborne Road-Haddricks Mill	Improvements in this location removing congestion could encourage traffic to use the local road network rather than the A1 for certain movements thereby improving conditions on the A1 NGWB. However, the impact is likely to be small in this instance.
8	Coach Lane and Tyne View Park (A191 junctions)	Improvements to the Newcastle city centre access from the A19 via the A191 may slightly reduce usage of the A1 NGWB by drivers coming from areas to the north of the A19 (such as Cramlington). It is considered that any rerouting impacts are likely to be small and largely offset by similar improvements to routes into Newcastle on the western side of the city centre.
9	A19 employment corridor access improvements (A191 to Silverlink North)	This scheme to improve a junction to the east of the A19 is unlikely to have a discernible impact on the A1 NGWB.

10	Sunderland Low Carbon Zone	This scheme includes improvements to junctions on the A19 in the vicinity of Sunderland which may encourage traffic to use the A19 for strategic through trips rather than using the A1. Given that the percentage of A1 NGWB traffic making strategic through trips is currently low, the impact of strategic rerouting onto the A19 is likely to be small in scale.
11	Central Metro Station Refurbishment	The refurbishment of Central Metro Station may encourage use of Metro services. This may lead to small levels of mode shift from car to Metro which may benefit the A1 NGWB. This is likely to be mainly in the northern section of the route where Metro services between the airport and city centre offer an alternative means of accessing Newcastle / Gateshead centres.
12	Horden Rail Station	This new station located between Hartlepool and Sunderland in Horden is unlikely to abstract much demand from the A1 NGWB
13	South Shields Transport Hub	Whilst this improvement to Metro and bus stations in South Shields may encourage public transport use in the region the impact on the A1 NGWB is likely to be small given its location.
14	Gateway Improvements	Improvements to gateway stations into the region are aimed at encouraging mode shift away from car for trips entering Tyne & Wear. This is turn will lead to some reductions in trips using the A1 NGWB.
15	Coalhouse Junction LNMS Scheme	Widening and partial signalisation works at this junction seek to reduce existing queues. This will mitigate the potential for traffic queuing back up slip roads onto the A1 mainline and causing a number of issues on that part of the route.
16	Seaton Burn & Fisher Lane Pinch Point	The pinch point scheme at this junction seeks to reduce existing queues. This will mitigate the potential for traffic queuing back onto the A1 mainline and causing a number of issues on that part of the route.
17	J63 Chester-le-Street Pinch Point Scheme	Improvement works at this junction seek to reduce existing queues. This will mitigate the potential for traffic queuing back onto the A1 mainline and causing a number of issues.
A	Urban Traffic Management and Control	Benefits of this scheme include better management of traffic in the region and improved public transport journey times and reliability. The changes should lead to better operation of the local road network and increased public transport attractiveness which in turn may result in fewer trips on the A1 NGWB.
B	Cycling Schemes	Encouraging cycling through delivery of cycling schemes has the potential for reducing car use. However, given that the specific schemes are not located on directly competing routes to the A1 NGWB the impact here is likely to be small.
C	Green Light to Work (Scooters Scheme)	This scheme aims to provide scooters to jobseekers or those requiring access to training or education from areas with poor public transport provision. As the scheme is aimed at those less likely to be car owners this is unlikely to reduce the number of cars on the A1 NGWB and may lead to increased numbers of vehicles (namely scooters) on certain parts of the road network.
D	Better Bus Areas Fund	Through reductions in delays on bus corridors and improvements to bus infrastructure this scheme is designed to encourage increased bus use which may reduce car usage on the A1 NGWB.
E	Local Sustainable Transport Fund	This scheme may lead to some reductions in car use on the A1 NGWB as measures are applied to encourage use of more sustainable modes for commuters and school pupils.

Table 4-8: Impact of Committed Local Schemes on A1 NGWB

ID	Scheme	Impact on Objectives (Does the scheme address existing and future priority problems on the Western bypass?)
18	A194/A185 'The Arches' junction	This scheme to improve a junction to the east of the A19 is unlikely to have a discernible impact on the A1 NGWB.
19	A1/A690 junction improvements	Junction improvement works associated with a nearby development site will improve the operation of J62 of the A1 thereby reducing the potential for queues extending onto the A1 mainline in this location.
20	A19/A189 Seaham / Murton Interchange	Improvements to the A19 corridor may encourage traffic to use this route for strategic through trips rather than using the A1. Given that the percentage of A1 NGWB traffic making strategic through trips is currently low, the impact of strategic rerouting onto the A19 is likely to be small in scale.
21	Improvements to the southern portal of the Tyne Tunnel	
22	Boldon Business Park Corridor Access	
23	Improvements to access from the A19 to the north bank of the Tyne (Swans site and Port of Tyne land)	
24	Sunderland Strategic Transport Corridor	Works to improve the access into Sunderland and encourage regeneration on this corridor are unlikely to significantly impact upon the A1 NGWB.
25	Durham Western Relief Road	This scheme to relieve congestion on the A167 to the west of Durham may lead to some local reassignment of traffic between junctions on the A1. However, the impact is likely to be contained on the southern end of the A1 NGWB where there are currently fewer issues.
26	Metro Enhancements	There are a number of different aspects to this scheme. Initially this involves replacing the existing Metro fleet and making changes to the maintenance systems. An improved Metro fleet may lead to additional trips being attracted to this mode away from car and therefore may lead to slight reductions in trips on the A1 NGWB. Longer term aspirations to extend the Metro network has potential for more significant mode shift on the A1 NGWB corridor, however these improvements sit outside the timescales of the current study and also have the potential for increasing A1 traffic in some locations if drivers were wishing to access P&R facilities on the new portions of the network.

Table 4-9: Impact of Proposed Local Schemes on A1 NGWB

4.6.4 A common theme emerging from the assessments in the tables above is that the local authority improvement schemes may in general reduce demand for travel on the A1 NGWB and therefore contribute to the study objective of addressing existing and future priority problems on the route. However, it would appear that none of the schemes will generate a large enough reduction in vehicles on the A1 NGWB to meet the objective in isolation.

4.6.5 Rather than tackling all the issues, the local authority schemes will complement the options being developed through this feasibility study with the section that follows providing more details on how this will occur.

Complementarity of A1 NGWB Options and Local Schemes

4.6.6 The options being assessed through this study complement the local area schemes in a number of ways. Improvements to the LRN provide additional benefits to drivers using both SRN and LRN through the area (for example drivers commuting to work in central Newcastle / Gateshead that also use A1 NGWB). Public transport schemes such as new P&R sites and bus priority / corridor improvements have the potential to reduce travel demand on the A1 NGWB and therefore complement the improvement schemes on the A1 by further mitigating congestion related issues. Specific synergies between the options identified within this study and the local area schemes are identified within Table 4-10.

Option(s)	Synergies with Local Schemes
Section1: Option 1B + J65 intervention + J66 intervention	• Improves access to proposed A167 P&R site (LA scheme 3) • A167 P&R site will further improve section 1 as drivers use the site to access central Gateshead rather than continuing round the A1 NGWB to use Askew Road / Lobley Hill junctions
Section 2: Option 2A + Option 2C + J71 intervention + J72 intervention	• Improves access to potential Metrocentre Metro line extension for P&R use (LA scheme 26) • Scotswood Bridgehead (LA scheme 1) may reduce demand on this section of the A1 by providing an alternative route to Metrocentre areas from the A1 north
Section 4: Option 4-6A + Option 4-6C + J79 intervention	• Improvements to A1 NGWB in sections 4-6 links with a number of local road network (LRN) improvements in the north of Newcastle (LA schemes 2, 5, 7 & 8) to improve overall journey into the city centre on both SRN and LRN • LRN improvements in the north of Newcastle may reduce demand on the A1 NGWB in this section as local routes become more attractive
Technology	• Could potentially be linked with UTMC to better manage traffic across both SRN and LRN (LA scheme A)
Section: J62 to J64 J62 intervention + J64 intervention	• J62 intervention may tackle some of the issues that are the focus of the proposed A1/A690 junction improvement scheme (LA scheme 19) • LA schemes (14 & 25) around Durham may reduce demand for travel at these junctions
Section J67 to J71 J68 intervention + J71 intervention	• Scotswood Bridgehead (LA scheme 1) may reduce demand at junction 71 by providing an alternative route to Metrocentre areas from the A1 north

Table 4-10: Synergies with Local Schemes

4.6.7 Wider area sustainable transport schemes (LA schemes 11, 14, 26 & A-E) will all contribute to a greater or lesser extent to reducing demand for car use along the route

and therefore complement all of the interventions.

4.7 Summary of Initial Sifting

4.7.1 In summary, the following six mainline options and seven junction options emerged from the sifting process to be further assessed using the option assessment framework (OAF):

- Option 1B: Online widening to Dual 3 Lane All Purpose between J65 and J67 plus new offline structure to replace Allerdene Railway Bridge;
- Option 2A: Closure of J72 and online Dual 3 Lane All Purpose widening between J71 – J73;
- Option 2C: Closure of J72 and 3 narrow lanes with 50mph speed limit between J71 – J73;
- Option 4-6A: Online Dual 3 All Purpose widening between J74 – J79;
- Option 4-6C: Narrow lanes widening with reduced speed limit between J74 – J79;
- Information technology scheme for the whole route. To include Variable Message Signs, CCTV etc;
- Junction 62: Widening of northbound diverge slip to three lanes;
- Junction 65: Extend existing three lanes at approach to stop/give way line on the southbound diverge slip onto A1231;
- Junction 66: Full signalisation of junction and additional lanes on slip roads;
- Junction 68: Widening northbound off slip to three lanes;
- Junction 71: Widening of diverge slips to three lanes at southbound approach to Hollinside Road stop/give way line;
- Junction 72: Closure of Swallwell slip roads (in absence of Option 2A or 2C); and
- Junction 79: Widening of A1 northbound diverge slip road to three lanes at approach to stop line on nearside and offside. Extend A1 southbound diverge slip roads to three lanes at approach to stop line.

5 Development and Assessment of Potential Options

5.1 Introduction

5.1.1 This chapter includes the results of the assessment of the options that made it through the sifting process described in Chapter 4. Furthermore, the tools and methods applied as part of the assessment process are detailed.

5.2 Approach to Appraisal

5.2.1 The appraisal of the options is undertaken based on the Option Assessment Framework included as Appendix A to WebTAG: Transport Appraisal Process. This includes a range of different areas for assessment that fall within the following categories:

- Strategic Fit
- Value for Money
    - Impact on the Economy
    - Impact on the Environment
    - Impact on the Society
    - Public Accounts
    - Distributional Impacts
    - Indicative Benefit Cost Ratio
- Financial Case
- Delivery Case
- Commercial Case

5.2.2 The two principal methods for appraisal within each assessment area are as follows:

- **Qualitative Assessment**: a descriptive analysis of the likely impacts of the intervention in the area based upon available evidence. Includes scoring the level of impact using a seven point scale.
- **Quantitative Assessment**: using various appraisal tools to quantify the level of impact in the assessment area and then monetising this impact using values provided by WebTAG guidance.

5.2.3 Within the current study stage (Stage 2) the assessment undertaken is largely qualitative with only the cost estimates being quantified and the traffic model being used to provide an indication of the level of journey time benefits. Additional impacts will be quantified during Stage 3 as part of the development of the SOBCs for the options. The definitions of the 7 point scale are shown below.

1 = Large Adverse	2 = Moderate Adverse	3 = Slight Adverse	4 = Neutral	5 = Slight Beneficial	6 = Moderate Beneficial	7 = Large Beneficial

Table 5-1: 7-Point Scale

5.2.4 The assessment draws on the evidence and data collected as part of Stage 1 of the study. The appraisal was undertaken using expertise in various fields such as traffic modelling and environmental assessment. The methodologies applied in these fields are discussed below.

5.3 Traffic Modelling

Base Model

5.3.1 The traffic model being used for this assessment is the previously developed Dynameq mesoscopic model of the strategic road network in the Tyne and Wear region (known as NESMM). This model is calibrated and validated to a November 2012 base year and has been used to assess a number of previous schemes within the study area. It should be noted that whilst the model is not fully WebTAG compliant (for instance it contains no information on trip purpose and no direct means of undertaking variable demand modelling) it represents a reasonable tool for assessing the impact of interventions at this stage of the study.

Time Periods

5.3.2 The model covers the AM and PM peak periods, but to fully reflect any non-peak disbenefits of reduced speed limits associated with narrow lane options, an indicative Inter Peak has been produced based upon summing the AM & PM peak demand matrices (to remove tidality) and factoring to Inter Peak traffic levels based on observed count data.

Future Year Modelling

5.3.3 A series of future year demand matrices (2015, 2020 and 2030) are in existence which include traffic growth from specific development sites and are ultimately constrained to TEMPRO growth forecasts (for light vehicles) and Road Transport Forecasts (RTF) (for heavy vehicles). For this stage of the study the 2020 models are used for the assessment. Table 5-2 contains a summary of overall traffic growth in the model area in each time period.

Traffic Growth	AM (08:00-09:00)	IP (11:00-15:00)	PM (17:00-18:00)
2012 - 2020	8.7%	8.1%	7.5%

Table 5-2: Traffic Growth

5.3.4 A 'Do Minimum' model containing committed highways schemes was produced to act as the baseline against which each option was compared. The highways schemes that were included were the Coalhouse to Metrocentre scheme and the Seaton Burn pinch point scheme.

5.3.5 Separate versions of the model were developed for each of the mainline intervention options (apart from the technology option which cannot readily be assessed within the traffic model). As the model isn't validated in detail on the offline sections of the network

and due to the relative small scale of the junction interventions it was not considered to be a suitable tool to assess the impact of these interventions. The assessment of the junction interventions was therefore entirely qualitative.

Model Outputs

5.3.6 The key output obtained from the traffic model is overall vehicle travel time in the network within the peak hours. This statistic enables a comparison of travel times in the study area with and without each of the interventions in place and therefore an indication of the overall journey time impact of the interventions. These outputs are used to inform the qualitative assessment at Stage 2.

5.4 Environmental Assessment

5.4.1 Each individual environmental discipline followed a set methodology as outlined below.

Air Quality (AQ)

5.4.2 The AQ assessment is qualitative only, based on a review of readily available data including existing air quality monitoring information from the Local Authority and the DEFRA website, mapping data to identify the location of sensitive receptors and professional judgement on the likely changes in air pollutant concentrations due to each of the scheme options. The assessment considers the proximity of Air Quality Management Areas to the proposed interventions, and the existence of areas which are currently predicted not to be compliant with the EU Limit Values.

Greenhouse Gases

5.4.3 The impact on greenhouse gases has been qualitatively assessed through a review of existing traffic flows and speeds on the A1 and forecast traffic growth. The anticipated impact of the options on these values has been used to estimate the scheme effects on greenhouse gas emissions.

Noise

5.4.4 The noise appraisal is a high-level evaluation of significance of potential effects. This requires an estimation of the changes in noise emissions from relevant road segments, based on the content of the proposal e.g. realignments, construction of additional lanes, change in traffic flows etc.

5.4.5 An estimate is made of numbers of people in the area likely to be annoyed, providing high-level analysis of population densities with respect to likely change in noise distribution/propagation.

Landscape

5.4.6 The landscape appraisal is deduced from baseline data that is readily available from local environmental/planning sources. The data is collated and reviewed to enable a local character to be established and key receptors identified.

5.4.7 All designated sites are identified along with their sensitivity and distance from the proposed scheme, professional judgement is applied to assess the likely change in character due to each of the options.

Townscape

5.4.8 All baseline data that is readily available from local environmental/planning sources is collated and reviewed to establish urban characteristics. The important visual receptors are identified and professional judgement is applied to assess the likely change in view and townscape due to each of the options.

Biodiversity

5.4.9 The biodiversity appraisal is undertaken by establishing the biodiversity characteristic of the area from baseline data that is readily available from local environmental/planning sources. Designated sites such as Ramsar, SSSI, LNR etc. are identified and assessed for potential impacts from the options.

Historic Environment

5.4.10 The historic character is established using local planning information and data from English Heritage, listed buildings online, and national and county monument records. Designated sites are identified and the potential impact upon them from the options is discussed and quantified

Water Environmental

5.4.11 All baseline data that is readily available from local environmental/planning sources including Environment Agency data is collated and reviewed to identify the likelihood and severity of potential impact given the nature of each of the options.

5.5 Cost Estimates

5.5.1 HA Commercials have developed cost estimates for each of the schemes. These include all preparation, supervision, works and land costs as well as the appropriate level of risk & uncertainty recommended at this stage.

5.5.2 The spend has been profiled over the period 2014 to 2022 and are calculated in factor cost unit of account and presented in 2010 prices.

5.6 Appraisal Results

5.6.1 Appendix C contains the four sets of tables detailing the results of the mainline improvement scheme assessment exercise. Where there are two alternative interventions proposed on the same section the results for both interventions have been presented side by side in the same table for ease of comparison and to reduce replication of data.

5.6.2 Appendix D then presents the seven sets of assessment tables for the junction interventions.

5.6.3 Indicative drawings are included prior to each option assessment.

5.6.4 The conclusions that are drawn from the assessment results are presented within the following chapter.

6 Conclusions and Recommendations

6.1 Introduction

6.1.1 This chapter contains a summary of the option assessment results and the recommendations for the options to be taken forward to Stage 3: SOBC.

6.1.2 The additional appraisal to be undertaken in Stage 3 is also discussed.

6.2 Summary & Conclusions

6.2.1 A summary of the option scores for the assessment of strategic fit for the mainline schemes is presented in Table 6-1. A similar set of results is contained within Table 6-2 for the junction interventions. This includes the assessment of the options against specific regional and local policies as well as assessing how well the options meet the intervention specific objectives previously described in Table 2-7.

Assessment Area	Category	Objective	Option 1B	Option 2A	Option 2C	Option 4-6A	Option 4-6C	Tech Option
Regional Transport and Spatial Strategy	Regional Policy Alignment	Improve Economic Performance of Region	7	6	5	7	6	5
		'Doing more with less'	2	2	5	2	6	7
		Maintain and improve accessibility to jobs, housing and key services	7	5	5	6	6	5
		Reduction in the variability of journey times along the corridor	7	5	5	7	6	5
		Reduction in collisions, in particular incidents involving pedestrians.	6	6	5	6	5	5
	Local Policy Alignment	Supporting more housing developments in the area and wider region	6	5	5	7	6	4
		Maintaining air quality with regard to European legal standards.	5	4	4	4	4	4
Meeting Intervention Objectives	Scheme Objectives Fit	Economic Growth and Development	6	6	5	7	6	5
		Movement of Goods and Access to Transport Hubs	5	5	5	6	6	5
		Accessibility	7	5	5	6	6	5
		Journey Times	7	6	5	7	6	5
		Safety	6	6	5	6	5	6
		Resilience	6	5	5	6	5	6
		Environment	3	3	3	3	3	5
		Deliverability	2	2	4	2	5	3

Table 6-1: Strategic Fit Assessment – Mainline Interventions

Assessment Area	Category	Objective	J62	J65	J66	J68	J71	J72	J79
Regional Transport and Spatial Strategy	Regional Policy Alignment	Improve Economic Performance of Region	4	4	5	4	4	5	4
		'Doing more with less'	4	4	4	4	4	4	4
		Maintain and improve accessibility to jobs, housing and key services	4	5	5	5	5	4	4
		Reduction in the variability of journey times along the corridor	5	5	5	5	5	5	5
		Reduction in collisions, in particular incidents involving pedestrians.	4	4	4	4	4	6	4
	Local Policy Alignment	Supporting more housing developments in the area and wider region	4	4	4	4	4	4	4
		Maintaining air quality with regard to European legal standards.	4	4	4	4	4	4	4
Meeting Intervention Objectives	Scheme Objectives Fit	Economic Growth and Development	5	5	5	5	5	5	5
		Movement of Goods and Access to Transport Hubs	5	5	5	5	5	5	5
		Accessibility	4	5	5	5	5	4	4
		Journey Times	5	5	5	5	5	5	5
		Safety	4	4	4	4	4	6	4
		Resilience	5	5	5	5	5	5	5
		Environment	3	3	3	3	3	3	3
		Deliverability	7	7	6	7	6	7	7

Table 6-2: Strategic Fit Assessment – Junction Interventions

6.2.2 All mainline options score beneficially against the majority of strategic policy and objective goals with the larger scale options (1B, 4-6A and 4-6C) scoring the highest. However, these larger scale options tend to score lower on deliverability due to the extent of engineering works required to deliver these schemes.

6.2.3 The smaller scale junction interventions are not likely to have as significant an impact as the mainline schemes so the strategic scores are lower. However, these schemes all score highly on deliverability as they involve much smaller scale works.

6.2.4 All mainline options may have a slight adverse environmental impact apart from the technology option. The details of the specific environmental impacts along with economic and societal impacts are summarised in Tables 6-3 and 6-4 which contain a summary of the scores from the Value for Money (VfM) sections of the option assessment.

Assessment Area	Category	Option 1B	Option 2A	Option 2C	Option 4-6A	Option 4-6C	Tech Option
Economy	Business Users & Transport Providers	7	6	5	7	6	5
	Reliability	7	5	5	7	6	5
	Regeneration	6	5	5	7	6	4
Environment	Noise	5	3	3	3	3	4
	Air Quality	5	4	4	4	4	4
	Greenhouse Gases	3	3	3	3	3	5
	Landscape	2	3	3	3	3	3
	Townscape	2	2	3	2	3	3
	Historic Environment	2	3	3	1	2	3
	Biodiversity	2	2	3	2	3	3
	Water Environment	3	3	3	3	3	3
Society Impact	Non-business users	6	6	5	7	6	5
	Physical Activity	4	4	4	4	4	4
	Journey Quality	5	5	5	5	5	5
	Accidents	6	6	5	6	5	6
	Security	4	4	4	4	4	5
	Access to Services	4	4	4	4	4	4
	Affordability	5	5	5	5	5	5
	Severance	4	4	4	4	4	4
	Option Values	4	4	4	4	4	4
Public Accounts	Cost to Transport Budget (PVC)	£292m	£61m	£40m	£336m	£112m	£134m
	Indirect Tax Revenues	3	3	3	3	3	3
Indicative Benefit Cost Ratio	Cost to Private Sector	£0	£0	£0	£0	£0	£0
	Indicative Net Present Value	N/A	N/A	N/A	N/A	N/A	N/A

Table 6-3: VfM Assessment – Mainline Interventions

Assessment Area	Category	J62	J65	J66	J68	J71	J72	J79
Economy	Business Users & Transport Providers	5	5	5	5	5	5	5
	Reliability	5	5	5	5	5	5	5
	Regeneration	4	4	4	4	4	4	4
Environment	Noise	3	3	3	3	3	5	3
	Air Quality	4	4	4	4	4	4	4
	Greenhouse Gases	5	5	4	5	5	3	5
	Landscape	3	3	3	3	3	3	3
	Townscape	3	3	3	3	3	3	3
	Historic Environment	4	3	3	3	3	3	3
	Biodiversity	3	3	3	3	3	4	3
	Water Environment	4	4	4	4	4	3	4
Society Impact	Non-business users	5	5	5	5	5	5	5
	Physical Activity	4	4	4	4	4	4	4
	Journey Quality	4	4	4	4	4	4	4
	Accidents	4	4	4	4	4	5	4
	Security	4	4	4	4	4	4	4
	Access to Services	4	4	4	4	4	4	4
	Affordability	5	5	5	5	5	4	5
	Severance	4	4	4	4	4	4	4
	Option Values	4	4	4	4	4	4	4
Public Accounts	Cost to Transport Budget (PVC)	£0.93m	£1.39m	£2.05m	£2.38m	£0.92m	£1.19m	£1.23m
	Indirect Tax Revenues	3	3	3	3	3	3	3
Indicative Benefit Cost Ratio	Cost to Private Sector	£0	£0	£0	£0	£0	£0	£0
	Indicative Net Present Value	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table 6-6: VfM Assessment – Junction Interventions

6.2.5 Options 1B and 4-6A generate the highest level of benefit to the economy and society. However, these are the two most expensive options. Additionally, these two options lead to the highest level of environmental disbenefit due to the scale of works required.

6.2.6 The level of benefit to the economy and society generated by the junction interventions is smaller than the mainline schemes. However, as the junction schemes are much smaller in scale the environmental impacts are also less adverse.

6.2.7 It should be noted that all but one of the options are predicted to have a neutral impact on air quality. This is due to the schemes leading to more freely flowing traffic resulting in lower emissions but consequently attracting increased traffic flows. Until more detailed air quality modelling is undertaken it is not possible to understand whether the increased flows completely offset the benefits of more freely flowing traffic. Option 1B, where the road alignment significantly changes, is the only scheme predicted to have a slight beneficial impact on air quality as it involves the alignment of the A1 moving further away from residential areas.

6.2.8 The majority of options are predicted to have a negative impact on noise due to more freely flowing traffic generating more noise than slow moving traffic. As part of future, more detailed scheme design noise mitigation measures would need to be provided to meet the intervention specific environmental objective.

6.2.9 Finally, the results of the financial, delivery and commercial cases are summarised in Tables 6-7 and 6-8.

Assessment Area	Category	Option 1B	Option 2A	Option 2C	Option 4-6A	Option 4-6C	Tech Option
Capital and Revenue Costs	Outturn cost to implement	£427m	£87m	£57m	£490m	£157m	£193m
	Operating and Maintenance Costs	7	4	4	2	3	3
Funding Assumptions	Funding Allocation	N/A	N/A	N/A	N/A	N/A	N/A
Likely Delivery Agents		5	6	6	6	6	6
Stakeholder Acceptability		6	6	6	6	6	6
Public Acceptability / Interest		6	4	4	3	5	5
Route to Market		3	6	6	4	6	6

Table 6-7: Financial, Delivery and Commercial Case Assessment – Mainline Interventions

Assessment Area	Category	J62	J65	J66	J68	J71	J72	J79
Capital and Revenue Costs	Outturn cost to implement	£1.28m	£1.89m	£2.82m	£3.29m	£1.27m	£1.62m	£1.67m
	Operating and Maintenance Costs	4	4	4	4	4	4	4
Funding Assumptions	Funding Allocation	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Likely Delivery Agents		6	6	6	6	6	6	6
Stakeholder Acceptability		6	6	6	6	6	6	6
Public Acceptability / Interest		6	6	6	6	6	5	6
Route to Market		6	6	6	6	6	6	6

Table 6-8: Financial, Delivery and Commercial Case Assessment – Junction Interventions

6.2.10 Option 1B provides a large benefit to maintenance costs as the existing Allerdene Bridge has ongoing maintenance issues which are forecast to worsen in the future with a bridge replacement becoming necessary in the medium-long term. The other options lead to insignificant impacts on maintenance or slight increases above current levels due to additional lanes being provided.

6.2.11 In terms of scheme delivery Option 4-6A is likely to cause the most issues with potential compulsory purchase of properties adjacent to the A1 as well as more complex works to

existing structures and retaining walls. Option 1B also presents some challenges due to construction of the new bridge and third party land required for the new alignment.

6.2.12 As the junction interventions are all relatively small in scale they are deemed to be easier to deliver and all cost under £5m.

6.2.13 Taking account of the above impacts enables a qualitative BCR to be estimated for each of the options. The results of this are presented in Tables 6-9 and 6-10.

Assessment Area	Option 1B	Option 2A	Option 2C	Option 4-6A	Option 4-6C	Tech Option
Indicative Benefit Cost Ratio	Medium: BCR = 1.5-2	Low: BCR = 1-1.5	Medium: BCR = 1.5-2	Low: BCR = 1-1.5	High: BCR = 2-4	Medium: BCR = 1.5-2

Table 6-9: Qualitative BCR – Mainline Interventions

Assessment Area	J62	J65	J66	J68	J71	J72	J79
Indicative Benefit Cost Ratio	Medium: BCR = 1.5-2	High: BCR = 2-4	High: BCR = 2-4	High: BCR = 2-4	Medium: BCR = 1.5-2	Medium: BCR = 1.5-2	Medium: BCR = 1.5-2

Table 6-10: Qualitative BCR – Junction Interventions

6.2.14 It is estimated that Option 4-6C will lead to the highest BCR value for the mainline interventions. This is a fairly large scale scheme that delivers a reasonable level of benefit yet sits within the existing highway boundary so is less expensive than some of the other options (for comparison the Coalhouse to Metrocentre scheme which similarly provides narrow lanes covers a slightly shorter distance at a slightly lower cost and delivered a BCR in the region of 5).

6.2.15 Option 1B provides a high level of benefit but has a very high cost. It is estimated that this will lead to a medium BCR when maintenance savings are accounted for.

6.2.16 Option 2C is also predicted to have a medium BCR, this only covers a short stretch of the route so the generated benefits are smaller than Options 1B and 4-6C. The benefits of this scheme will also be eroded by potential additional delays caused on the local road network due to the rerouting of traffic originally using junction 72.

6.2.17 It is difficult to quantify the full benefits of the technology option but accident savings and journey time reliability improvements will result from the scheme. This scheme should not be excluded until more work is undertaken to quantify the benefits and fully understand the VfM level.

6.2.18 Options 2A and 4-6A are considered to represent low value for money due to the cost required to deliver these options.

6.2.19 As the costs of the junction interventions are relatively low it is considered that all will lead to a medium or high BCR. The improvements to J65, J66 and J68 are more significant in scale and therefore are forecast to generate more benefits. The interventions at the other four junctions are generally resolving smaller scale issues or mitigating the impact of issues elsewhere rather than directly tackling the root cause of the problem (for example the J79 intervention will reduce the potential for traffic queuing back onto the A1 mainline but the cause of congestion in this location is on the local road network on the A1056).

6.3 Recommendations

6.3.1 Based on the conclusions above it is recommended that the following options are taken forwards to Stage 3: SOBC:

- Option 1B: J65 – J67 widening including Allerdene replacement (scheme length = 2.5 miles);
- Option 2C: J71 – J73 narrow lanes widening including J72 closure (scheme length = 0.4 miles);
- Option 4-6C: J74 – J79 narrow lanes widening (scheme length = 4.5 miles); and
- Technology Option: MIDAS, VMS & CCTV (scheme length = 28 miles + 20 miles fibre optic link to rest of network at Barton).

6.3.2 Furthermore, it is recommended that all seven junction interventions be progressed to Stage 3: SOBC.

6.3.3 Options 2A and 4-6A will therefore not be considered any further due to the high scheme costs. The level of benefit generated by these options is not so much greater than their 2C and 4-6C counterparts that it warrants the additional cost and feasibility issues surrounding these schemes.

6.3.4 As part of the development of these options to SOBC level, it is recommended that an assessment is undertaken regarding the potential for delivering enhancements to non-motorised user (NMU) provision over the extents of each of the schemes. Providing NMU provision enhancements alongside the schemes will lead to improved accessibility which is one of the intervention specific objectives.

6.4 Stakeholder Feedback

6.4.1 The findings discussed within this report were presented to the Stakeholder Reference Group for the study. The stakeholders were supportive of the findings and the schemes being taken forward to Stage 3: SOBC and continued to stress the need for intervention on the route.

6.4.2 There was strong desire amongst stakeholders to see the technology option delivered and where possible to provide this scheme alongside the proposed highway schemes. Improvements to junctions 65 (Birtley), 77 (Ponteland Road) and 79 (North Brunton) were also highlighted as stakeholder priorities given the impact these junctions have on the LRN.

6.4.3 Finally, stakeholders stressed the importance of delivering NMU enhancements as part of any scheme that is progressed,

6.5 Next Steps

6.5.1 Within Stage 3 the recommended options will be subjected to more detailed appraisal and monetisation of benefits. Firstly some additional qualitative assessment will be undertaken and then a number of scheme impacts will be monetised.

Additional Qualitative Assessment

6.5.2 There is potential for the options to have wider impacts on markets other than transport

and generate additional economic benefits other than transport user benefits. A qualitative assessment of these wider impacts will be undertaken in line with WebTAG guidance.

6.5.3 To understand the distribution of benefits to different social groups WebTAG specifies a method for assessing distributional impacts. This will be undertaken in Stage 3 through application of GIS analysis.

Quantitative Assessment

In order to develop an indicative BCR as part of the SOBC a number of scheme impacts are to be quantified and monetised. Through the use of spreadsheet models based on WebTAG principles the scheme economic appraisal will be undertaken. Table 6-5 summarises the impacts that are to be quantified along with the outline methodology for doing so.

Impact	Quantification Methodology
Journey Times	• Traffic modelling (2020 & 2030) used to obtain journey time changes resulting from the schemes
Vehicle Operating Costs (VOC)	• Traffic modelling (2020 & 2030) used to obtain changes in speeds resulting from the schemes • WebTAG approach used to calculate change in VOC caused by change in average speeds
Accidents	• COBALT to assess basic changes in accident numbers and severity, and monetisation of these benefits • Heuristic assessment of other safety-relevant elements of the scheme not captured by COBALT (using data sources such as RoSPA, POPE and iRAP to predict safety benefits for these additional elements)
Air Quality	• Use air quality valuation workbook to monetise regional air quality impacts • Use traffic modelling results as inputs
Indirect Tax	• Change in VOC will lead to indirect tax impacts due to changes in fuel usage • Calculated using WebTAG recommended approach

Table 6-5: Impacts to be Quantified

6.5.4 Whilst this approach is possible for the mainline interventions the scale of the junction interventions and lack of detailed junction operation in the model means that no benefits can be quantified for the junction intervention in Stage 3.

6.5.5 The key output of Stage 3 of the study is an SOBC for each of the preferred options. Identification of the appraisal areas which will require further work should the options be progressed will also be carried out as part of Stage 3.

Appendix A

List of Sections – Interventions and Pre – EAST Sift Tools

A1 GNWB - List of Sections and Interventions (Final Version Rev A)

Note: Interventions based on the assumption that all the mainline issues raised at section 19 are addressed by Coalhouse to Metrocentre Improvement scheme. However the junctions within this section which are not subject to any existing improvement schemes have been considered for intervention.

Intervention Ref	Description
A	Widening to 3 lanes
B	Widening to 4 lanes
C	Widening to 5 lanes
D	3 narrow lanes or 3 full lanes with discontinuous hardshoulder within existing highway boundary
E	4 narrow lanes or 4 full lanes with discontinuous hardshoulder within existing highway boundary
F	Offline dualling
G	Closure of Slip road
H	Pavement strengthening subject to investigation
I	Earthworks strengthening subject to investigation
J	Restrengthening of existing structures subject to investigation
K	Replacement of existing structures
L	Reduced speed limit to 50mph
M	Laybys
N	Average speed cameras
O	Variable Message Signs (VMS)
P	Close Circuit Television (CCTV)
Q	Emergency Roadside Telephone (ERT)
R	Motorway Incident Detection and Automated Signalling (MIDAS)
S	Gantry mounted lane signals
T	Observation points
U	Marker posts
V	Low level crossing
W	Junction signalisation
X	Widening of slip roads to 2 lanes
Y	Widening of diverge slip roads to 3 lanes at approach to stop/give way line or widening roundabout circulatory
Z	Hardshoulder Running During Peak Hour

Section Ref:	Northbound and Southbound
1	Carrville Junction (J62)
2	Carrville Through Mainline (nose to nose)
3	Carville to Chester le Street Mainline
4	Chester le Street Junction (J63)
5	Chester le Street Through Mainline (nose to nose)
6	Chester le Street to Washington Mainline
7	Washington Junction (J64)
8	Washington Through Mainline (nose to nose)
9	Washington Mainline to Birtley Bifurcation
10	Birtley Bifurcation Junction (J65)
11	Birtley Bifurcation Through Mainline (nose to nose)
12	Birtley Bifurcation to Eighton Lodge Mainline
13	Eighton Lodge Junction (J66)
14	Eighton Lodge Through Mainline
15	Eighton Lodge (J66) to Coalhouse Mainline (J67)
16	Coalhouse Junction (J67)
17	Coalhouse Through Mainline (nose to nose)
18	Allerdene Railway Bridge (Eighton Lodge to Coalhouse)
19	Lobley Hill Scheme (Coalhouse to Metrocentre)
J68	Lobley Hill Junction (J68)
J70	Dunston Junction (J70)
20	Metrocentre Junction (J71)
21	Metrocentre Through Mainline (nose to nose)
22	Metrocentre to Swalwell Mainline
23	Swalwell Junction (J72)
24	Swalwell to Derwenthaugh Mainline
25	Derwenthaugh Junction (J73)
26	Derwenthaugh Through Mainline (nose to nose)
27	Derwenthaugh to Scotswood Mainline
28	River Tyne Blaydon Bridge (Darwenthaugh to Scotswood)
29	Scotswood Junction (J74)
30	Scotswood to Denton Island
31	Denton Island Junction (J75)
32	Denton Island Through Mainline (nose to nose)
33	Denton Island to Stamfordham Road
34	Stamfordham Road Junction (J76)
35	Stamfordham Road Through Mainline (nose to nose)
36	Stamfordham Road to Ponteland Road
37	Ponteland Road Junction (J77)
38	Ponteland Road Through Mainline (nose to nose)
39	Ponteland Road to Kingston Park Mainline
40	Kingston Park Junction (J78)
41	Kingston Park Through Mainline (nose to nose)
42	Kingston Park to North Brunton Mainline
43	North Brunton Junction (J79)
44	North Brunton Through Mainline (nose to nose)
45	North Brunton to Seaton Burn Mainline
46	Seaton Burn Junction (J80)

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See end of sheet for identified problems and objectives.
See Intervention Matrix (Sheet 2) for Intervention Codes.

Qualitative assessment against identified problems	Qualitative assessment against identified objectives	Deliverability (e.g. political, planning, timescale or third party issues)	Feasibility (e.g. physical constraint, land availability and design standards)
4 Large beneficial impact	4 Large beneficial impact		
1 Beneficial impact	1 Beneficial impact		
0 Neutral / marginal impact	0 Neutral / marginal impact	Deliverable in theory	Feasible in theory
-1 Adverse impact	-1 Adverse impact	Deliverable but with challenges	Feasible but with challenges
-4 Large adverse impact	-4 Large adverse impact	Very difficult to deliver	Not feasible / significant challenges

Initial Sifting Criteria
Each option must meet the following sifting criteria to be considered further within EAST:
1: Overall moderate impact against identified problems (Appraisal score >4, see East Conversion below)
2: Overall moderate fit with route objectives (Appraisal score >3, see East conversion below)
3: Must be deliverable in theory
4: Must be feasible in theory

Reference (Route Section-Intervention)	Option Description	Problems (EAST Scale of Impact)										Objectives (EAST Fit with Other Objectives)										Deliverability	Feasibility	Initial Sifting Criteria Prior to EAST				Take to EAST	
		1	2	3	4	5	6	7	8	9	Total	1	2	3	4	5	6	7	8	9	-	Total			1	2	3	4		
1-Y	Widening of northbound diverge slip road to 3 lanes at approach to stop/give way line. Depending on queue lengths on diverge slip roads. No capacity issues identified on the southbound slips in stage 1 report.	2	2	2	0	0	0	0	0	0	6	2	2	1	0	1	-1	1	-1	0		5	Deliverable in theory	Feasible in theory	✓	✓	✓	✓	✓	
2-A to 2F	No capacity issues identified within this section in stage 1 report.										0											0			×	×	✓	✓	×	
3A to 3F	No capacity issues identified within this section in stage 1 report.										0											0			×	×	✓	✓	×	
4-Y	Junction 63 - extend existing 3 lanes at northbound diverge slips road approach to stop line. Depending on queue lengths on diverge slip roads. No capacity issues identified on the southbound slips in stage 1 report.	2	2	2	0	0	0	0	0	0	6	2	2	1	0	1	-1	1	-1	0		5	Deliverable in theory	Feasible in theory	✓	✓	✓	✓	✓	
5-A	Widen to 3 lanes with hardshoulder and widen 2 no. underbridges (Junction 63) on Northbound only, as no capacity issues identified on the southbound in stage 1 report.	1	1	0	0	0	0	0	0	0	2	1	1	1	0	1	-1	1	-1	0		3	Deliverable but with challenges	Feasible but with challenges	×	×	✓	✓	×	
5-D	3 lanes with discontinuous hardshoulder within existing highway boundary and alterations to slip roads diverge/merge layout on Northbound only, as no capacity issues identified on the southbound in stage 1 report.	1	1	0	0	0	0	0	0	0	2	1	1	1	-1	1	-1	1	1	-1		3	Deliverable in theory	Feasible but with challenges	×	×	✓	✓	×	
5-J	Restrengthening of existing 2 no. underbridges (Junction 63) subject to loading assessment.	1	1	0	0	0	0	0	1	0	3	1	1	1	1	0	-1	1	1	0		5	Deliverable in theory	Feasible but with challenges	×	✓	✓	✓	×	
5-K	Replacement of existing 2 no. underbridges (Junction 63) subject to loading assessment	1	1	0	0	0	0	0	1	0	3	1	1	-1	1	1	-1	1	1	0		4	Deliverable but with challenges	Feasible but with challenges	×	✓	✓	✓	×	
5-Z	Hardshoulder running during peak hours on Northbound only, as no capacity issues identified on the southbound in stage 1 report.	2	2	0	0	0	0	0	0	0	4	2	2	2	0	1	-1	1	1	0		8	Deliverable in theory	Feasible in theory	×	✓	✓	✓	×	
6-B	Widen to 4 lanes with hardshoulder on Northbound only, starting from approx. 350m after J63 merge nose to avoid interfering with 2no. residential properties. To include for replacement of 1no. VMS Gantry and widening of 1no. culvert. No capacity issues identified on the southbound in stage 1 report.	2	2	0	0	0	0	0	0	0	4	2	2	1	0	1	-1	1	-1	0		5	Deliverable in theory	Feasible but with challenges	×	✓	✓	✓	×	
6-J	Restrengthening of existing 2 no.culverts subject to loading assessment.	2	2	0	0	0	0	0	1	0	5	2	2	1	1	1	-1	1	1	0		8	Deliverable in theory	Not feasible / significant challenges	✓	✓	✓	×	×	Only feasible if 6B or 6Z goes through
6-K	Replacement of existing 2 no. culverts subject to loading assessment.	2	2	0	0	0	0	0	1	0	5	2	2	-1	1	1	-1	1	-1	0		4	Deliverable in theory	Not feasible / significant challenges	✓	✓	✓	×	×	Only feasible if 6B or 6Z goes through
6-Z	Hardshoulder running during peak hours on Northbound only, as no capacity issues identified on the southbound in stage 1 report.	2	2	0	0	0	0	0	0	0	4	2	2	2	0	1	-1	1	1	0		8	Deliverable in theory	Feasible in theory	×	✓	✓	✓	×	Only feasible if 6B or 6Z goes through
7-J	Restrengthening of existing Western Highway A1(M) underbridge. Subject to loading assessment.	0	2	2	0	0	0	0	1	0	5	2	2	1	1	1	-1	1	1	0		8	Deliverable in theory	Feasible but with challenges	✓	✓	✓	✓	✓	
7-X	Widening of northbound merge slip road to 2 lanes and widen 1no. Underbridge (A1M). No capacity issues identified on the southbound in stage 1 report.	0	2	2	1	0	0	0	0	0	5	2	2	1	0	1	-1	1	-1	0		5	Deliverable in theory	Feasible but with challenges	✓	✓	✓	✓	✓	
8-B	Widen to 4 lanes with hardshoulder, widen 1no underbridge (Vigo Lane) and alterations to slip roads diverge/merge layout northbound only, as no capacity issues identified on the southbound in stage 1 report.	2	2	0	0	0	0	0	0	0	4	2	2	1	0	1	-1	1	-1	0		5	Very difficult to deliver	Not feasible / significant challenges	×	✓	×	×	×	Not deliverable/feasible due to Washington Services requiring major alterations
8-E	4 lanes with discontinuous hardshoulder within existing highway boundary and alterations to slip roads diverge/merge layout on Northbound only, as no capacity issues identified on the southbound in stage 1 report.	2	2	0	0	0	0	0	0	0	4	2	2	2	-1	1	-1	1	1	-1		6	Very difficult to deliver	Not feasible / significant challenges	×	✓	×	×	×	Not deliverable/feasible due to Washington Services requiring major alterations
8-J	Restrengthening of existing 1 no. underbridge (Vigo Lane) subject to loading assessment.	2	2	0	0	0	0	0	2	0	6	2	2	1	1	1	-1	1	1	0		8	Deliverable in theory	Not feasible / significant challenges	✓	✓	✓	×	×	Only feasible if 8B, 8E or 6Z goes through
8-K	Replacement of existing 1 no. underbridge (Vigo Lane) subject to loading assessment	2	2	0	0	0	0	0	2	0	6	2	2	-1	1	1	-1	1	1	0		6	Deliverable but with challenges	Not feasible / significant challenges	✓	✓	✓	×	×	Only feasible if 8B, 8E or 6Z goes through
8-Z	Hardshoulder running during peak hours. Subject to changes to service station slip roads	2	2	0	0	0	0	0	0	0	4	2	2	2	0	1	-1	1	1	0		8	Very difficult to deliver	Not feasible / significant challenges	×	✓	×	×	×	Not deliverable/feasible due to Washington Services requiring major alterations
9-B	Widen to 4 lanes with hardshoulder, including replacement of 1no overbridge abutments (Washington highway) and 2no. footbridge piers, as well as relocation of 2no. Overhead traffic sign gantries. Subject to closure or relocation of washington services slip roads.	2	2	0	0	2	0	0	0	0	6	2	2	1	0	1	-1	1	-1	0		5	Very difficult to deliver	Not feasible / significant challenges	✓	✓	×	×	×	Not deliverable/feasible due to Washington Services requiring major alterations
9-G	Closure of washington services slip roads	2	2	0	0	2	0	0	0	0	6	2	2	-4	0	-2	2	1	2	0		5	Very difficult to deliver	Not feasible / significant challenges	✓	✓	×	×	×	Not deliverable/feasible due to Washington Services requiring major alterations
9-Z	Hardshoulder running during peak hours. Subject to closure or relocation of washington services slip roads.	2	2	0	0	2	0	0	0	0	6	2	2	2	0	1	-1	1	1	0		8	Very difficult to deliver	Not feasible / significant challenges	✓	✓	×	×	×	Not deliverable/feasible due to Washington Services requiring major alterations
10-X	Widening of northbound merge slip road to 2 lanes.	2	2	2	1	0	0	0	0	0	7	2	2	1	0	1	-1	1	-1	0		5	Deliverable in theory	Feasible but with challenges	✓	✓	✓	✓	✓	
10-Y	Extend existing 3 lanes at approach to stop/give way line on the southbound diverge slip	2	2	2	0	0	0	0	0	0	6	2	2	1	0	1	-1	1	-1	0		5	Deliverable in theory	Feasible in theory	✓	✓	✓	✓	✓	
11-A	Widen Northbound to 3 lanes with hard shoulder and alterations to slip roads diverge/merge layout.	2	2	2	0	1	0	0	0	0	7	2	2	1	0	1	-1	1	-1	0		5	Deliverable but with challenges	Feasible but with challenges	✓	✓	✓	✓	✓	
11-B	Widen Southbound to 4 lanes with hard shoulder and replacement of A194(M) overbridge abutment and alterations to slip roads diverge/merge layout	2	2	2	0	1	0	0	0	0	7	2	2	1	0	1	-1	1	-1	0		5	Deliverable but with challenges	Feasible but with challenges	✓	✓	✓	✓	✓	
11-D	3 lanes with discontinuous hardshoulder within existing highway boundary and alterations to slip roads diverge/merge layout on Northbound only.	2	2	0	0	1	0	0	0	0	5	2	2	2	-1	1	-1	1	1	-1		6	Deliverable but with challenges	Feasible but with challenges	✓	✓	✓	✓	✓	
11-E	4 lanes with discontinuous hardshoulder within existing highway boundary and alterations to slip roads diverge/merge layout on Southbound only.	2	2	0	0	1	0	0	0	0	5	2	2	2	-1	1	-1	1	1	-1		6	Deliverable but with challenges	Feasible but with challenges	✓	✓	✓	✓	✓	
12-B	Widening to 4 lanes and replacement of 1no. Footbridge	2	2	0	2	2	0	0	0	0	8	2	2	1	0	1	-1	1	-4	0		4	Deliverable but with challenges	Feasible but with challenges	✓	✓	✓	✓	✓	
12-F	Offline dualling to the east between Birtley Bifurcation and Eighton Lodge Junction	2	2	1	1	2	0	0	1	0	9	2	2	-4	0	1	1	1	-4	0		3	Very difficult to deliver	Not feasible / significant challenges	✓	×	×	×	×	Not deliverable/feasible due to lack of space, time scale and land availability.
13-W	Full Signalisation of Eighton Lodge Junction depending on queue lengths on diverge slip roads.	2	2	2	0	0	0	0	0	0	6	2	2	0	0	1	-1	1	0	1		6	Deliverable in theory	Feasible in theory	✓	✓	✓	✓	✓	
13-X	Extend existing 2 lanes on southbound merge slip subject to the alterations to merge layout.	2	2	2	0	0	0	0	0	0	6	2	2	1	0	1	-1	1	-1	0		5	Deliverable in theory	Feasible in theory	✓	✓	✓	✓	✓	
13-Y	Eighton Lodge Junction - Widening of A1 northbound diverge slip road to 3 lanes at approach to stop/give way line and extending existing 3 lanes at southbound approach to stop/give way line. Depending on queue lengths on diverge slip roads.	2	2	2	0	0	0	0	0	0	6	2	2	1	0	1	-1	1	-1	0		5	Deliverable in theory	Feasible in theory	✓	✓	✓	✓	✓	
14-A	Widening to 3 lanes and widening of 3no underbridges (Eighton Lodge Junction) and culvert.	2	2	0	0	1	0	0	0	0	5	2	2	1	0	1	-1	1	-1	0		5	Deliverable but with challenges	Feasible but with challenges	✓	✓	✓	✓	✓	
14-D	3 narrow lanes within existing highway boundary, including 3 narrow lanes on approx. 500m in section 12.	2	2	0	0	1	0	0	0	0	5	2	2	1	0	1	-1	1	1	0		7	Deliverable in theory	Feasible but with challenges	✓	✓	✓	✓	✓	
14-J	Restrengthening of existing 3no underbridges (Eighton Lodge Junction) and culvert subject to loading assessment	2	2	0	0	1	0	0	1	0	6	2	2	1	1	1	-1	1	1	0		8	Deliverable in theory	Feasible but with challenges	✓	✓	✓	✓	✓	
14-K	Replacement of existing 3no underbridges (Eighton Lodge Junction) and culvert subject to loading assessment	2	2	0	0	1	0	0	1	0	6	2	2	-1	1	1	-1	1	-1	0		4	Deliverable but with challenges	Feasible but with challenges	✓	✓	✓	✓	✓	
15-A	Widening to 3 lanes, including widening of Allerdene Railway underbridge	2	1	0	0	2	0	0	0	0	5	2	1	1	0	2	-1	1	-1	0		5	Deliverable but with challenges	Feasible but with challenges	✓	✓	✓	✓	✓	
15-B	Widening to 4 lanes, including replacement of Smithy Lane overbridge abutment and pier as well as widening of Allerdene Railway Underbridge and relocate overhead gantry	2	2	0	0	2	0	0	0	0	6	2	2	1	0	2	-1	1	-4	0		5	Deliverable but with challenges	Feasible but with challenges	✓	✓	✓	✓	✓	
15-D	3 narrow lanes within existing highway boundary	2	1	0	0	2	0	0	0	0	5	2	1	2	0	2	-1	1	1	0		8	Deliverable in theory	Feasible but with challenges	✓	✓	✓	✓	✓	

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A1 GNWB Feasibility Study

Pre-East Sift of Options
(Final Version Rev A)

Akilu Giwa
WSP

See end of sheet for identified problems and objectives.
See Intervention Matrix (Sheet 2) for Intervention Codes.

Qualitative assessment against identified problems	Qualitative assessment against identified objectives	Deliverability (e.g. political, planning, timescale or third party issues)	Feasibility (e.g. physical constraint, land availability and design standards)	Initial Sifting Criteria Each option must meet the following sifting criteria to be considered further within EAST:
2 Large beneficial impact	2 Large beneficial impact	Deliverable in theory	Feasible in theory	1: Overall moderate impact against identified problems (Appraisal score >4, see East Conversion below)
1 Beneficial impact	1 Beneficial impact	Deliverable but with challenges	Feasible but with challenges	2: Overall moderate fit with route objectives (Appraisal score >3, see East conversion below)
0 Neutral / marginal impact	0 Neutral / marginal impact	Very difficult to deliver	Not feasible / significant challenges	3: Must be deliverable in theory
-1 Adverse impact	-1 Adverse impact			4: Must be feasible in theory
-2 Large adverse impact	-2 Large adverse impact			

Reference (Route Section-Intervention)	Option Description	Problems (EAST Scale of Impact)										Objectives (EAST Fit with Other Objectives)										Deliverability	Feasibility	Initial Sifting Criteria Prior to EAST				Take to EAST	
		1	2	3	4	5	6	7	8	9	Total	1	2	3	4	5	6	7	8	9	-	Total			1	2	3	4		
15-F & 18F	Offline dualling to the west between Eighton Lodge and Coalhouse Junction	2	2	0	0	2	0	0	-1	0	7	2	2	-2	0	2	1	1	-2	0		4	Deliverable but with challenges	Feasible but with challenges	✓	✓	✓	✓	✓	
15-J & 18J	Restrengthening of Allerdene Railway underbridge	2	2	0	0	2	0	0	1	0	7	2	2	1	1	1	-1	1	1	0		8	Deliverable but with challenges	Feasible but with challenges	✓	✓	✓	✓	✓	
15-K & 18K	Replacement of Allerdene Railway underbridge	2	2	0	0	2	0	0	1	0	7	2	2	-1	1	1	-1	1	-1	0		4	Deliverable but with challenges	Feasible but with challenges	✓	✓	✓	✓	✓	
16-W	Full Signalisation of Coal House Junction if not covered by lobley hill scheme, depending on queue lengths on diverge slip roads.	2	2	2	0	0	0	0	0	0	6	2	2	0	0	1	-1	1	0	1		6	Deliverable in theory	Feasible in theory	✓	✓	✓	✓	✓	
16-Y	Widening of diverge slip roads to 3 lanes at approach to stop/give way line, depending on queue lengths on diverge slip roads.	2	2	2	0	0	0	0	0	0	6	2	2	1	0	1	-1	1	-1	0		5	Deliverable in theory	Feasible in theory	✓	✓	✓	✓	✓	
17-A	Widening to 3 lanes and widening of 1no underbridge (Coal House Junction)	2	2	0	0	1	0	0	0	0	5	2	2	1	0	1	-1	1	-1	0		5	Deliverable but with challenges	Feasible but with challenges	✓	✓	✓	✓	✓	
17-D	3 narrow lanes on northbound and 2 narrow lanes on southbound within existing highway boundary.	2	1	0	0	1	0	0	0	0	4	2	2	1	0	1	-1	1	1	0		7	Deliverable in theory	Feasible but with challenges	✗	✓	✓	✓	✗	
17-J	Restrengthening of existing 1no underbridge (Coal House Junction) subject to loading assessment	2	2	0	0	1	0	0	1	0	6	2	2	1	1	1	-1	1	1	0		8	Deliverable in theory	Feasible in theory	✓	✓	✓	✓	✓	
17-K	Replacement of existing 1no underbridge (Coal House Junction) subject to loading assessment	2	2	0	0	1	0	0	1	0	6	2	2	-1	1	1	-1	1	-1	0		4	Deliverable but with challenges	Feasible but with challenges	✓	✓	✓	✓	✓	
19	Lobley Hill Scheme										0											0			✗	✗	✓	✓	✗	
J68	Provide 3 narrow lanes within existing highway boundary at roundabout circulatory	2	2	2	0	0	0	0	0	0	6	2	2	2	0	1	-1	1	-1	0		6	Deliverable in theory	Feasible in theory	✓	✓	✓	✓	✓	
	Widening northbound diverge slip roads to 3 lanes at approach to stop/give way line, depending on queue lengths on diverge slip roads. (risk of potential for widening pedestrian subway)	2	2	2	0	0	0	0	0	0	6	2	2	1	0	1	-1	1	-1	0		5	Deliverable in theory	Feasible in theory	✓	✓	✓	✓	✓	
J70	Extend exiting 2 lanes on the northbound and southbound diverge slip roads	0	2	2	0	0	0	0	0	0	4	2	2	1	0	1	-1	1	-1	0		5	Deliverable in theory	Feasible in theory	✗	✓	✓	✓	✗	
	Widening northbound and southbound diverge slip roads to 3 lanes at approach to stop/give way line, depending on queue lengths on diverge slip roads.	0	2	2	0	0	0	0	0	0	4	2	2	1	0	1	-1	1	-1	0		5	Deliverable in theory	Feasible in theory	✗	✓	✓	✓	✗	
20-X	Widening of southbound diverge slip road towards St. Michaels Way to 2 lanes depending on peak hour traffic flow on the slip road and if not covered by Lobley Hill Scheme.	0	2	2	0	0	0	0	0	0	4	2	2	1	0	1	-1	1	-1	0		5	Deliverable in theory	Feasible in theory	✗	✓	✓	✓	✗	
20-Y	Widening of diverge slip roads to 3 lanes at approach to Hollison Road stop/give way line if not covered by Lobley Hill Scheme, depending on queue lengths on diverge slip roads.	2	2	2	0	0	0	0	0	0	6	2	2	1	0	1	-1	1	-1	0		5	Deliverable in theory	Feasible in theory	✓	✓	✓	✓	✓	
21-A	Widening to 3 lanes, including replacement of Hollinside Road overbridge pier and alteration to the bridge revetment, if not covered by Lobley Hill Scheme	2	2	0	0	1	0	0	0	0	5	2	2	1	0	1	-1	1	-1	0		5	Deliverable but with challenges	Feasible but with challenges	✓	✓	✓	✓	✓	
21-D	3 narrow lanes within existing highway boundary and modification of bridge pier if not covered by Lobley Hill Scheme, subject to impact assessment of the pier.	2	2	0	0	1	0	0	0	0	5	2	2	2	0	1	-1	1	2	0		9	Deliverable in theory	Feasible but with challenges	✓	✓	✓	✓	✓	
22-B	Widening to 4 lanes and widening of Marconi Way Underbridge	2	2	0	0	2	0	0	0	0	6	2	2	1	0	1	-1	1	-1	0		5	Deliverable but with challenges	Not feasible / significant challenges	✓	✓	✓	✗	✗	Not feasible because its not required based on 2029 traffic demand flow (only 3 lanes are required in this section)
22-D	3 narrow lanes within existing highway boundary subject to closure of Swallwell slips	2	2	0	0	2	0	0	0	0	6	2	2	2	0	1	-1	1	2	0		9	Deliverable but with challenges	Feasible but with challenges	✓	✓	✓	✓	✓	
23-G	Closure of Swallwell slip roads	2	2	0	2	2	0	0	0	1	9	2	2	-2	0	2	-1	1	1	0		5	Deliverable but with challenges	Feasible but with challenges	✓	✓	✓	✓	✓	
23-W	Full Signalisation of Swallwell Junction, depending on queue lengths on diverge slip roads and if slip roads are not closed.	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	-1	1	0	1		4	Deliverable in theory	Not feasible / significant challenges	✗	✓	✓	✗	✗	Not feasible due to existing roundabout size too small to be effective as a signalised roundabout
23-X	Widening of northbound diverge slip road to 2 lanes depending on peak hour traffic flow and if the slip road is not closed.	0	0	0	0	0	0	0	0	0	0	1	1	1	0	1	-1	1	-1	0		3	Deliverable in theory	Feasible in theory	✗	✗	✓	✓	✗	
23-Y	Widening of northbound diverge slip road to 3 lanes at approach to stop/give way line, depending on queue lengths on diverge slip roads and if slip roads are not closed.	0	0	0	0	0	0	0	0	0	0	1	1	1	0	1	-1	1	-1	0		3	Deliverable in theory	Feasible in theory	✗	✗	✓	✓	✗	
24-A	Widening to 3 lanes, to include widening of Long Rigg Road, Swallwell Slip and River Derwent Underbridges.	2	2	0	0	2	0	0	0	0	6	2	2	1	0	1	-1	1	-1	0		5	Deliverable but with challenges	Feasible but with challenges	✓	✓	✓	✓	✓	
24-B	Widening to 4 lanes, to include widening of Long Rigg Road, Swallwell Slip and River Derwent Underbridges.	2	2	0	0	2	0	0	0	0	6	2	2	1	0	1	-1	1	-1	0		5	Deliverable but with challenges	Feasible but with challenges	✓	✓	✓	✓	✓	
24-D	3 narrow lanes within existing highway boundary Northbound only. Subject to closure of Swallwell Slip and provision of 2 narrow lanes on southbound.	2	1	0	0	2	0	0	0	0	5	2	2	2	0	1	-1	1	2	0		9	Deliverable but with challenges	Feasible but with challenges	✓	✓	✓	✓	✓	
24-F	Offline dualling to the west between Metro Centre and Derwenthaugh Junction	2	2	0	0	2	0	0	1	0	7	2	2	-2	0	2	1	1	-2	0		4	Very difficult to deliver	Not feasible / significant challenges	✓	✓	✗	✗	✗	Not deliverable/feasible due to lack of space, time scale and land availability.
24-J	Restrengthening of existing 3no underbridges (Long Rigg Road, Swallwell Slip and River Derwent) subject to loading assessment	2	2	0	0	2	0	0	1	0	7	2	2	1	1	1	-1	1	1	0		8	Deliverable in theory	Feasible in theory	✓	✓	✓	✓	✓	
24-K	Replacement of existing 3no underbridges (Long Rigg Road, Swallwell Slip and River Derwent) subject to loading assessment	2	2	0	0	2	0	0	1	0	7	2	2	-1	1	1	-1	1	-1	0		4	Deliverable but with challenges	Feasible but with challenges	✓	✓	✓	✓	✓	
25-W	Full Signalisation of Derwenthaugh Junction, depending on queue lengths on diverge slip roads.	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	-1	1	0	0		2	Deliverable in theory	Not feasible / significant challenges	✗	✗	✓	✗	✗	Not feasible due to existing roundabout size too small to be effective as a signalised roundabout
25-X	Widening of northbound diverge slip road to 2 lanes, depending on peak hour traffic flow on the slip road.	0	0	0	0	0	0	0	0	0	0	1	1	1	0	1	-1	1	-1	0		3	Deliverable in theory	Feasible in theory	✗	✗	✓	✓	✗	
25-Y	Extending existing 3 lanes on the diverge slip road approach to stop/give way line, depending on queue lengths on diverge slip roads.	0	0	0	0	0	0	0	0	0	0	1	1	1	0	1	-1	1	-1	0		3	Deliverable in theory	Feasible in theory	✗	✗	✓	✓	✗	
26-A	Widen to 3 lanes and widen 2 no. underbridges (A694 and Derwanthaugh slip road underbridges).	1	1	0	0	1	0	0	0	0	3	1	1	1	0	1	-1	1	-1	0		3	Deliverable but with challenges	Feasible but with challenges	✗	✗	✓	✓	✗	
26-J	Restrengthening of existing 2 no. underbridges (as per above) subject to loading assessment	1	1	0	0	1	0	0	1	0	4	1	1	2	1	1	-1	1	1	0		7	Deliverable but with challenges	Feasible but with challenges	✗	✓	✓	✓	✗	
26-K	Replacement of 2 no. underbridges (as per above). Subject to loading assessment.	1	1	0	0	1	0	0	1	0	4	1	1	-1	1	1	-1	1	-1	0		2	Deliverable but with challenges	Feasible but with challenges	✗	✗	✓	✓	✗	
27-A	Widen to 3 lanes including Blaydon Bridge, replace Scotswood slip overbridge piers and alterations to bridge revetments.	2	2	0	0	0	0	0	1	0	5	2	2	1	0	1	-1	1	-1	0		5	Deliverable but with challenges	Feasible but with challenges	✓	✓	✓	✓	✓	
27-F and 28- F	Offline dualling between Derwenthaugh and Scotswood with new bridge over several structure including River Tyne.	2	2	0	0	0	0	0	1	0	5	2	2	-2	0	1	1	1	-2	0		4	Very difficult to deliver	Not feasible / significant challenges	✓	✓	✗	✗	✗	Not deliverable/feasible due to lack of space, time scale and land availability.
27-J and 28-J	Restrengthening of Blaydon Bridge subject to loading assessment.	2	2	0	0	0	0	0	1	0	5	2	2	2	1	1	-1	1	1	0		9	Deliverable but with challenges	Feasible but with challenges	✓	✓	✓	✓	✓	
27-K and 28- K	Replacement of Blaydon Bridge. Subject to bridge costing assessment.	2	2	0	0	0	0	0	1	0	5	2	2	-1	1	1	-1	1	-1	0		4	Deliverable but with challenges	Feasible but with challenges	✓	✓	✓	✓	✓	
28- V	New low level crossing across River Tyne	1	1	0	0	0	0	0	0	1	3	1	1	0	2	1	1	1	-2	0		5	Very difficult to deliver	Not feasible / significant challenges	✗	✓	✗	✗	✗	Not deliverable/feasible due to lack of space, time scale and land availability.
29-G	Closure of Scotswood slip roads	2	2	1	2	0	0	0	0	1	8	2	2	-2	0	2	-1	1	1	0		5	Deliverable but with challenges	Feasible but with challenges	✓	✓	✓	✓	✓	
29-X	Widen southbound diverge slip road to 2 lanes	2	2	2	0	0	0	0	0	0	6	2	2	1	0	1	-1	1	-1	0		5	Deliverable in theory	Feasible in theory	✓	✓	✓	✓	✓	
29-Y	Extend 3 lanes on southbound approach to stop line	2	2	2	0	0	0	0	0	0	6	2	2	1	0	1	-1	1	-1	0		5	Deliverable in theory	Feasible in theory	✓	✓	✓	✓	✓	
30-B	Widen to 4 lanes, to include replacement of retaining wall and acquisition of residential land, as well as amendments to wood grove road, croppers lane and southway merge slip.	2	2	0	0	2	0	0	0	-1	5	2	2	1	0	2	-1	1	-2	0		5	Very difficult to deliver	Not feasible / significant challenges	✓	✓	✗	✗	✗	Not deliverable/feasible due to major physical constraints, time scale and land availability.
30-E	4 narrow lanes within existing highway boundary. Subject to provision of 3 narrow lanes on approximately 200m on section 27.	2	2	0	0	2	0	0	0	0	6	2	2	2	0	2	-1	1	2	0		10	Deliverable in theory	Feasible but with challenges	✓	✓	✓	✓	✓	
30- F	Offline dualling between Scotswood and Denton	2	2	0	0	2	0	0	1	0	7	2	2	-2	0	2	1	1	-2	0		4	Very difficult to deliver	Not feasible / significant challenges	✓	✓	✗	✗	✗	Not deliverable/feasible due to lack of space, time scale and land availability.

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See end of sheet for identified problems and objectives.
See Intervention Matrix (Sheet 2) for Intervention Codes.

Qualitative assessment against identified problems
- 2 Large beneficial impact
- 1 Beneficial impact
- 0 Neutral / marginal impact
- -1 Adverse impact
- -2 Large adverse impact

Qualitative assessment against identified objectives
- 2 Large beneficial impact
- 1 Beneficial impact
- 0 Neutral / marginal impact
- -1 Adverse impact
- -2 Large adverse impact

Deliverability (e.g. political, planning, timescale or third party issues)
- Deliverable in theory
- Deliverable but with challenges
- Very difficult to deliver

Feasibility (e.g. physical constraint, land availability and design standards)
- Feasible in theory
- Feasible but with challenges
- Not feasible / significant challenges

Initial Sifting Criteria
Each option must meet the following sifting criteria to be considered further within EAST:
1: Overall moderate impact against identified problems (Appraisal score >4, see East Conversion below)
2: Overall moderate fit with route objectives (Appraisal score >3, see East conversion below)
3: Must be deliverable in theory
4: Must be feasible in theory

Reference (Route Section-Intervention)	Option Description	Problems (EAST Scale of Impact)										Objectives (EAST Fit with Other Objectives)										Deliverability	Feasibility	Initial Sifting Criteria Prior to EAST				Take to EAST	
		1	2	3	4	5	6	7	8	9	Total	1	2	3	4	5	6	7	8	9	-	Total			1	2	3	4		
31-W	Full signalisation of Denton Island Junction	2	2	2	0	2	0	0	0	0	8	2	2	0	0	2	-1	1	0	1		7	Deliverable in theory	Feasible in theory	✓	✓	✓	✓	✓	
31-Y	Extend existing 3 lanes on northbound approach to stop line	2	2	2	0	2	0	0	0	-1	7	2	2	1	0	2	-1	1	-1	0		6	Deliverable but with challenges	Feasible but with challenges	✓	✓	✓	✓	✓	
32-A	Widen to 3 lanes, to include replacement of retaining structure supporting Denton Island and earthworks. Relocate footbridge piers on both sides.	2	0	0	0	1	0	0	0	0	5	2	2	1	0	1	-1	1	-1	0		5	Deliverable but with challenges	Not feasible / significant challenges	✓	✓	✓	✗	✗	Not feasible due to major physical constraints.
32-D	3 narrow lanes within existing highway boundary	2	2	0	0	1	0	0	0	0	5	2	2	2	0	1	-1	1	2	0		9	Deliverable in theory	Feasible but with challenges	✓	✓	✓	✓	✓	
33-B	Widen to 4 lanes, to include replacement of 2 no. footbridges and 4 no. overhead traffic signs gantries.	2	1	0	0	2	0	0	0	-1	4	2	2	1	0	2	-1	1	-1	0		6	Deliverable but with challenges	Feasible but with challenges	✗	✓	✓	✓	✗	
33-C	Widen to 5 lanes on northbound and 4 lanes on southbound, to include replacement of 2 no. footbridges and 4 no. overhead traffic signs gantries	2	2	0	0	2	0	0	0	-1	5	2	2	1	0	2	-1	1	-2	0		5	Deliverable but with challenges	Feasible but with challenges	✓	✓	✓	✓	✓	
33-E	4 narrow lanes within existing highway boundary	2	1	0	0	2	0	0	0	0	5	2	2	2	0	2	-1	1	2	0		10	Deliverable in theory	Feasible but with challenges	✓	✓	✓	✓	✓	
33- F	Offline dualling between Denton and Stamfordham Junction	2	2	0	0	2	0	0	1	0	7	2	2	-2	0	2	1	1	-2	0		4	Very difficult to deliver	Not feasible / significant challenges	✓	✓	✗	✗	✗	Not deliverable/feasible due to lack of space, time scale and land availability.
34-Y	Stamfordham Road Junction - Widening of existing diverge slip roads to 3 lanes at approach to stop line. Depending on queue lengths on diverge slip roads.	0	2	2	0	0	0	0	0	-1	3	2	2	1	0	1	-1	1	-1	0		5	Deliverable in theory	Feasible in theory	✗	✓	✓	✓	✗	
35-A	Widen to 3 lanes, to include replacement of retaining structure supporting Stamfordham Junction and earthworks. Relocate 2 no. footbridge piers on both sides of the road.	2	1	0	0	1	0	0	0	0	4	2	2	1	0	1	-1	1	-1	0		5	Deliverable but with challenges	Feasible but with challenges	✗	✓	✓	✓	✗	
35-B	Widen to 4 lanes on northbound and 3 lanes on southbound, to include replacement of retaining structure supporting Stamfordham Junction and earthworks. Relocate 2 no. footbridge piers on both sides of the road.	2	2	0	0	1	0	0	0	0	5	2	2	1	0	1	-1	1	-1	0		5	Deliverable but with challenges	Feasible but with challenges	✓	✓	✓	✓	✓	
35-D	3 narrow lanes within existing highway boundary	2	2	0	0	1	0	0	0	0	5	2	2	2	0	1	-1	1	2	0		9	Deliverable in theory	Feasible but with challenges	✓	✓	✓	✓	✓	
36-B	Widen to 4 lanes, replace 4 no. overhead signal gantries. Relocate piers on Etal Lane overbridge and alterations to revetment on both sides	2	2	0	0	2	0	0	0	-1	5	2	2	1	0	2	-1	1	-1	0		6	Deliverable but with challenges	Feasible but with challenges	✓	✓	✓	✓	✓	
36-E	4 narrow lanes within existing highway boundary	2	2	0	0	2	0	0	0	0	6	2	2	2	0	2	-1	1	2	0		10	Deliverable in theory	Feasible but with challenges	✓	✓	✓	✓	✓	
36-F	Offline dualling from Stamfordham Road to Ponteland Road Junction	2	2	0	0	2	0	0	1	0	7	2	2	-2	0	2	1	1	-2	0		4	Very difficult to deliver	Not feasible / significant challenges	✓	✓	✗	✗	✗	Not deliverable/feasible due to lack of space, time scale and land availability.
37-W	Full signalistion of Ponteland Road Junction.	0	2	2	0	0	0	0	0	0	4	2	2	0	0	1	-1	1	0	1		6	Deliverable in theory	Feasible in theory	✗	✓	✓	✓	✗	
37-Y	Ponteland Road Junction - Widening of A1 southbound diverge slip roads to 3 lanes at approach to give way line. Depending on queue lengths on diverge slip roads.	0	2	2	0	0	0	0	0	0	4	2	2	1	0	1	-1	1	-1	0		5	Deliverable in theory	Feasible in theory	✗	✓	✓	✓	✗	
38-A	Widen to 3 lanes, to include replacement of 2no. overbridge abutments (Ponteland Road Junction).	2	2	0	0	1	0	0	0	0	5	2	2	1	0	1	-1	1	-1	0		5	Deliverable but with challenges	Feasible but with challenges	✓	✓	✓	✓	✓	
38-D	3 narrow lanes within existing highway boundary	2	2	0	0	1	0	0	0	0	5	2	2	2	0	1	-1	1	2	0		9	Deliverable in theory	Feasible but with challenges	✓	✓	✓	✓	✓	
39-A	Widen to 3 lanes, including replacement of 2 no. footbridges and alterations to abutments under railway bridge.	2	1	0	0	2	0	0	0	-1	4	2	2	1	0	2	-1	1	-1	0		6	Deliverable but with challenges	Feasible but with challenges	✗	✓	✓	✓	✗	
39-B	Widen to 4 lanes, including replacement of 2 no. footbridges and alterations to abutments under railway bridge.	2	2	0	0	2	0	0	0	-1	5	2	2	1	0	2	-1	1	-1	0		6	Deliverable but with challenges	Feasible but with challenges	✓	✓	✓	✓	✓	
39-D	3 narrow lanes within existing highway boundary	2	1	0	0	2	0	0	0	0	5	2	2	2	0	2	-1	1	2	0		10	Deliverable in theory	Feasible but with challenges	✓	✓	✓	✓	✓	
39-F	Offline dualling from Ponteland Road to Kingston Park Junction	2	2	0	0	2	0	0	1	0	7	2	2	-2	0	2	1	1	-2	0		4	Very difficult to deliver	Not feasible / significant challenges	✓	✓	✗	✗	✗	Not deliverable/feasible due to lack of space, time scale and land availability.
40-W	Full signalisation of Kingston Park Junction.	0	2	2	0	0	0	0	0	0	4	2	2	0	0	1	-1	1	0	1		6	Deliverable in theory	Feasible in theory	✗	✓	✓	✓	✗	
40-Y	Kingston Park Junction - Widening of A1 northbound and southbound diverge slip roads to 3 lanes at approach to stop/give way line.	0	2	2	0	0	0	0	0	0	4	2	2	1	0	1	-1	1	-1	0		5	Deliverable in theory	Feasible in theory	✗	✓	✓	✓	✗	
41-A	Widen to 3 lanes, to include replacement of 2no. overbridge abutments (Kingston Park Junction).	2	2	0	0	1	0	0	0	0	5	2	2	1	0	1	-1	1	-1	0		5	Deliverable but with challenges	Feasible but with challenges	✓	✓	✓	✓	✓	
41-D	3 narrow lanes within existing highway boundary	2	2	0	0	1	0	0	0	0	5	2	2	2	0	1	-1	1	2	0		9	Deliverable in theory	Feasible but with challenges	✓	✓	✓	✓	✓	
42-A	Widen to 3 lanes and widen Ouse Burn culvert.	2	2	0	0	2	0	0	0	-1	5	2	2	1	0	2	-1	1	-1	0		6	Deliverable in theory	Feasible but with challenges	✓	✓	✓	✓	✓	
42-D	3 narrow lanes within existing highway boundary from end of section 41 to ouse burn culvert (approx 200m) and widen to 3 full lanes from end of ouse burn culvert to end of section 42.	2	2	0	0	2	0	0	0	0	6	2	2	2	0	1	-1	1	2	0		9	Deliverable in theory	Feasible but with challenges	✓	✓	✓	✓	✓	
42-F	Offline dualling from Kingston Park to North Brunton Junction	2	2	0	0	2	0	0	1	0	7	2	2	-2	0	2	1	1	-2	0		4	Deliverable but with challenges	Not feasible / significant challenges	✓	✓	✓	✗	✗	Not feasible due to physical constraints (Brunton lane) and land availability.
42-J	Restrengthening of existing Ouse Burn culvert subject to loading assessment	2	2	0	0	2	0	0	1	0	7	2	2	2	1	1	-1	1	1	0		9	Deliverable in theory	Feasible in theory	✓	✓	✓	✓	✓	
42-K	Replacement of Ouse Burn culvert. Subject to loading assessment.	2	2	0	0	2	0	0	1	0	7	2	2	-1	1	1	-1	1	-1	0		4	Deliverable but with challenges	Feasible in theory	✓	✓	✓	✓	✓	
43-Y	North Brunton Junction - Widening of A1 northbound diverge slip roads to 3 lanes at approach to stop line on nearside and offside. Extend A1 southbound diverge slip roads to 3 lanes at approach to stop line. Depending on queue lengths on diverge slip roads.	1	2	2	0	0	0	0	0	0	5	2	2	1	0	1	-1	1	-1	0		5	Deliverable in theory	Feasible but with challenges	✓	✓	✓	✓	✓	
44-A	Widen to 3 lanes and widen 2 no. underbridges (North Brunton Junction).	1	1	0	0	1	0	0	0	0	3	1	1	1	0	1	-1	1	-1	0		3	Deliverable but with challenges	Feasible but with challenges	✗	✗	✓	✓	✗	
44-J	Restrengthening of existing 2 no. underbridges (North Brunton Junction) subject to loading assessment	1	1	0	0	1	0	0	1	0	4	1	1	2	1	1	-1	1	1	0		5	Deliverable but with challenges	Feasible but with challenges	✗	✓	✓	✓	✗	
44-K	Replacement of 2 no. underbridges (North Brunton Junction). Subject to loading assessment	1	1	0	0	1	0	0	1	0	4	1	1	-1	1	1	-1	1	-1	0		2	Deliverable but with challenges	Feasible but with challenges	✗	✗	✓	✓	✗	
45- A	Widen to 3 lanes	0	2	0	0	0	0	0	0	-1	1	2	2	1	0	1	-1	1	-1	0		5	Deliverable but with challenges	Feasible but with challenges	✗	✓	✓	✓	✗	
45-F	Offline dualling from North Brunton to Seaton Burn Junction	0	2	0	0	0	0	0	0	0	2	2	2	-2	0	1	1	1	-2	0		4	Very difficult to deliver	Not feasible / significant challenges	✗	✓	✗	✗	✗	Not deliverable/feasible due to lack of space, time scale and land availability.
45-J	Restrengthening of existing 2 no. underbridges (Darrell Street and Coach Lane) and 2 no. culverts subject to loading assessment	0	2	0	0	0	0	0	1	0	3	1	1	2	1	1	-1	1	1	0		5	Deliverable but with challenges	Feasible but with challenges	✗	✓	✓	✓	✗	
45-K	Replacement of existing 2 no. underbridges (Darrell Street and Coach Lane) and 2 no. culverts subject to loading assessment	0	2	0	0	0	0	0	1	0	3	1	1	-1	1	1	-1	1	-1	0		2	Deliverable but with challenges	Feasible but with challenges	✗	✗	✓	✓	✗	
46-Y	Widening of northbound and southbound diverge slip roads to 3 lanes at approach to stop/ give way line. If not covered by Seaton Burn Pinch Point Scheme.	2	2	2	0	0	0	0	0	0	6	2	2	1	0	1	-1	1	-1	0		5	Deliverable in theory	Feasible in theory	✓	✓	✓	✓	✓	
Packages of Options																														
14/17/21/24/32/38/41/42/45-A, 15/30/35/36/39-B, 33-C and 23-G	Widening mainline carriageway to standard lane width and required number of lanes based on forecasted 2029 traffic flow demand (between Birtley Bifurcation and Seaton Burn - excluding River Tyne Blaydon Bridge). Including closure of Swalwell Slips.	2	2	0	1	2	0	0	0	-2	5	2	2	1	0	2	-1	1	-1	0		6	Very difficult to deliver	Not feasible / significant challenges	✓	✓	✗	✗	✗	Not deliverable/feasible due to physical constraints, time scale and land availability.
14/15/17/21/22/35/38/39/41/42-D, 30/33/36-E, 45-A and 23-G	Narrow lanes within existing highway boundary. Including widening to standard lane widths where there are no major structures and closure of Swalwell Slips. Between between Birtley Bifurcation and Seaton Burn, excluding River Tyne Blaydon Bridge.	2	2	0	1	2	0	0	0	0	7	2	2	2	0	2	-1	1	1	0		9	Deliverable but with challenges	Feasible but with challenges	✓	✓	✓	✓	✓	

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See end of sheet for identified problems and objectives.
See Intervention Matrix (Sheet 2) for Intervention Codes.

Qualitative assessment against identified problems

2	Large beneficial impact
1	Beneficial impact
0	Neutral / marginal impact
-1	Adverse impact
-2	Large adverse impact

Qualitative assessment against identified objectives

2	Large beneficial impact
1	Beneficial impact
0	Neutral / marginal impact
-1	Adverse impact
-2	Large adverse impact

Deliverability
(e.g. political, planning, timescale or third party issues)

- Deliverable in theory
- Deliverable but with challenges
- Very difficult to deliver

Feasibility
(e.g. physical constraint, land availability and design standards)

- Feasible in theory
- Feasible but with challenges
- Not feasible / significant challenges

Initial Sifting Criteria
Each option must meet the following sifting criteria to be considered further within EAST:

1. Overall moderate impact against identified problems (Appraisal score >4, see East Conversion below)
2. Overall moderate fit with route objectives (Appraisal score >3, see East conversion below)
3. Must be deliverable in theory
4. Must be feasible in theory

Reference (Route Section-Intervention)	Option Description	Problems (EAST Scale of Impact)										Objectives (EAST Fit with Other Objectives)										Deliverability	Feasibility	Initial Sifting Criteria Prior to EAST				Take to EAST	
		1	2	3	4	5	6	7	8	9	Total	1	2	3	4	5	6	7	8	9	-	Total			1	2	3	4	
5/11/14/17/21/24/32/38/41/42/45-A, 6/8/9/11/15/30/35/36/39-B, 33-C and 9/23-G	Widening mainline carriageway to standard lane width and required number of lanes based on forecasted 2029 traffic flow demand (between Birtley Bifurcation and Seaton Burn - excluding River Tyne Blaydon Bridge), and based on assumed requirements to address the issues identified in stage 1 report (between Carville and Birtley Bifurcation). Including closure of Swalwell Slips and Washington services.	-2	-2	0	1	2	0	0	0	-2	5	2	2	1	0	2	-1	1	-1	0		6	Very difficult to deliver	Not feasible / significant challenges	✓	✓	✗	✗	✗	Not deliverable/feasible due to physical constraints, time scale and land availability.
5/11/14/15/17/21/22/35/38/39/41/42-D, 30/33/36-E, 45-A, 6-Z and 23-G	Narrow lanes, discontinuos hardshoulder and hardshoulder running within existing highway boundary. Including widening to standard lane widths where there are no major structures and closure of Swalwell Slips. Between Carville and Seaton Burn, excluding River Tyne Blaydon Bridge.	-2	-2	0	1	2	0	0	0	0	7	2	2	2	0	2	-1	1	1	0		7	Deliverable but with challenges	Feasible but with challenges	✓	✓	✓	✓	✓	
1/4/10/13/16/20/25/29/31/34/37/40/43/46-Y, 7/10/13/20/25-X, 13/16/31/37/40-W and 23-G	Junction improvements and closure of Swalwell Slips	2	2	2	0	1	0	0	0	-1	6	2	2	1	0	1	-1	1	1	1		5	Deliverable but with challenges	Feasible but with challenges	✓	✓	✓	✓	✓	
14 to 46-F	New Bypass to the West of Existing Bypass between Birtley Bifurcation and Seaton Burn	2	2	2	2	1	0	0	2	-2	9	2	2	-2	0	2	1	1	-2	0		4	Very difficult to deliver	Not feasible / significant challenges	✓	✓	✗	✗	✗	Not deliverable/feasible due to lack of space, time scale and land availability.
2/3/5/6/8/9/11/12/14/15/17/21/22/24/26/27/30/32/33/35/36/38/39/41/42/44/45-O,P,R&S	Technology Scheme (VMS, CCTV, MIDAS and Lane Signals) on mainline between Junction 62 and Seaton Burn.	1	1	0	0	1	1	2	0	0	6	1	1	0	2	2	-2	1	0	0		5	Deliverable but with challenges	Feasible but with challenges	✓	✓	✓	✓	✓	
12/14/15/17/21/22/24/26/27/30/32/33/35/36/38/39/41/42/44/45-N	Average speed cameras on mainline between Birtley Bifurcation and Seaton Burn	1	1	0	1	2	0	0	0	0	5	1	1	0	2	2	-2	1	0	0		5	Deliverable but with challenges	Feasible but with challenges	✓	✓	✓	✓	✓	
26/27/30/32/33/35/36/38/39/41/42/44/45-L	Reduce speed limit to 50mph on mainline between Darwenthaugh and Seaton Burn	1	1	0	1	2	0	0	0	0	5	1	1	0	2	2	-1	1	0	0		6	Deliverable in theory	Feasible but with challenges	✓	✓	✓	✓	✓	
12/15/22/24/27/30/33/36/39/42/45-M	Lay-bys on mainline between Birtley Bifurcation and Seaton Burn	1	1	0	0	2	2	0	0	0	6	1	1	0	2	2	-2	1	-1	2		6	Deliverable but with challenges	Feasible but with challenges	✓	✓	✓	✓	✓	
2/3/5/6/8/9/11/12/14/15/17/21/22/24/26/27/30/32/33/35/36/38/39/41/42/44/45-T	Observation points on mainline between Junction 62 and Seaton Burn.	1	1	0	0	2	1	0	0	0	5	1	1	0	2	1	-1	1	-1	0		4	Deliverable but with challenges	Feasible but with challenges	✓	✓	✓	✓	✓	
2/3/5/6/8/9/11/12/14/15/17/21/22/24/26/27/30/32/33/35/36/38/39/41/42/44/45-Q	ERT on mainline between Junction 62 and Seaton Burn.	0	0	0	0	1	2	2	0	0	5	0	0	0	2	2	-1	0	0	2		5	Deliverable but with challenges	Feasible but with challenges	✓	✓	✓	✓	✓	
2/3/5/6/8/9/11/12/14/15/17/21/22/24/26/27/30/32/33/35/36/38/39/41/42/44/45-U	Marker posts on mainline between Junction 62 and Seaton Burn.	0	0	0	0	1	2	2	0	0	5	0	0	0	2	2	-1	0	0	2		5	Deliverable in theory	Feasible in theory	✓	✓	✓	✓	✓	
1 to 46-H	Pavement restrengthening subject to investigation on mainline and junctions between Junction 62 and Seaton Burn	0	0	0	0	1	0	0	2	1	4	0	2	2	2	1	-1	1	2	0		9	Deliverable but with challenges	Feasible but with challenges	✗	✓	✓	✓	✗	
1 to 46-I	Earthworks restrengthening subject to investigation on mainline and junctions between Junction 62 and Seaton Burn	0	0	0	0	1	0	0	2	0	3	0	2	2	2	1	-1	1	2	0		9	Deliverable but with challenges	Feasible but with challenges	✗	✓	✓	✓	✗	

Identified Problems

1 Current traffic congestion - increased journey times/low traffic speeds on the section.
2 Future traffic congestion - will be increased journey times/low traffic speeds on the section.
3 Poor/low capacity junction standard/layout.
4 Difficult merge/diverge between junctions leads to traffic congestion/accidents.
5 Safety - relatively high accidents/incidents for vehicle occupants.
6 Safety - relatively high accidents/incidents for NMUs.
7 Lack of information for drivers
8 Poor carriageway quality
9 Traffic noise/poor air quality

Route Objectives

1 Reduce congestion and improve journey times on this route of local, regional and strategic importance.
2 Improve network resilience and journey time reliability on this route of local, regional and strategic importance.
3 Make best use of existing road infrastructure.
4 Assist on-going maintenance requirements and meet the needs of the Highways Agency's Network Delivery and Development.
5 Improve safety for road users, including pedestrians and cyclists.
6 Maintain access for local traffic whilst improving the conditions for regional and strategic traffic.
7 Facilitate local regeneration and development plans.
8 Mitigate potential impacts upon the built and natural environment.
9 Provide appropriate accessibility and severance mitigation for non-motorised users.

East Conversion
Problems (Scale of Impact)

Appraisal Score	East Rating
≤0	Very small impact
1	Minor Impact
2	
3	
4	
5	Moderate Impact
6	
7	
8	
9	Significant impact
10	
11	
12	
13	Fully addresses identified problems
14	
15	
16	

Objectives (Fit with Other Objectives)

Appraisal Score	Rating
≤0	Very small impact
1	Minor impact
2	
3	
4	Moderate Impact
5	
6	
7	Significant Impact
8	
9	
10	Fully Addresses Objectives
11	
12	

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Appendix B

Local Schemes – Technical Note provided by Newcastle City Council

Information for the Highways Agency on Transport Schemes in the North East

Schemes that support the HA works on the A1

The North East SEP's proposals for focused investment on both the A1 Western Bypass and A19 corridors will complement the schemes already developed by the Highways Agency which aim to reduce congestion and increase capacity on these routes. On the A1 Western Bypass three lanes along as much of the route as possible, as soon as possible, would be welcomed. The SEP also recognises that the need for renewal of Allerdene Bridge is becoming an increasingly high priority. These infrastructure works will be complemented by a range of LSTF measures to reduce the large number of short trips which presently use these routes. The LSTF capital package will complement LSTF revenue bids for Durham, Northumberland and Tyne and Wear.

Initial SEP proposals contain focused investment for both the A1 and A19 corridors, with packages designed to complement existing investment such as the current A1 Western Bypass Lobley Hill scheme, and to facilitate improvements to important trunk road junctions, such as the A19 at Testos and Silverlink.

The SEP contains a number of schemes that aim to enhance the movement of traffic on both local roads and the wider trunk road network. These schemes are:

- A1 Scotswood Bridgehead (Full approval, LGF 2015/16)
- Weetslade Junction (Full approval, LGF 2015/16)
- A167 Park and Ride corridor (Full approval. LGF 2015/16 - Local Major Scheme)
- A1058 Strategic Corridor Improvement (Coast Road) (Full approval - LGF 2015/16 - Local Major Scheme)
- Newcastle Northern Access Corridor (Phase 1) (Full approval - LGF 2015/16 - Local Major Scheme)
- Lindisfarne Roundabout (Full approval – LGF 2015/16)
- A194/A185 'The Arches' junction (Provisional funding – LGF 2016/17)
- Northern Access Corridor (Phase 2), Osborne Road- Haddricks Mill (Full approval, LGF 2015/16)
- Coach Lane and Tyne View Park (A191 junctions) (Full approval, LGF 2015/16)
- A19 employment corridor access improvements (A191 to Silverlink North) (Full approval, LGF 2015/16)
- A1/A19 Local Junctions Improvement Package (Provisional funding, LGF 2016/17)

The above schemes will receive a funding contribution from the Local Growth Fund.

A1 Scotswood Bridgehead – Total cost £4.20m (Full approval, LGF 2015/16) Improvements will ensure access over this crucial river crossing bridge for all modes to the employment, education and retail opportunities on both sides of the river Tyne. This scheme will support the development of Metro Green in Gateshead (850 new homes and 15000sqm of office accommodation) and the Scotswood Masterplan site (1300 new homes). It will also benefit from being upgraded to support traffic from housing

developments in the west of Newcastle. including:- Callerton (approx 3000 homes); Dinnington (approx 250 homes); Newcastle Great Park (up to 1200 homes); and Newcastle International Airport (50ha development site).

Scheme will commence in 2015/16.

Weetslade Junction - Total cost £4.80m (Full approval, LGF 2015/16) Improvements to flows in the A188/A189 corridor and linkages to future employment development at Weetslade and existing employment sites in

Killingworth. Facilitates Indigo Park an 82 acre strategic employment site with the potential for 1000 new jobs.

The Weetslade Junction scheme will commence in 2015/16 and is expected to complete 2018/19.

A167 Park and Ride corridor – total cost £7.46m (local major scheme, Full approval, LGF 2015/16)

The scheme consists of two main elements:

- construction of a 450 space park and ride site at Eighton Lodge, with potential for eventual expansion to 900 spaces; and
- Enhanced bus priority on Durham Road between the site and the urban core of Gateshead/Newcastle.

Bus priority elements of the proposals are already committed using LTP funding. The scheme for the construction of the park and ride site at Eighton Lodge is included in the SEP.

The key objective is to reduce traffic on routes to/from central urban area, thereby reducing congestion, supporting economic growth and reducing carbon emissions and other pollutants.

This scheme will begin in 2015/16.

A1058 Strategic Corridor Improvement (Coast Road) – Total cost £8.70m (Local major scheme, Full approval, LGF 2015/16)

The scheme will contribute to economic growth by delivering specific benefits for public transport on the A1058 Coast Road; improving general traffic flows on this strategic corridor linking North Tyneside and Newcastle; support growth in the corridor including facilitating the development of West Chirton Industrial Estate adjacent to the Coast Road.

This scheme will begin in 2015/16.

Newcastle Northern Access Corridor (Phase 1)- total cost £8.10m (Local major scheme, Full approval, LGF 2015/16)

The scheme provides improvements at two junctions that are linked in traffic flow.

The junctions: Bluehouse and Cowgate roundabouts, form part of a corridor package of works that link traffic movements from east – west and north – south in the north of Newcastle. The scheme will signalise the roundabouts and upgrade the junctions to reduce levels of congestion for all road users and address issues of severance for non-motorised

modes. This will be greatly assisted by the creation of a SCOOT area which is monitored and controlled by an upgraded UTC server.

The scheme will begin in 2015/16.

Lindisfarne Roundabout – total cost £4m (Full approval – LGF 2015/16)

South Tyneside Council are intending to undertake a carriageway improvement scheme that will improve traffic movements at Lindisfarne Roundabout thus providing improved connectivity (economic growth opportunities) to the Port of Tyne and South Shields town centre. South Tyneside Council will also deliver localised improvements to the A1300/A194 roundabout, as well as improving access to the Strategic Highway Network.

This scheme is scheduled to start in 2015/16.

A194/A185 'The Arches' junction – Total cost £6.70m (Provisional funding – LGF 2016/17)

The gyratory improvement scheme will improve traffic movements along A185/A194/A19 thus providing improved connectivity (economic growth opportunities) to the Strategic Highway Network, Port of Tyne and Bede Industrial estate, as well as key access into South Shields Town Centre.

This scheme is due to begin in 2016/17.

Northern Access Corridor (Phase 2), Osborne Road- Haddricks Mill – Total cost £4.93m (Full approval, LGF 2015/16)

This scheme builds upon the 'Northern Access Corridor' improvement scheme. The Haddricks Mill junction is located approximately 2km to the north of Newcastle City Centre close to the Newcastle/North Tyneside district boundary. The junction is a major pinch point on the boundary of several major employment sites, including the large employment site at Benton Park View (home of HMRC and DWP) the Freeman Hospital and Quorum Business Park. It is proposed to remove the existing mini roundabout junctions and provide a roundabout with a larger circulatory. This will be signalised and will incorporate the full signalisation of secondary junctions.

This scheme is planned to start 2015/16.

Coach Lane and Tyne View Park (A191 junctions) – Total cost £1.50m (Full approval, LGF 2015/16)

Improved access to Tyne View Park employment site and improved flows in A191 corridor. The Tyne View Park junction currently operates at 124% of capacity in the AM peak and 121% in the PM peak The planned improvements to flows will have benefits for the wider A19 corridor.

The scheme will commence in 2015/16

A19 employment corridor access improvements (A191 to Silverlink North) – Totalcost £4.70m (Full approval, LGF 2015/16)

Improvement to the A191 and Silverlink North junction facilitates economic development in the A19 corridor including the occupation of the remaining units at Cobalt Business Park (former Enterprise Zone site), a regionally significant location for skilled employment. It will address capacity issues in the area (the roundabout of A191 and The Silverlink North

currently operates at 94% of capacity in the AM peak): significant additional traffic is expected from committed development as remaining units on the business park are occupied.

The scheme will commence in 2015/16.

A1/A19 Local Junctions Improvement Package (Provisional funding, LGF 2016/17) Programme of A1/A19 junction improvements on the local authority road network (Improvements to the southern portal of the Tyne Tunnel, A19/A189 Seaham/Murton Interchange, A1/A690 Junction Improvements). Both the A1 and A19 corridors have been identified within the SEP as important arteries for the growth of the area. There are currently a number of investigations underway via the Highways Agency in to improvements on the Trunk Road network. Most notably for the Silverlink and Testos junctions and the A1 Western Bypass. This programme demonstrates a continued commitment to local authority investment in the local connections to the Trunk Road network, building upon the investment planned for the 15/16 period.

- A1/A690 junction improvements – total cost £2m

The scheme relates to Phase 2 of the redevelopment of the former LG Philips Factory, Belmont Industrial Estate, Durham. Phase 1 of the scheme, comprising 10 No. office blocks (Use Class B1) and ancillary café has now been completed. The planning approvals require improvements to the local highway network and J.62 of the A1(M) to be undertaken prior to the occupation of certain phases of the development and these requirements have ensured that the redevelopment of the site has stalled. The junction improvement works to J.62 of the A1(M) relate to the amendment to lane allocation to allow traffic to turn right from the near-side lane of the A1(M) southbound off-slip and the provision of advance map signage indicating the lane allocation on this approach.
This scheme is due to start 2018/19.

- A19/A189 Seaham / Murton Interchange - total cost £4.70m

At present, the existing junctions where the A182 meets the A19(T) operates within acceptable conditions, however a key council owned development plot to the west of the junction has been unable to be developed due to the inability for the existing junction to cater for the predicted demands. There are two primary reasons that require changes to this junction:

1) Adjacent land/sites are earmarked for development; and
2) The East Durham Link Road on the western arm of the junction will increase through traffic moving between the trunk road network and the employment zones in Durham.

The development zone to the west of the junction, Hawthorn Business Park, is of a size whereby the existing A182/A19(T) junction cannot sustain the additional traffic growth.

The full junction will be signalised with specific changes made to the eastern and western roundabouts.

This scheme is planned to commence 2019/20.

- Improvements to the southern portal of the Tyne Tunnel – total cost £4.50m

TT2 are reporting delays at the Southern Portal of the New Tyne Crossing which is causing South Bound traffic to tail back into the Tunnel. This is a significant health and safety concern and needs addressed at the earliest opportunity.

South Tyneside working in partnership with TT2 is proposing to undertake an appraisal of the local road network at the Southern Portal to determine the scope of improvements required to address the congestion within the actual New Tyne Crossing.

Further to these proposals, South Tyneside Council intends to appraise the option of dualling the A185 from the Tunnel Entrance to the Jarrow Slake entrance which will tie into the Arches Major Scheme proposals.

The scheme is planned to commence 2018/19

- Boldon Business Park Corridor Access – total cost £4.50m

The Highways Agency are preparing Major Scheme Enhancements to Testo's Roundabout which will be a £100million investment to relieve one of the borough's major bottleneck roundabouts. The development of the Testo's Roundabout scheme will be a substantial economic growth enabler for South Tyneside bearing in mind the close proximity to the Nissan Manufacturing Plant and the recently announced International Advanced Manufacturing Park (16ha) on the land to the North of Nissan.

South Tyneside Council considers that the following major scheme improvements can be pursued to address the congestion concerns to ensure that the congestion problems associated with Testo's roundabout are not transferred to the localised network:-

- Dualling of the A184 approaches to the Testo's Roundabout from the junction with Abingdon Way and A19 junction, this will require the regrading of the carriageway to enable increased journey time savings;
- A184 / Abingdon Way Roundabout – re-grading / realignment to enable direct access onto A194 approaching Testo's roundabout;
- Significant Improvements to the Boldon ASDA, New Road, North Road, Cotswold Lane, Henley Way junction, with land close to the Boldon North Road Social Club being utilised for major carriageway improvements and the re-prioritisation of the highway layouts. This will include the development of a traffic signalised roundabout which will be fitted with the latest technology, such as UTC, MOVA and CCTV linked to the UTMC facility;
- Further requirements to develop a public transport interchange / access improvements at the Boldon ASDA location
- CCTV traffic signal improvements at existing traffic signalised junctions including Abingdon Way / Henley Way, North Road / New Road, with further investigations to traffic signal improvements at Testo's roundabout (separate from Major Scheme proposals)
- Sustainable transport improvements throughout the corridor.

These high level improvements would significantly improve the movement of traffic on the localised approaches to Testo's Roundabout. This in turn would provide improved connectivity to the Strategic Highway Network, Port of Tyne and Boldon Business Parks as well as accessing the Nissan Manufacturing Plant and the future International Advanced Manufacturing plant.

This scheme is due to commence 2016/17

- Improvements to access from the A19 to the north bank of the Tyne (Swans site and Port of Tyne land) – total cost £4.70m

The main point of access from the strategic road network to the Enterprise Zone sites on the North Bank of the Tyne is the A19-A193 Howdon interchange. This connects to the A187, the main road which serves both the Port of Tyne to the east of the A19 and various sites along the River Tyne North Bank, including the Swans site, to the west of the A19. The A193, which runs parallel to the A187 and links Wallsend and North Shields, is also part of the local highway network which provides access from the local area.

The growth in employment will result in increased travel demand in the corridor for both private vehicles and freight, and hence an increase the number of vehicle movements along the corridor. Targeted improvements at key junctions along the corridor will minimise the risk of congestion which might otherwise affect journey times for work journeys and deliveries.

This scheme is due to commence 2016/17

There are a number of schemes in the Strategic Economic Plan which focus on traffic movement across the local network. These are:

- Sunderland Strategic Transport Corridor
- Durham Western Relief Road
- Sunderland Low Carbon Zone

Sunderland Strategic Transport Corridor – Total cost £45m (Provisional funding, LGF 2016/17)

This provision of a major new transport link supports the development of a number of key sites in the river Wear corridor, the regeneration of Sunderland Urban Core – City Centre and the regeneration of the Port of Sunderland. The scheme supports the introduction of the new Wear crossing announced as part of the Sunderland and South Tyneside city deal.

The scheme is expected to start in 2016/17

Durham Western Relief Road – Total £37.02m (Provisional funding, LGF 2016/17)

The County Durham Plan (CDP) recognises that the relief road is required for the delivery of new housing (the CDP proposes land for 5,000 new homes up to 2030) and employment in the city (a new business park at Aykley Heads alone could attract 6,000 new jobs over the plan period). Traffic in the city centre will be relieved at peak times, making existing and new employment hubs more attractive to businesses. Motorists, public transport users and cyclists will benefit from reduced journey times. The scheme will make the city a more attractive place for businesses to invest and for people to live and shop at, reducing the traffic impact on the historic core.

The scheme will begin in 2016/17.

Sunderland Low Carbon Zone – Total cost £13.50m (Local major scheme, Full approval, LGF 2015/16)

Improvements in transport infrastructure to the Low Carbon Zone, including the Enterprise Zone site – includes A19 / A1231 and A19 / A1290 junctions, internal road links, pedestrian, cycling and public transport facilities. The scheme aims to enhance the capacity of the network to accommodate projected employment growth of the entire zone

bounded by the A1231, A19, A1290 and Leamside Line, including Nissan, Enterprise Zone and other proposed developments.

Modal Shift

There are several schemes in the SEP that aim to encourage modal shift. These are:

- Central Metro Station Refurbishment
- Horden Rail Station
- South Shields Transport Hub
- Metro Enhancements
- LSTF Capital package of works

Central Metro Station Refurbishment – Total cost £7.88m (Full approval, LGF 2015/16)

Central Metro station is based in the centre of Newcastle and is a key transport interchange between Metro and heavy rail as well as providing connections to local bus services for the region. This scheme proposes the complete refurbishment of the station concourse and platforms in a style in keeping with the recently refurbished Haymarket Metro station.

The Central Metro Station Refurbishment scheme will start in 2015/16.

Horden Rail Station – Total cost £7.13m (Local major scheme, Full approval, LGF 2015/16)

The scheme proposes the construction of a new two platform station at Horden Sea View on the Durham Coast Line between Hartlepool and Sunderland that will be served by the existing hourly Northern Franchise service. It will create an economically and environmentally sustainable solution to some of the access constraints of East Durham.

This scheme will begin in 2015/16.

South Shields Transport Hub – Total cost £13.6m (Local major scheme, Full approval, LGF 2015/16)

The scheme will consolidate Metro and bus terminals in the heart of South Shields. This will provide a focal point for the transport network to create a step-change in quality. There are two main elements of the scheme: an expanded South Shields Metro Station, and a new South Shields Bus Station. This integrated transport interchange is a pivotal element of South Tyneside Council's broader vision for the regeneration of South Shields town centre – South Shields 365.

The scheme will begin in 2015/16.

Metro Enhancements – Total cost £8m (Provisional funding, LGF 2016/17)

The overriding objectives of the Metro Strategy 2030 are to replace the fleet of Metrocars and extend the reach of Metro beyond its current sphere of operation and the boundaries of Tyne and Wear. Work needs to commence in the medium term to plan for the design and procurement of the replacement fleet and Heaton traction shed has been identified as having strategic importance not just for this ambitious plan but to also provide land options at the existing South Gosforth sites, as well as providing access to Network Rail infrastructure. This is hugely attractive given the potential for both rail devolution and the potential to deploy heavy rail plant and machinery onto the Metro

infrastructure for renewals/maintenance activities. There is also scope for the establishment of a rail training facility at this location in order to supplement existing arrangements for Metro as well as offering the possibility to work with in partnership with other training providers within the rail industry.

This scheme is due to start 2016/17.

LSTF Capital package of works – Total cost £7.52m (Full approval, 2015/16)

As part of the North East Local Enterprise Partnership's firm commitment to sustainable travel and in recognition of the contribution it can make to congestion reduction, a healthier population and a more sustainable economy we have included a discrete capital allocation for sustainable transport measures that contribute to the economic objectives of the Strategic Economic Plan. These measures are intended to complement the Local Sustainable Transport Fund Revenue bids prepared by Durham, Northumberland and Tyne and Wear and submitted to Department for

Transport and will be delivered in the financial year 2015/16.

The capital package is made up of four components;

- UTMC
- Gateway improvements
- Cycling schemes
- Green Light to Work (scooters scheme

It was recently announced that, as part of the North East Growth Deal, government will invest £7.5m in the north east LSTF capital package of works.

Urban Traffic Management and Control

A series of improvements are planned to the UTMC systems in Tyne and Wear and Durham to increase their functionality and interoperability. This will have a number of benefits across the area. It will:

- allow the region to address the aspirations of national government policy, such as congestion reduction;
- Improve public transport journey times and reliability
- assist in the delivery of the Statutory Network Management Duty;
- Improve information for emergency planning & resilience.
- Improve data capture and data sharing
- allow better partnership working with partners such as Northumbria Police / Durham Police.
- allow better management of special events and major incidents;
- facilitate improvements to public transport passenger information;
- allow an improvement in the ability to manage and direct traffic and its behaviour;
- improve air quality in Air Quality Management Areas (AQMAs);
- improve consistency of journey times;
- increase efficiencies for emergency services; and
- the ability to coordinate and liaise more efficiently with neighbouring highway authorities and the Highways Agency management infrastructure.

Gateway Improvements

The gateways component of the LSTF capital bid aims to alleviate congestion on the A1 and A19 by encouraging rail or Metro travel. The following sites were chosen because they broadly parallel these routes on a north-south axis.

- Morpeth Rail Station
- Newcastle International Airport
- Newcastle Central Rail Station
- Sunderland Central Rail Station
- Durham Rail Station

Cycling Schemes

The cycling component of the LSTF capital package aims to encourage sustainable travel to key gateways and large destinations. This will contribute to reducing congestion on the trunk road network by encouraging modal shift to heavy rail and more sustainable modes such as cycling.

The cycling schemes are:

- Newcastle Central Station Cycle Route - cycle scheme to improve access to Newcastle Central Station from Gateshead Town Centre
- Morpeth Access to Town Centre and Rail Station – scheme to improve cycle links to Morpeth Station from nearby residential areas
- Sunderland Station – High quality cycle link from the Wearmouth Bridge into the urban core (including rail station) from the north and then connecting into Mowbray Park
- South Shields ferry landing cycle scheme – cycle route on the south bank of the River Tyne via. The Shields Ferry. Improves access to South Shields town centre and sustainable access to the Ferry for onward journeys into North Tyneside.
- Durham Station cycle scheme – Aykley Heads-Durham Station Link scheme proposes to improve cycle links to the railways station from the large employment sites at Aykley Heads
- Cobalt business park access- Improved access to Cobalt Business Park (the UK's largest office park) and Tyne Tunnel Trading Estate via the Waggonways to the coast.

The six cycling schemes have the potential to encourage access to key gateways and large employment sites by sustainable means. It is anticipated that the schemes will contribute to reducing congestion on the trunk road network by encouraging modal shift to heavy rail as well as improved links with transport interchanges and employment sites.

Green Light to Work (Scooters Scheme)

The Go Smarter, Green Light to Work Scooter hire scheme has been operational in rural Gateshead since April 2013. From September 2013 the scheme was extended to the whole Tyne and Wear area and this capital investment is designed to allow the 7 local authorities in the North East Enterprise Partnership to extend the scheme across the entire LEP area. Revenue funding for the scheme will be sought via DfT's LSTF revenue process. The scheme allows jobseekers and those requiring access to training or

education to access these services from areas that have irregular or no access to public transport.

Public Transport

Better Bus Areas Fund (Funding awarded, project underway)

The Better Bus Area project (developed in partnership with operators) was designed to address delays to buses, and to improve all aspects of the bus journey experience along key bus corridors across Tyne and Wear.

19 key corridors, carrying up to 22,000 bus journeys per day, were identified by highway authorities, bus operators and Nexus as suitable for Urban Traffic Management Control (UTMC) interventions. In part, this has been achieved by the use of Intelligent Transport Systems, enhanced CCTV/Automatic Number Plate Recognition (ANPR) coverage and signalisation of key junctions. The project addresses pinch-points, improves enforcement of bus priority measures and aims to reduce hold-ups at key locations where frequent bus services experience regular delays.

Allied to this are a range of complementary measures along these corridors that will improve the passenger experience: bus stop and interchange security improvements (including an expansion of CCTV coverage at another 70 bus shelters), use of Near Field Communication technology, a new route for buses that reduces journey distances and emissions in Sunderland, and making bus stop clearways legally enforceable.

Local Sustainable Transport Fund (Full approval, 2015/16)

In March 2014 Tyne and Wear submitted a revenue bid for funding from the Local Sustainable Transport Fund 2015/16.

The bid states that the biggest transport challenge in Tyne and Wear is congestion on two main highway corridors, the A1 Western Bypass and the A19. This results in increased delays and unreliable journey times, slowing our economic recovery and putting new jobs at risk. The revenue funding proposal not only builds upon Tyne and Wear's current successful LSTF funded programmes of *Go Smarter to Work* and *Schools Go Smarter* but also support those Local Growth Fund capital projects (identified in the SEP) which are focused on sustainable travel.

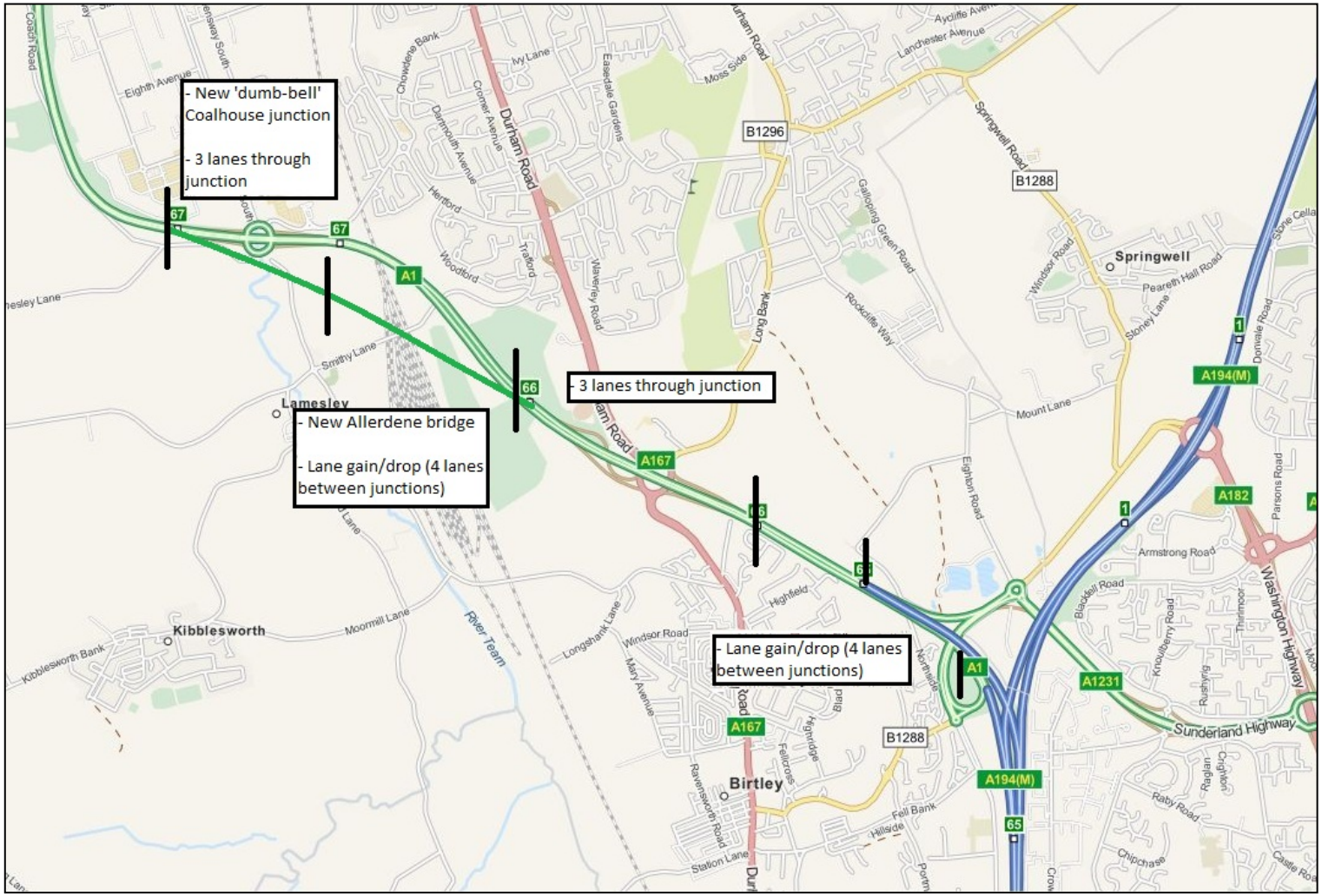
The Tyne and Wear LSTF revenue package will:

- Encourage behaviour change in car commuters, through a business engagement programme and associated 'Toolkit of Measures', building on the progress already made in the current Go Smarter to Work programme;
- Encourage behaviour change in parents and school pupils to increase the use of sustainable modes of travel for the 'school run', through the continued delivery of the popular Schools Go Smarter programme;
- Improve travel information and marketing, supporting our LSTF capital package as part of the North East Strategic Economic Plan; and
- Support Jobseekers, including young people, entering work and /or training, particularly where transport is a barrier.

Appendix C

Options Assessment Framework Output – Mainline Schemes

1.1 Option 1B: Birtley to Coalhouse including new Allerdene Railway Bridge



Option Assessment Framework (Strategic Fit)				
Option 1B: Birtley to Coalhouse including new Allerdene Railway Bridge				
Assessment Area	**Category**	**Objective**	**Qualitative Impacts**	**Qualitative Score**
Regional Transport and Spatial Strategy	Regional Policy Alignment	Improve Economic Performance of Region	Fits with wider national, regional and local policies that consider that improvements to A1 NGWB are fundamental to the economic performance of the region.	7
		'Doing more with less'	Not necessarily 'doing more with less' as significant scale of scheme.	2
		Maintain and improve accessibility to jobs, housing and key services	The scheme improves access to the Team Valley employment zone.	7
		Reduction in the variability of journey times along the corridor	The scheme should reduce delays and incidents impacting on reliability.	7
		Reduction in collisions, in particular incidents involving pedestrians.	Heavy weaving occurs between Junctions 65 and 66 and accidents often lead to lane closures and associated reliability issues and the problems are forecast to worsen in the future. The scheme is designed to increase capacity and thereby reduce delays, impact of weaving and safety issues, however there will still be weaving and merging on the sections between these junctions.	6
	Local Policy Alignment	Supporting more housing developments in the area and wider region	The scheme will increase capacity on the A1 NGWB and therefore support housing developments in the vicinity of the road and the wider region.	6

		Maintaining air quality with regard to European legal standards.	More freely flowing traffic may improve air quality, however this may be offset by increased traffic flows. Moving road alignment is predicted to have a positive impact on air quality.	5
Meeting Intervention Objectives	Scheme Objectives Fit	Economic Growth and Development	The scheme reduces delays and incidents impacting on reliability. Improves access to Team Valley employment zone.	6
		Movement of Goods and Access to Transport Hubs	The scheme will increase capacity and lead to fewer incidents and reduce delays which will enhance the role of the A1 NGWB corridor for moving goods.	5
		Accessibility	The scheme will improve accessibility to employment in Team Valley and to/from Birtley Neighbourhood Opportunity Area.	7
		Journey Times	The increase in capacity will reduce the number of incidents and delays which will lead to an improvement in journey times particularly during peak times.	7
		Safety	Section currently experiences high flows, delays and accidents. Heavy weaving occurs between Junctions 65 and 66 exacerbating the problems. Accidents often lead to lane closures & associated reliability issues. Problems forecast to worsen in the future. Scheme is designed to increase capacity and thereby reduce delays, impact of weaving and safety issues.	6
		Resilience	The increase in capacity is likely to lead to a reduction in accidents, improvements to journey times and reliability. The provision of additional lanes improves resilience of the network when incidents do occur.	6
		Environment	Some reductions in carbon & AQ issues likely to occur due to more freely flowing traffic. Fairly significant construction works will lead to negative impacts on natural environment. Scheme may result in noise increases in properties adjacent to A1 / offline section. Green belt either side of the A1 is likely to be affected.	3
		Deliverability	Offline works to Allerdene Bridge likely to lead to increased implementation timetable.	2

Option Assessment Framework (Value for Money)				
Option 1B: Birtley to Coalhouse including new Allerdene Railway Bridge				
Objective	**Sub-Objective**	**Qualitative Impacts**	**Quantitative Measures**	**Qualitative Score**
Economy	Business Users & Transport Providers	Journey times will improve and vehicle operating costs will be reduced due to higher travel speeds for users travelling at congested times. The increase in capacity will also reduce delays which will improve reliability. Increasing the capacity on this section of the A1 NGWB will also lead to connectivity benefits for business users and freight through the improvement in linkages between locations of economic importance in the region.	To be quantified in Stage 3.	7
	Reliability	Reduces delays and incidents impacting on reliability particularly at peak times.	None.	7
	Regeneration	Improves access to Team Valley employment zone.	None.	6

Environment	Noise	Realignment (of road and junction) would reduce noise to large numbers of properties in Harlow Green to the north. However, a smaller number of properties to the south could experience an equivalent increase. Very substantial negative impacts could be expected at the 'Horse World' commercial property immediately south of the new, proposed junction. Off-line widening to D3AP likely to increase overall noise emissions due to decreasing congestion (free flowing traffic generally produces more noise), and likely marginal increase in road users on this segment. The spatial effects of widening (i.e. carriageway approaches closer to receptors) are likely to be negligible, except for properties located very close to the existing carriageway (i.e. within 7-8m).	Relatively large number of residential properties potentially subject to a moderate, beneficial decrease in road traffic noise (up to 3dB). Smaller number of residential properties potentially subject to a moderate, adverse increase in road traffic noise (up to 3dB). Isolated commercial properties potentially subject to significant adverse increase in road traffic noise of above 5dB. All properties subject to marginally increased noise (est. <1dB) in general due to reduced congestion / increased use. Smaller numbers of properties close to carriageway may experience a marginal increase due to spatial widening (<1dB).	Varies by property between moderate beneficial and large adverse. Estimated net effect of slight beneficial = 5

	Air Quality	The Off Line Widening would result in a handful of properties being located closer to the carriageway. Similarly, the On Line Widening would result in existing sensitive receptors (e.g. residential dwellings) between J65 and J66 being located approximately 3.65m closer to the existing carriageway. These properties may experience a slight worsening in air quality as a result of the proposed interventions. These effects will be offset by the increased distance between properties in Salcombe Gardens and Woodford, and associated improvement in air quality. These properties are currently located approximately 130-150m north/northeast of the carriageway and with the scheme in place, will be greater than 200m from the realigned road. Given that pollution concentrations decrease rapidly with distance from source, any improvements are likely to be marginal. Notwithstanding the above, given that the proposed interventions are aimed at reducing congestion and encouraging the free flow of traffic, both of which will benefit local air quality, the overall the effects of Scheme 1 are considered to be positive in terms of air quality. The above does not take into account any redistribution effects which may occur as a result of the proposed interventions.	None	5
	Greenhouse Gases	Lane widening will result in an increase in traffic, which may be partially offset by reduced emissions from free flowing traffic at 60-70mph	None	3

	Landscape	In broad terms the landscape character of the area between junctions 65-67 is largely rural with large field patterns and intermittent individual properties. An urban area of residential properties lies to the south between junctions 65 and 66. Designated Green Belt is situated to the north adjacent to the A1 along the whole of Section 1 and also to the south between junctions 66 and 67. Sustrans route 11 passes underneath the A1M south of junction 65, this may have implications on the widening in this location. Overall this option will have a larger negative impact on the wider landscape character where the scheme goes off line and the development will be situated within the Green Belt. The online widening through this section may have a short to medium term moderate adverse potential impact on the rural character due to vegetation removal.	This option is likely to have a potential adverse impact upon the setting of the designated Green Belt.	2
	Townscape	Section 1 is a mainly rural area with urban development limited to the south between junctions 65-66. The following visual receptors have been identified • Residential area to the South between junctions 65-66 • St Joseph's RC Primary school 100m south situated between junctions 65-66 There is a key vista from the Angel of the North situated 100m north of the A1 to the north of junction 66. Although not a designated site, the Angel of the North is nationally recognised as important public art and is a popular visitor attraction. The removal of vegetation to enable the widening and new bridge is likely to have a potentially moderate adverse impact upon the identified visual receptors.	Important views are possible from residential areas including community buildings eg schools, the A1 may be visible from upper storeys of the properties. Potential adverse impact upon view to and from the Angel of the north	2

	Historic Environment	Historic maps illustrate the development of the area from a rural landscape dotted with small villages to one that is still largely rural but built up with large residential and industrial areas along the railway line. There are seven Grade II listed buildings and 1 Scheduled Monument (SM) situated less than 1km from the proposed option in Section 1. All of these may potentially be adversely affected.. There are no Grade I or II* buildings. • Three Grade II listed building are situated some 800m to the south of Junction 65 - St Johns Church, A School House and Em Perkins Statue. • Four Grade II listed buildings are situated approximately 600m south of Junction 67 • Bowes Railway SM crosses the A1 300m south of Junction 66. Overall this option is likely to have little potential effect upon the listed buildings in the area due to their distance from the A1. This option is likely to have a potentially moderate adverse impact on the Bowes Railway SM where the road is widened.	This option is likely to have an potential adverse impact upon Bowes railway SM	2
	Biodiversity	An area of ancient woodland abuts the A1 on the south western portion of junction 66. Given the extent of the route, it is likely that protected species such as Bats, Badgers and Great Crested Newts will be present in the area. The overall potential effect is likely to be limited to the potentially moderate to slight adverse impact upon the ancient woodland at Junction 66 as land take is needed for the widening and the offline section. There may also be potential adverse impacts on protected species however further surveys would be needed to establish this.	This option is likely to have a potential adverse impact upon the ancient woodland at Junction 66 if land take is required	2

	Water Environment	Junction 67 lies within flood zones 2 and 3 and is a drainage hotspot.	Extent of development in the floodplain (measured as length (km) in flood zone 3b). Residual Flood Risk (measured as length (km) in flood zone 2). 0.4km flood zone 3 0.2km flood zone 2	3
Society Impact	Non-business users	Journey times will improve and vehicle operating costs will be reduced for users travelling at congested times. The increase in capacity should reduce the number of incidents and delays and lead to an increase in reliability. There will be some connectivity benefits but not as great as for business users as leisure trips are more likely to be undertaken at less congested times.	To be quantified in Stage 3.	6
	Physical Activity	It is thought to be unlikely that the scheme will significantly impact on the number of walking and cycling trips.	None.	4
	Journey Quality	There may be a small reduction in traveller stress due to fewer delays which may reduce frustration and the fear of being involved in an accident may also be reduced.	None.	5
	Accidents	Heavy weaving currently occurs between Junctions 65 and 66 and accidents often lead to lane closures and associated reliability issues and the problems are forecast to worsen in the future. The scheme is designed to increase capacity and thereby reduce delays and the impact of weaving and safety issues, however there will still be weaving and merging on the sections between the junctions.	To be quantified in Stage 3.	6
	Security	The scheme is unlikely to have any impact on the risk of crime.	None.	4

	Access to Services	People will be “at least no worse off” as a result of the scheme.	None.	4
	Affordability	Will result in a reduction in vehicle operating cost (VOC) as a result of reduced queuing.	None.	5
	Severance	The scheme will have no impact on the routes used by pedestrians, cyclists and equestrians.	None.	4
	Option Values	There is unlikely to be any impact on option values as a result of the scheme.	None.	4
Public Accounts	Cost to Transport Budget	Total cost estimate (incl. preparation, supervision, land, works and optimism bias). Produced by HA Commercials team converted to PVC.	£292m	N/A
	Indirect Tax Revenues	There may be a small reduction in indirect tax revenue due to the increased capacity which may lead to less start-stopping and therefore reduce fuel consumption.	None.	3
Indicative Benefit Cost Ratio	Cost to Private Sector	Zero.	Zero.	N/A
	Indicative Net Present Value	Not calculated at this stage.	To be quantified in Stage 3.	N/A
	Indicative BCR	Not calculated at this stage. Anticipated capital cost likely to be high but maintenance and disruption costs likely to be very high in the Do Minimum scenario.	To be quantified in Stage 3.	Medium: BCR = 1.5-2.

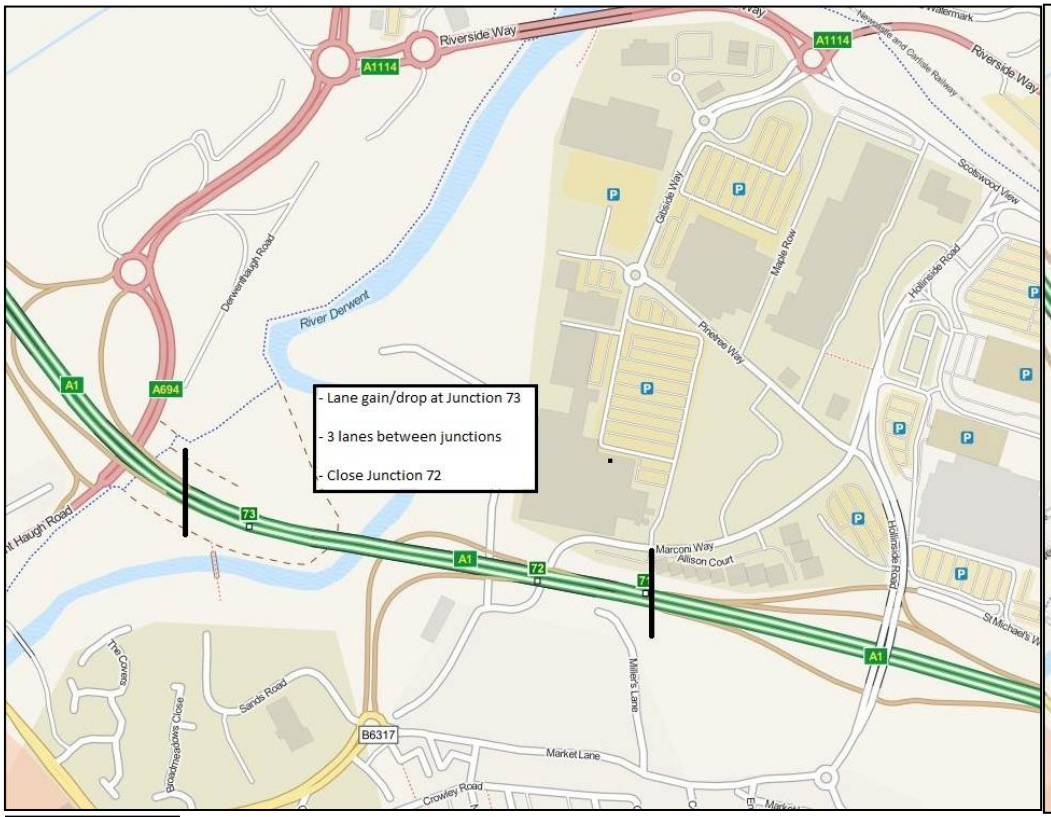
Option Assessment Framework (Financial Case)				
Option 1B: Birtley to Coalhouse including new Allerdene Railway Bridge				
Assessment Area	**Category**	**Qualitative Impacts**	**Quantitative Measures**	**Qualitative Score**
Capital and Revenue Costs	Outturn cost to implement	Total cost estimate (incl. preparation, supervision, land, works and optimism bias). Produced by HA Commercials team.	£427m	N/A
	Operating and Maintenance Costs	Maintenance cost is anticipated to be high between Junctions 65 and 66 and low between Junctions 66 and 67 during the design life of the scheme. The cost of maintaining the existing Allerdene Bridge is already significant and is expected to increase going forwards. Without the replacement of the bridge this will be a significant issue in the future.	N/A	7
Funding Assumptions	Funding Allocation	The scheme would be funded by Central Government.	None.	N/A

Option Assessment Framework (Delivery Case)			
Option 1B: Birtley to Coalhouse including new Allerdene Railway Bridge			
Assessment Area	**Qualitative Impacts**	**Quantitative Measures**	**Qualitative Score**
Likely Delivery Agents	There are some issues regarding the deliverability of scheme, especially construction of offline section. Highways Agency will be the delivery agents.	None	5

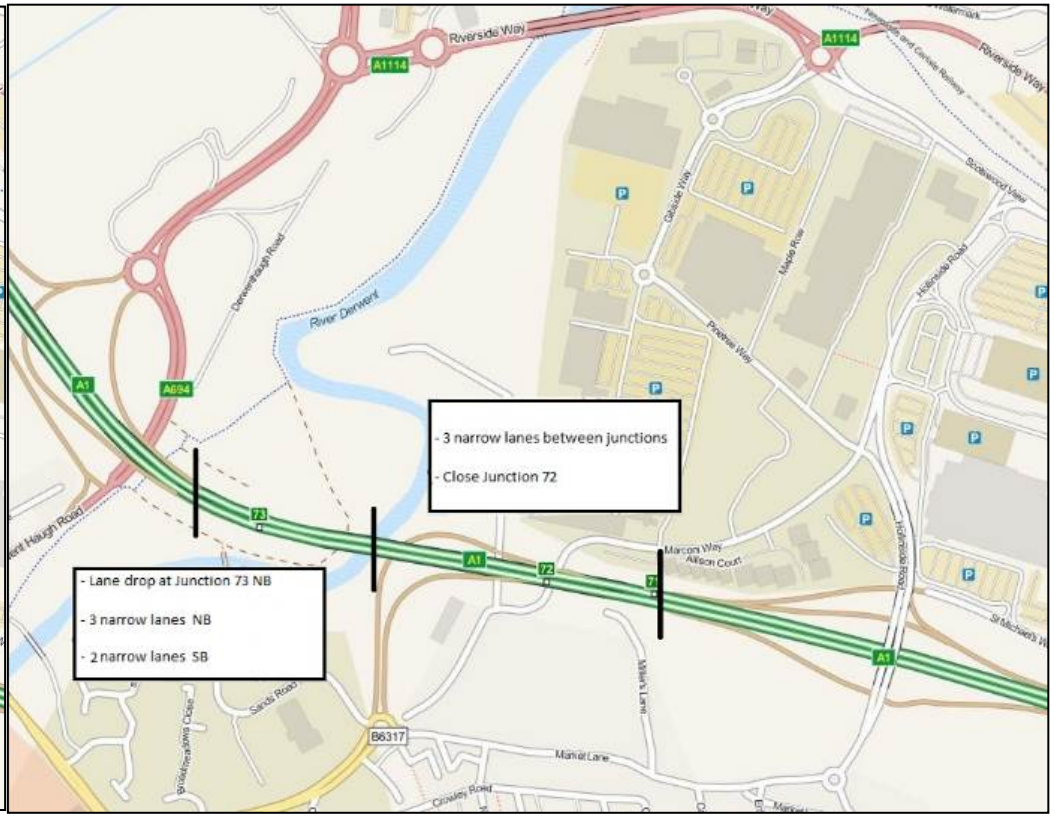
Stakeholder Acceptability	There is a general consensus of stakeholders over need for interventions.	None	6
Public Acceptability / Interest	Public acceptability depends on alignment of offline section and associated impact on existing dwellings / roads. However, the scheme will have high acceptability with the majority of those who use the road.	None	6

Option Assessment Framework (Commercial Case)			
Option 1B: Birtley to Coalhouse including new Allerdene Railway Bridge			
Assessment Area	**Qualitative Impacts**	**Quantitative Measures**	**Qualitative Score**
Route to Market	Scheme to be financed by Central Government. Construction of new bridge likely to be highest risk element of scheme	None	3

1.2 Options 2A & 2C: Metrocentre to Derwenthaugh



Option 2A



Option 2C

Option Assessment Framework (Strategic Fit)						
Options 2A & 2C: Metrocentre to Derwenthaugh						
Assessment Area	**Category**	**Objective**	**Qualitative Impacts**		**Qualitative Score**	
			Option 2A	**Option 2C**	**Option 2A**	**Option 2C**
Regional Transport and Spatial Strategy	Regional Policy Alignment	Improve Economic Performance of Region	Scheme fits with wider national, regional and local policies that consider improvements to A1 NGWB are fundamental to the economic performance of the region.	Option 2C is also likely to improve the economic performance of the region but the increase in capacity is less than Option 2A so the impact is likely to be smaller in scale.	6	5
		‘Doing more with less’	Not necessarily 'doing more with less' as fairly significant scale of scheme widening underbridges.	Good example of 'doing more with less' as creating additional lanes in existing highway boundary rather than widening underbridges.	2	5
		Maintain and improve accessibility to jobs, housing and key services	Both schemes will improve access to the Metrogreen regeneration site. Some disbenefits to existing users of Junction 72 which will close as part of the scheme.		5	5
		Reduction in the variability of journey times along the corridor	Reduces delays and incidents impacting on reliability.		5	5

		Reduction in collisions, in particular incidents involving pedestrians.	Option 2A is likely to lead to a reduction in the number of collisions compared with the current situation due to the significant increase in capacity. The closure of Junction 72 will reduce weaving which will further reduce the risk of collisions.	Option 2C is also likely to lead to a reduction in the number of collisions due to the increase in capacity. The number of collisions is likely to be slightly higher than Option 2A due to the higher risk of side swipes with narrow lanes but the severity index is likely to be lower due to the 50mph speed limit.	6	5
	Local Policy Alignment	Supporting more housing developments in the area and wider region	Option 2A is likely to provide more support to housing developments due to the greater capacity it offers and in particular higher travel speeds than Option 2C.	The scheme will increase capacity on the A1 NGWB and therefore support housing developments in the vicinity of the road and the wider region.	5	5
		Maintaining air quality with regard to European legal standards.	Poor air quality between Junctions 71 and 72 which is predicted to exceed EU levels going forward. More freely flowing traffic may improve air quality, however this may be offset by increased traffic flows.	Poor air quality between Junctions 71 and 72 which is predicted to exceed EU levels going forward. More freely flowing traffic may improve air quality, however this may be offset by increased traffic flows.	4	4
Meeting Intervention Objectives	Scheme Objectives Fit	Economic Growth and Development	Reduces delays and incidents impacting on reliability. Some disbenefits to existing users of Junction 72 which will close as part of the scheme. Relatively short scheme length so moderate level of benefits.	Reduces delays and incidents impacting on reliability but to a lesser extent than Option 2A. Some disbenefits to existing users of Junction 72 which will close as part of the scheme.	6	5
		Movement of Goods and Access to Transport Hubs	The scheme will increase capacity and lead to fewer incidents and reduce delays which will enhance the role of the A1 NGWB corridor for moving goods.	The scheme will have a positive impact due to the increase in capacity provided but the effect will not be as great as Option 2A due to the lower 50mph speed limit.	5	5

		Accessibility	The increase in capacity the schemes provide along the A1 NGWB corridor will increase accessibility but the closure of Junction 72 as part of the scheme will reduce accessibility to and from the areas served by this junction.		5	5
		Journey Times	Journey times will reduce due to the increase in capacity which will reduce the number of delays and incidents and therefore improve traffic flow.	The reduction in journey times in the peaks will not be as great in Option 2C as the use of narrow lanes require a speed limit of 50mph compared to the 70mph speed limit of D3AP in Option 2A.	6	5
		Safety	Scheme designed to increase capacity and reduce weaving through Junction 72 closure and thereby reduce delays, impact of weaving and safety issues.	The reduction in the number of collisions is unlikely to be as great with Option 2C due to the narrow lanes but the severity index will be lower due to the lower speed limit.	6	5
		Resilience	The increase in capacity is likely to lead to a reduction in accidents, improvements to journey times and reliability.	There is likely to be a reduction in the number of accidents but the impact is unlikely to be as great in Option 2A.	5	5
		Environment	Some reductions in carbon / emissions likely to occur due to more freely flowing traffic. However, some increases may occur due to potential for more traffic to use this section of the route.	Some reductions in carbon / emissions likely to occur due to more freely flowing traffic. However, some increases may occur due to potential for more traffic to use this section of the route.	3	3

		Deliverability	There are potential issues with the deliverability of the scheme, especially changes to the underbridges and the widening of Derwenthaugh Bridge is unlikely to be feasible within the timescales. Bridge works likely to lead to increased implementation timetable. Relatively short scheme extent so not likely to generate large benefits in comparison with potentially high costs.	There are potential issues with the deliverability of the scheme but the structures works required are minimal and the scheme is within existing highway boundary, hence implementation time scale is less than Option 2A.	2	4

Option Assessment Framework (Value for Money)							
Options 2A & 2C: Metrocentre to Derwenthaugh							
Objective	**Sub-Objective**	**Qualitative Impacts**		**Quantitative Measures**		**Qualitative Score**	
		Option 2A	**Option 2C**	**Option 2A**	**Option 2C**	**Option 2A**	**Option 2C**
Economy	Business Users & Transport Providers	There will be journey time savings as a result of the increase in capacity which will reduce the number of incidents and delays and reduce average journey times. There will also be a reduction in vehicle operating costs due to less stop starting at congested times. Increasing the capacity on this section of the A1 NGWB will also lead to connectivity benefits for business users and freight through the improvement in linkages between locations of economic importance in the region.	There will be journey time and vehicle operating cost savings and connectivity benefits with Option 2C compared to the current situation. The improvements however will not be as great as in Option 2A due to the 50mph speed limit.	To be quantified in Stage 3.		6	5
	Reliability	The increase in capacity and removal of short weaving section is likely to lead to a reduction in the number of collisions and therefore delays.	The increase in capacity provided is likely to lead to an increase in reliability compared to the current situation but the number of collisions is likely to be greater than in Option 2A because of the use of narrow lanes.	None.	None.	5	5

	Regeneration	The scheme would increase capacity on a key corridor which will increase accessibility to jobs.	Option 2C is likely to have less of an impact on regeneration than Option 2A as the increase in capacity provided is not as great.	None.	None.	5	5
Environment	Noise	On-line widening to D3AP likely to increase overall noise emissions due to decreasing congestion (free flowing traffic generally produces more noise), and likely marginal increase in road users on this segment. The spatial effects of widening (i.e. carriageway approaches closer to receptors) upon noise levels are likely to be negligible, except for properties located very close to the existing carriageway (i.e. within 7-8m).	On-line provision of narrow lanes likely to increase overall noise emissions due to decreasing congestion (free flowing traffic generally produces more noise), and likely marginal increase in road users on this segment. However, relative to Option 2A, noise emissions are likely to be lower due to reduced top-end speeds. The spatial effects of narrow lanes upon noise levels are likely to be negligible.	Population numbers affected will be similar to Option 2C, although with a smaller number also affected by spatial widening. It is not expected that the proposed intervention would increase noise levels by more than 3dB.	Population numbers affected will be similar to Option 2A. It is not expected that the proposed intervention would increase noise levels by more than 3dB.	3	3

	Air Quality	The proposed widening would result in an increase in carriage width by approximately 3.65m either side of the A1, reducing the distance between the carriageway and sensitive receptors. A review of detailed mapping in the vicinity of the A1 indicates that there are no existing residential dwellings located immediately adjacent to the A1 between J71 and J73, with the exception of properties within The Copse (located adjacent to the J73 northbound slip, and approximately75m from the main A1 carriageway). Consequently, widening the carriageway between J71 and J73 is considered unlikely to have a significant effect on local air quality. Furthermore, the proposed interventions would result in reduced congestion on the network and increase the ability of the traffic to flow more freely which would have positive benefits for local air quality.	The narrow lanes option would result in an increase in carriage width by approximately 1m either side of the A1. Similar to Option 2A, this would have a negligible effect on air quality due to the limited number of sensitive receptors within the immediate vicinity of the carriageway along this section of the A1, and their proximity (>75m). Furthermore, the proposed interventions would result in reduced congestion on the network and increase the ability of the traffic to flow more freely which would have positive benefits for local air quality.	None	None	4	4
	Greenhouse Gases	Lane widening will result in an increase in traffic (and emissions), which may be partially offset by reduced emissions from free flowing traffic at 60-70mph	Lane widening will result in an increase in traffic (and emissions), which may be partially offset by reduced emissions from free flowing traffic at 50mph (lower emissions than at higher speeds)	None	None	3	3

	Landscape	The character of Section 2 is mainly industrial and retail. To the north of the A1 there are major retail outlets including the Metrocentre, Ikea and a large Asda all with associated large area of car parking. Smaller industrial units are situated to the south. South of the A1 between Junction 71 and 72 is Swalwell village. A small industrial village with rows of terraced properties and a population of approximately 3,200. The River Derwent passes underneath the A1 west of Junction 72. The riverbanks are densely vegetated and a public footpath runs alongside the river's eastern bank. To the south of the A1 and east of Junction 71 is designated Green Belt. Works to this junction may encroach into and adversely impact upon the Green Belt. There are substantial areas of vegetation around Junctions 71 and 72. The removal of these areas to allow full widening may have a potential slight to moderate adverse impact on the character of the area and the Green Belt.	This option is likely to have a potential adverse impact upon designated Green Belt.	3	3

	Townscape	In relation to visual impact, given the proximity of residential properties, Green Belt and rural areas containing Public Rights of Way, the potential exists for adverse impacts upon all of these receptors. The following visual receptors have been identified: • Residential area to the south of Junction 72 There are key views from the public footpath along the River Derwent, that passes underneath the A1 at Junction 72. The removal of vegetation to enable the widening is likely to have a potentially slight to moderate adverse impact upon the identified visual receptors.	The narrow lanes option would limit the adverse impact upon the visual receptors.	Important views are possible from residential areas including community buildings eg schools and shops. The A1 may be visible from upper storeys of the properties. The public right of way also has key views of the surrounding areas.	2	3

	Historic Environment	Historic maps illustrate the development of the area from a rural landscape dotted with small villages to one built up with large residential areas and industrial units along the southern bank of the Tyne. The introduction of major highways doesn't appear until the 1980's along with the Metrocentre This section has little historic value. There are two Grade II listed monuments situated approximately 400m south of Junction 72. Overall, these options are likely to have a slight adverse effect upon the setting of the Listed Buildings, additional views of the road corridor may be created with the removal of vegetation although the distance of the buildings to the road corridor means the impact would remain slight.		No		3	3
	Biodiversity	Shibdon Pond Site of Special Scientific Interest (SSSI) and Local Nature Reserve (LNR) run concurrently along the northern A1 highway boundary 100m north of Junction 73. It is likely that protected species such as Bats, Badgers and Great Crested Newts may be present in the area. The overall impact of widening this section is likely to be limited to the potential adverse impact upon the SSSI and LNR from the removal of vegetation and extension of the carriageway. There may also be potential large to moderate adverse impacts on protected species. Further surveys would be needed to establish the impact upon protected species.	The design of 3 narrow lanes within the highway boundary is likely to limit the potential impact to slight adverse upon the SSSI and LNR, There may also be potential adverse impacts on protected species however further surveys would be needed to establish this.	This option would potentially impact upon both Shibdon pond SSSI and LNR	This option is likely to have a minor potential impact upon both Shibdon pond SSSI and LNR	2	3

	Water Environment	Junction 72 lies within flood zones 2 and 3 and is a drainage hotspot.	Junction 72 lies within flood zones 2 and 3 and is a drainage hotspot.	0.4km flood zone 3 0.1km flood zone 2	0.4km flood zone 3 0.1km flood zone 2	3	3
Society Impact	Non-business users	There will be journey time savings as a result of the increase in capacity which will reduce delays and increase average speeds.	The journey time savings are likely to be lower in Option 2C due to the lower speed limit than in Option 2A which will lead to longer journey times at less congested times.	To be quantified in Stage 3.		6	5
	Physical Activity	The scheme will have no impact on the number or length of walking or cycling trips.		None.	None.	4	4
	Journey Quality	The may be a small reduction in traveller stress due to fewer delays which may reduce frustration and the fear of being involved in an accident may also be reduced.		None.	None.	5	5
	Accidents	The scheme is likely to reduce the number of collisions due to the significant increase in capacity and the removal of the short weaving section between Junctions 72 and 71	The reduction in collisions in Option 2C is not likely to be as great as in Option 2A but the severity index will be lower due to the lower speed limit.	To be quantified in Stage 3.		6	5
	Security	The scheme is unlikely to have any impact on the risk of crime.		None.	None.	4	4
	Access to Services	People will be “at least no worse off” as a result of the scheme.		None.	None.	4	4
	Affordability	Will result in a reduction in vehicle operating cost (VOC) as a result of reduced queuing.		None.	None.	5	5

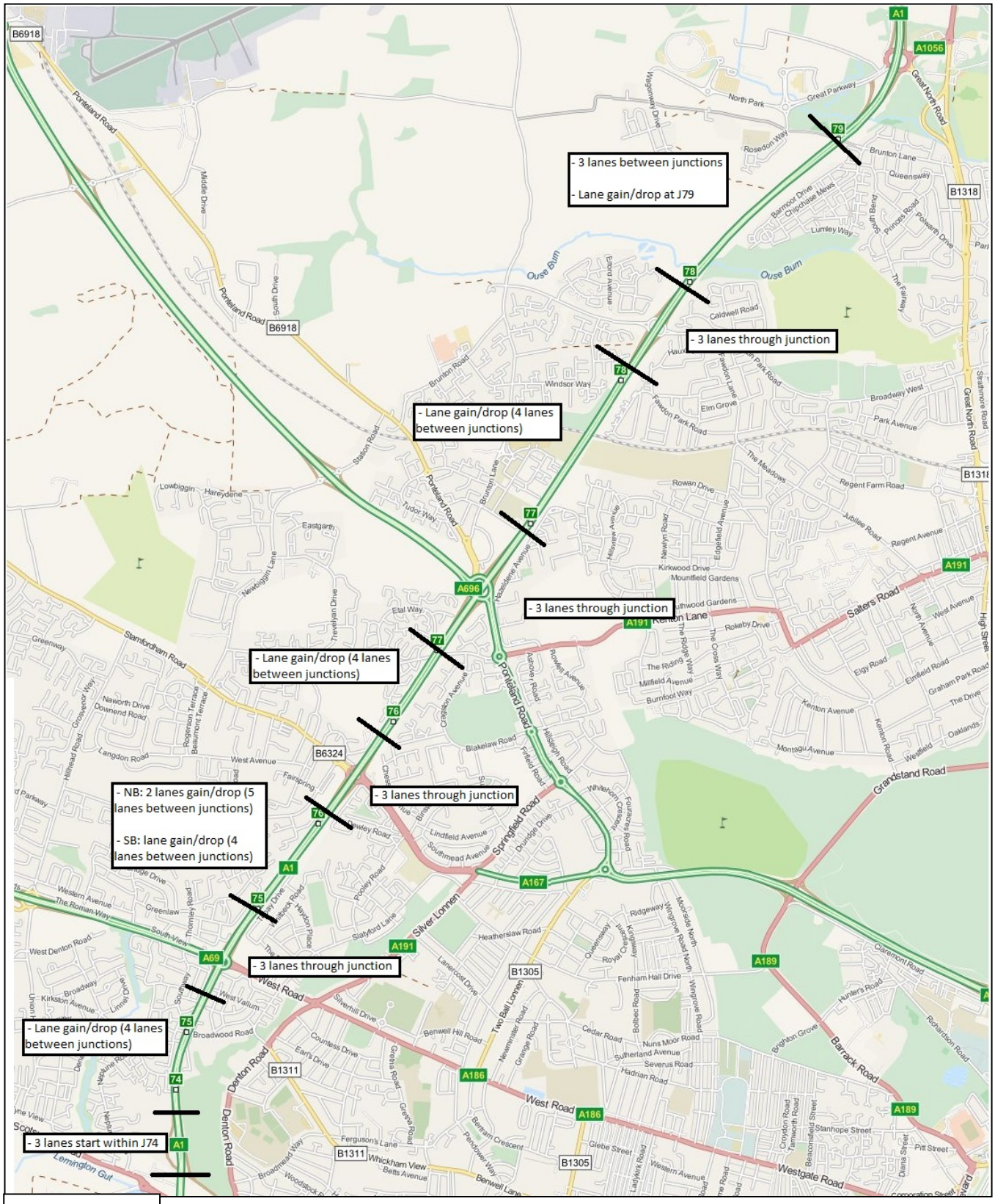
	Severance	The scheme will have no impact on the routes used by pedestrians, cyclists and equestrians.	None.	None.	4	4
	Option Values	There is unlikely to be any impact on option values as a result of the scheme.	None.	None.	4	4
Public Accounts	Cost to Transport Budget	Total cost estimate (incl. preparation, supervision, land, works and optimism bias). Produced by HA Commercials team converted to PVC.	Total cost estimate (incl. preparation, supervision, land, works and optimism bias). Produced by HA Commercials team converted to PVC.	£61m	£40m	N/A	N/A
	Indirect Tax Revenues	There may be a small reduction in indirect tax revenue due to the increased capacity which may lead to less start-stopping and therefore reduce fuel consumption.	The reduction in indirect tax revenues may be slightly greater in Option 2C due to the lower speed limit (50mph) than in Option 2A (70mph) which may lead to lower levels of fuel consumption.	None.	None.	3	3
Indicative Benefit Cost Ratio	Cost to Private Sector	Zero.		Zero.	Zero.	N/A	N/A
	Indicative Net Present Value	Not calculated.	Not calculated.	To be quantified in Stage 3.		N/A	N/A
	Indicative BCR	Not calculated, estimated based on schemes elsewhere. Relatively short scheme extent so not likely to generate large benefits in comparison with potentially high costs.	Not calculated, estimated based on schemes elsewhere. Less benefit than 2A but also less cost.	To be quantified in Stage 3.		Low: BCR = 1-1.5.	Medium: BCR = 1.5-2.

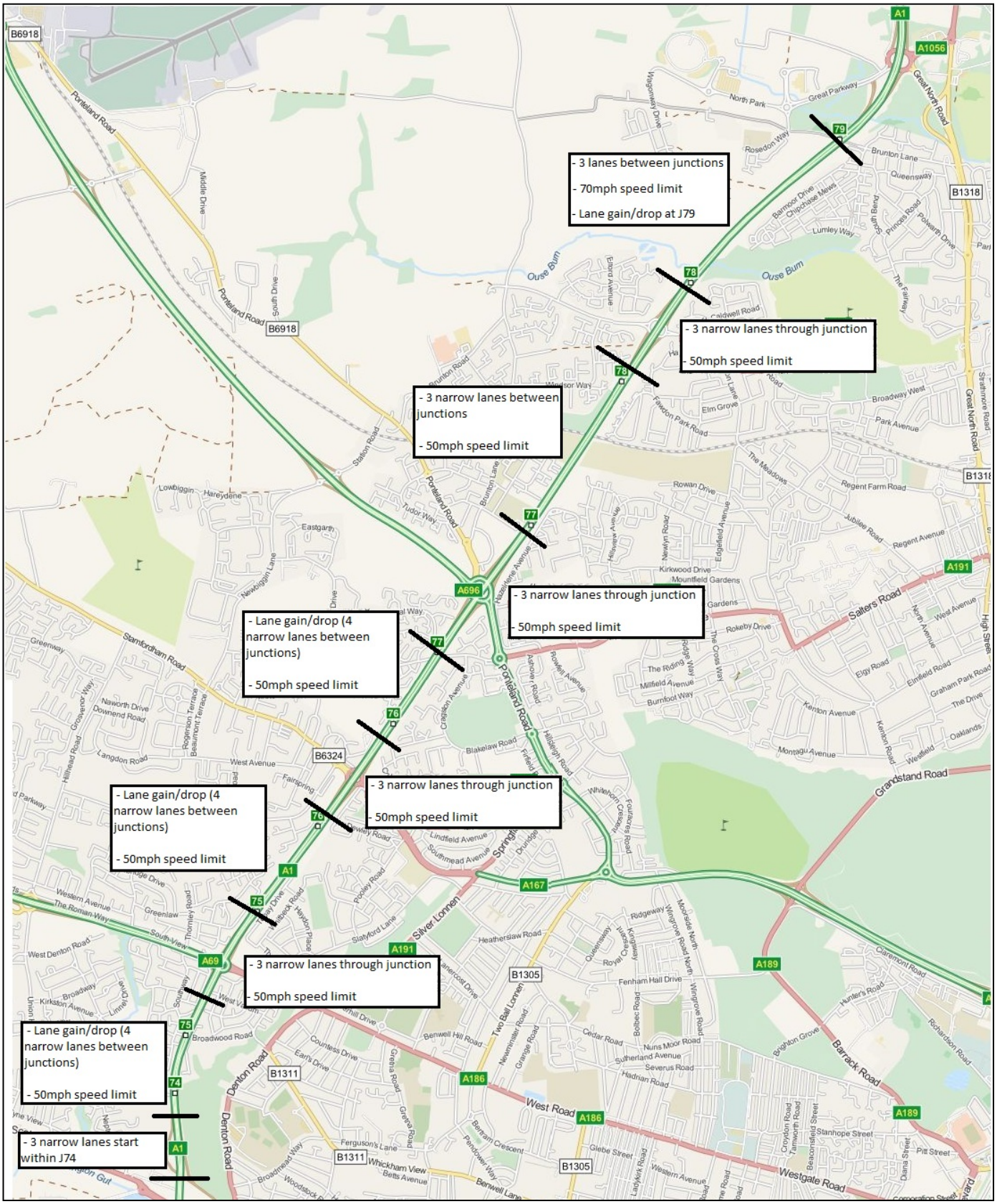
Option Assessment Framework (Financial Case)							
Options 2A & 2C: Metrocentre to Derwenthaugh							
Assessment Area	**Category**	**Qualitative Impacts**		**Quantitative Measures**		**Qualitative Score**	
		Option 2A	**Option 2C**	**Option 2A**	**Option 2C**	**Option 2A**	**Option 2C**
Capital and Revenue Costs	Outturn cost to implement	Total cost estimate (incl. preparation, supervision, land, works and optimism bias). Produced by HA Commercials team. Costs for slip road closure plus widening of carriageway and widening of a number of structures.	Total cost estimate (incl. preparation, supervision, land, works and optimism bias). Produced by HA Commercials team. No major structures works are required hence lower cost in comparison to Option 2A.	£87m	£57m	N/A	N/A
	Operating and Maintenance Costs	Increase in maintenance costs due to provision of additional lanes. Closure of Swallwell slips will lead to saving in maintenance of this part of the network. Overall impact likely to be neutral.	Increase in maintenance costs due to provision of additional lanes. Closure of Swallwell slips will lead to saving in maintenance of this part of the network. Overall impact likely to be neutral.	N/A	N/A	4	4
Funding Assumptions	Funding Allocation	The scheme would be funded by Central Government.		None	None	N/A	N/A

Option Assessment Framework (Delivery Case)						
Options 2A & 2C: Metrocentre to Derwenthaugh						
Assessment Area	**Qualitative Impacts**		**Quantitative Measures**		**Qualitative Score**	
	Option 2A	**Option 2C**	**Option 2A**	**Option 2C**	**Option 2A**	**Option 2C**
Likely Delivery Agents	Delivery agent is the Highways Agency.		None.	None.	6	6
Stakeholder Acceptability	General consensus of stakeholders over need for interventions.		None.	None.	6	6
Public Acceptability/ Interest	Main public acceptability issue is likely to be closure of Junction 72.		None.	None.	4	4

Option Assessment Framework (Commercial Case)						
Options 2A & 2C: Metrocentre to Derwenthaugh						
Assessment Area	**Qualitative Impacts**		**Quantitative Measures**		**Qualitative Score**	
	Option 2A	**Option 2C**	**Option 2A**	**Option 2C**	**Option 2A**	**Option 2C**
Route to Market	Scheme to be financed by Central Government. There is unlikely to be any great difficulty or risk in construction of either scheme other than issues surrounding Derwentaugh Bridge.		None.	None.	6	6

1.3 Options 4-6A & 4-6C: Metrocentre to Derwenthaugh




- 3 lanes between junctions
- 70mph speed limit
- Lane gain/drop at J79
- 3 narrow lanes through junction
- 50mph speed limit
- 3 narrow lanes between junctions
- 50mph speed limit
- 3 narrow lanes through junction
- 50mph speed limit
- Lane gain/drop (4 narrow lanes between junctions)
- 50mph speed limit
- 3 narrow lanes through junction
- 50mph speed limit
- Lane gain/drop (4 narrow lanes between junctions)
- 50mph speed limit
- 3 narrow lanes through junction
- 50mph speed limit
- Lane gain/drop (4 narrow lanes between junctions)
- 50mph speed limit
- 3 narrow lanes start within J74
A1
A1056
A696
A167
A191
A189
A186
A69
B6918
B1318
B6324
B1305
B1311
79
78
77
76
75
74
Portland Road
Great North Road
Salters Road
Grandstand Road
Barrack Road
Denton Road
West Road
Westgate Road
Ouse Burn
Silver Lonnen

Option 4-6C

Option Assessment Framework (Strategic Fit)						
Options 4-6A & 4-6C: Scotswood to North Brunton						
Assessment Area	**Category**	**Objective**	**Qualitative Impacts**		**Qualitative Score**	
			Option 4-6A	**Option 4-6C**	**Option 4-6A**	**Option 4-6C**
Regional Transport and Spatial Strategy	Regional Policy Alignment	Improve Economic Performance of Region	Scheme fits with wider national, regional and local policies that consider that improvements to A1 NGWB are fundamental to the economic performance of the region.	Option 4-6C is also likely to improve the economic performance of the region but the increase in capacity is less than Option 4-6A so the impact is likely to be smaller in scale.	7	6
		‘Doing more with less’	Not necessarily 'doing more with less' as significant scale of scheme and involves acquisition of residential land.	Attempt at 'doing more with less' through use of existing highway as much as possible.	2	6
		Maintain and improve accessibility to jobs, housing and key services	Both schemes will improve access to the Metrogreen regeneration site and the Callerton Park Housing Development as well as to other proposed developments in the area.		6	6
		Reduction in the variability of journey times along the corridor	Reduces delays and incidents impacting on reliability.		7	6

		Reduction in collisions, in particular incidents involving pedestrians.	Option 4-6A is likely to lead to a reduction in the number of collisions compared with the current situation due to the significant increase in capacity.	Option 4-6C is also likely to lead to a reduction in the number of collisions due to the increase in capacity. The number of collisions is likely to be higher than Option 4-6A due to the higher risk of side swipes with narrow lanes but the severity index is likely to be lower due to the 50mph speed limit.	6	5
	Local Policy Alignment	Supporting more housing developments in the area and wider region	Option 4-6A is likely to provide more support to housing developments due to the greater capacity it offers and in particular higher travel speeds than Option 4-6C.	The scheme will increase capacity on the A1 NGWB and therefore support housing developments in the vicinity of the road and the wider region.	7	6
		Maintaining air quality with regard to European legal standards.	Poor air quality between Junctions 74 and 75 is predicted to exceed EU levels going forward. More freely flowing traffic may improve air quality, however this may be offset by increased traffic flows.	Poor air quality between Junctions 74 and 75 is predicted to exceed EU levels going forward. More freely flowing traffic may improve air quality, however this may be offset by increased traffic flows.	4	4
Meeting Intervention Objectives	Scheme Objectives Fit	Economic Growth and Development	Reduces delays and incidents impacting on reliability.	Reduces delays and incidents impacting on reliability but to a lesser extent than Option A.	7	6
		Movement of Goods and Access to Transport Hubs	The scheme will increase capacity and lead to fewer incidents and reduce delays which will enhance the role of the A1 NGWB corridor for moving goods. Will also improve access to Newcastle Airport.	The scheme will increase capacity and lead to fewer incidents and reduce delays which will enhance the role of the A1 NGWB corridor for moving goods. Will also improve access to Newcastle Airport.	6	6

		Accessibility	The increase in capacity the schemes provide along the A1 NGWB corridor will increase accessibility.		6	6
		Journey Times	Journey times will reduce due to the increase in capacity which will reduce the number of delays and incidents and therefore improve traffic flow.	The reduction in journey times in the peaks will not be as great as in Option A as the use of narrow lanes require a speed limit of 50mph compared to the 70mph speed limit of D3AP in Option A. Journey times outside peak times are likely to increase compared to the current situation due to the 50mph speed limit.	7	6
		Safety	Scheme designed to increase capacity and thereby reduce delays and safety issues. Impact of weaving on safety likely to be reduced due to provision of lane gain/lane drop arrangements.	The reduction in the number of collisions is unlikely to be as great with Option 4-6C due to the narrow lanes but the severity index will be lower due to the lower speed limit.	6	5
		Resilience	The increase in capacity is likely to lead to a reduction in accidents, improvements to journey times and reliability.	There is likely to be a reduction in the number of accidents but the impact is unlikely to be as great in Option 4-6A.	6	5
		Environment	More freely flowing traffic may improve air quality, however this may be offset by increased traffic flows. Scheme may result in noise increases in properties adjacent to A1 and other impacts on the local environment.	More freely flowing traffic may improve air quality, however this may be offset by increased traffic flows. Scheme may result in noise increases in properties adjacent to A1 and other impacts on the local environment.	3	3

		Deliverability	Acquisition of residential land, structures works at Junction 75 and bridge works are likely to lead to increased implementation timetable.	Structures works is minimal hence implementation timescale is less than Option A.	2	5

Option Assessment Framework (Value for Money)							
Options 4-6A & 4-6C: Scotswood to North Brunton							
Objective	**Sub-Objective**	**Qualitative Impacts**		**Quantitative Measures**		**Qualitative Score**	
		Option 4-6A	**Option 4-6C**	**Option 4-6A**	**Option 4-6C**	**Option 4-6A**	**Option 4-6C**
Economy	Business Users & Transport Providers	There will be journey time savings as a result of the increase in capacity which will reduce the number of incidents and delays and reduce average journey times. There will also be a reduction in vehicle operating costs due to less stop starting at congested times. Increasing the capacity on this section of the A1 NGWB will also lead to connectivity benefits for business users and freight through the improvement in linkages between locations of economic importance in the region.	There will be journey time and vehicle operating cost savings and connectivity benefits with Option C compared to the current situation. The improvements however will not be as great as in Option A due to the 50mph speed limit.	To be quantified in Stage 3.		7	6

	Reliability	The increase in capacity is likely lead to a reduction in the number of collisions and therefore delays.	The increase in capacity provided is likely to lead to an increase in reliability compared to the current situation but the number of collisions is likely to be greater than in Option A because of the use of narrow lanes.	None.	None.	7	6
	Regeneration	The scheme would increase capacity on a key corridor which will increase accessibility to jobs.	Option C is likely to have slightly less of an impact on regeneration than Option A as the increase in capacity provided is not as great.	None.	None.	7	6

Environment	Noise	On-line widening to D3AP likely to increase overall noise emissions due to decreasing congestion (free flowing traffic generally produces more noise), and likely marginal increase in road users on this segment. The spatial effects of widening (i.e. carriageway approaches closer to receptors) upon noise levels are likely to be negligible, except for properties located very close to the existing carriageway (i.e. within 7-8m).	On-line provision of narrow lanes likely to increase overall noise emissions due to decreasing congestion (free flowing traffic generally produces more noise), and likely marginal increase in road users on this segment. However, relative to Option 4-6A, noise emissions are likely to be lower due to reduced top-end speeds (50kph limit). The spatial effects of narrow lanes upon noise levels are likely to be negligible.	Population numbers affected will be similar to Option 4-6C, although with a smaller number also affected by spatial widening. It is not expected that the proposed intervention would increase noise levels by more than 3dB.	Population numbers affected will be similar to Option 4-6A. It is not expected that the proposed intervention would increase noise levels by more than 3dB.	3	3

	Air Quality	The proposed widening would result in an increase in carriage width by approximately 3.65m either side of the A1. There are existing residential dwellings within close proximity of the A1 along all sections between J74 and 79 (i.e. Sections 4 – 6). In some places the distance between the carriageway and the sensitive receptor is less than 10m and therefore any increase to the width of the carriageway has the potential to have a significant effect on local air quality. However, this will be partially offset by reduced congestion on the network and increase the ability of the traffic to flow more freely as a result of the proposed interventions, which would have positive benefits for local air quality.	The narrow lanes option would increase the road width by 1m either side of the carriageway. Due to the presence of existing residential properties within close proximity of the carriageway, there is the potential for significant effects on local air quality as a result of the proposed interventions. However, the significance of these effects is less than for Option 4-6A. This will, again, be partially offset by reduced congestion on the network and increase the ability of the traffic to flow more freely as a result of the proposed interventions, which would have positive benefits for local air quality.	None	None	4 Slight Beneficial to Slight Adverse (dependant on the success of the proposed interventions in reducing congestion and increasing the free flow of traffic)	4 Slight Beneficial to Neutral (dependant on the success of the proposed interventions in reducing congestion and increasing the free flow of traffic)

	Greenhouse Gases	Lane widening will result in an increase in traffic (and emissions), which may be partially offset by reduced emissions from free flowing traffic at 60-70mph	Lane widening will result in an increase in traffic (and emissions), which may be partially offset by reduced emissions from free flowing traffic at 50mph (lower emissions than at higher speeds)	None	None	3	3
	Landscape	The landscape character of Section 4-6 begins as urbanised and becomes increasing rural as the A1 corridor travels north. Section 4 has pockets of industrial character north of the Tyne but is mostly residential with areas of open space interspersed. Hadrian's Wall is located in this section which creates an historic character. Section 5 comprises of residential estates either side of the highly vegetated road corridor. Travelling north Section 6 becomes increasing more rural especially to the western side. Recreational facilities such as a golf course and race track lie to the east surrounded by woodland, farmland and residential areas. There are two areas of designated Green Belt in Section 4-6. One area lies east of Junction 77 and the second across open space north of Junction 78. Widening work incorporating land take would have a direct adverse impact upon the Green Belt. The A1 road corridor is lined with substantial tree belts through Section 4-6 particularly near residential areas. The removal of sections of this tree belt has the potential to adversely impact upon the landscape character of the section.		This option is likely to have a potential adverse impact upon designated Green Belt.	No	3	3

	Townscape	In relation to visual impact, given the proximity of residential properties, Green Belt and rural areas containing Public Rights of Way, the potential exists for adverse impacts upon all of these receptors. The following visual receptors have been identified • Residential areas to the east and west of the A1 corridor. • Various schools situated within the residential areas The removal of vegetation to enable widening is likely to have an adverse impact upon key vistas associated with Hadrian's Wall World Heritage Site and associated SMs There are key views from the public footpaths at Junction 74, Junction 77 and between Junctions 76-77 The removal of vegetation to enable the widening is likely to have a potentially slight to moderate adverse impact upon the identified visual receptors. The more contained option of narrow lanes to create the three lanes needed would limit the adverse impact upon visual receptors.	Important views are possible from residential areas including community buildings e.g. schools, the A1 may be visible from upper storeys of the properties. This option may have potential adverse impacts upon view to and from the Hadrian's Wall World Heritage Site	2	3

	Historic Environment	Historic mapping highlights that this area has developed from a rural landscape in the 1860's to one highly populated with residential and industrial properties in section 4. The residential estates were developed alongside a protected route left for the A1 corridor which was built and opened by 1990. The route crosses the World Heritage Site of Hadrian's Wall at Junction 75 within section 4. The designated area extends beyond the line of the wall in many locations and at Junction 75 it extends from the grade separated junction to approximately 200 metres south. Hence the southern slip roads are within the designated site. Approximately 100 metres to the west of the Junction is Denton Hall Turret – Hadrian's Wall. This is now located within a primarily residential area, where the road names, such as Centurion close, reflect the Heritage of the area. Six Grade II listed building are situated around Junction 74, two of which are approximately 600-700m east and four 650m to the west. One Grade II* listed building Lemington Cone is located approximately 1km to the west of Junction 74 Section 5 has no listed buildings within 2km and section 6 has just one Grade II listed building- Red House Farm 100m east of the A1 corridor.	This option may create potential large to moderate adverse impact upon the World Heritage site and associated SMs	This option is likely to have a potential adverse impact upon the World Heritage site and associated SMs	1	2

		Overall this option of full widening to dual 3 lanes with associated land take, is likely to have large adverse potential effect upon Hadrian's Wall designated as a World Heritage Site, in addition to its various associated SMs. Other listed buildings are unlikely to impacted upon due to their distance from the road corridor.	Overall the option of 3 narrow lanes through this section may have a potential moderate adverse effect upon Hadrian's Wall designated as a World Heritage Site in addition to its various associated SAMs. Other listed buildings are unlikely to be impacted upon due to their distance from the road corridor.				

	Biodiversity	Three areas of ancient woodland and two Local Nature Reserves (LNRs) are located either side of section 4. Denton Dene - both an Ancient woodland and LNR abuts the eastern carriageway of the A1 between Junction 74 and 75. Sugely Dene LNR is located 200m west of the A1 alongside two areas of ancient woodland. There are no designated sites in close proximity to the A1 corridor. It is likely that protected species such as Bats, Badgers and Great Crested Newts may be present in the area. The overall potential impact of widening is likely to be limited to the potential moderate adverse impact upon the ancient woodland and LNR from the removal of vegetation and extension of the carriageway. There may also be potential adverse impacts on protected species however further surveys would be needed to establish this.	The option of 3 narrow lanes may have a potential slight adverse impact upon Denton Dene ancient woodland and LNR	This option is likely to have a potential adverse impact upon both Denton Dene Ancient woodland and LNR	This option is likely to have a potential adverse impact upon Denton Dene ancient woodland and LNR	2	3
	Water Environment	There are various water courses within sections 4-6 including the River Tyne and Ouse Burn. Junctions 74 and 76 lie within flood zones 2 and 3 and are drainage hotspot.		0.8km flood zone 3 0.8km flood zone 2		3	3

Society Impact	Non-business users	There will be journey time savings as a result of the increase in capacity which will reduce the number of delays and increase average speeds.	The journey time savings are likely to be lower in Option C due to the lower speed limit than in Option A which will lead to longer journey times at less congested times.	To be quantified in Stage 3.		7	6
	Physical Activity	The scheme will have no impact on the number or length of walking or cycling trips.		None.	None.	4	4
	Journey Quality	The may be a small reduction in traveller stress due to fewer delays which may reduce frustration and the fear of being involved in an accident may also be reduced.		None.	None.	5	5
	Accidents	The scheme is likely to reduce the number of collisions due to the significant increase in capacity and the provision of lane gain/lane drop arrangements in weaving / merging sections	The reduction in collisions in Option C is not likely to be as great as in Option A but the severity index will be lower due to the lower speed limit.	To be quantified in Stage 3.		6	5
	Security	The scheme is unlikely to have any impact on the risk of crime.		None.	None.	4	4
	Access to Services	People will be “at least no worse off” as a result of the scheme.		None.	None.	4	4
	Affordability	Will result in a reduction in vehicle operating cost (VOC) as a result of reduced queuing.		None.	None.	5	5
	Severance	The scheme will have no impact on the routes used by pedestrians, cyclists and equestrians.		None.	None.	4	4

	Option Values	There is unlikely to be any impact on option values as a result of the scheme.		None.	None.	4	4
Public Accounts	Cost to Transport Budget	Total cost estimate (incl. preparation, supervision, land, works and optimism bias). Produced by HA Commercials team converted to PVC. Cost for acquisition of residential properties in Section 4 and structures works across all sections is expected to be very high.	Total cost estimate (incl. preparation, supervision, land, works and optimism bias). Produced by HA Commercials team converted to PVC.	£336m	£112m	N/A	N/A
	Indirect Tax Revenues	There may be a small reduction in indirect tax revenue due to the increased capacity which may lead to less start-stopping and therefore reduce fuel consumption.	The reduction in indirect tax revenues may be greater in Option C due to the lower speed limit (50mph) than in Option A (70mph) which may lead to lower levels of fuel consumption.	None.	None.	3	3
Indicative Benefit Cost Ratio	Cost to Private Sector	Zero.		Zero.	Zero.	N/A	N/A
	Indicative Net Present Value	Not calculated.	Not calculated.	To be quantified in Stage 3.		N/A	N/A
	Indicative BCR	Not calculated at this stage. Likely very high costs of works in Section 4.	Not calculated at this stage.	To be quantified in Stage 3.		Low: BCR = 1-1.5	High: BCR = 2-4.

Option Assessment Framework (Financial Case)							
Options 4-6A & 4-6C: Scotswood to North Brunton							
Assessment Area	**Category**	**Qualitative Impacts**		**Quantitative Measures**		**Qualitative Score**	
		Option 4-6A	**Option 4-6C**	**Option 4-6A**	**Option 4-6C**	**Option 4-6A**	**Option 4-6C**
Capital and Revenue Costs	Outturn cost to implement	Total cost estimate (incl. preparation, supervision, land, works and optimism bias). Produced by HA Commercials team.	Total cost estimate (incl. preparation, supervision, land, works and optimism bias). Produced by HA Commercials team.	£490m	£157m	N/A	N/A
	Operating and Maintenance Costs	Likely increase in maintenance costs due to additional road infrastructure	Likely increase in maintenance costs due to additional road infrastructure. Will be less than Option 4-6A as less widening is involved	N/A	N/A	2	3
Funding Assumptions	Funding Allocation	The scheme would be funded by Central Government.				N/A	N/A

Option Assessment Framework (Delivery Case)						
Options 4-6A & 4-6C: Scotswood to North Brunton						
Assessment Area	**Qualitative Impacts**		**Quantitative Measures**		**Qualitative Score**	
	Option 4-6A	**Option 4-6C**	**Option 4-6A**	**Option 4-6C**	**Option 4-6A**	**Option 4-6C**
Likely Delivery Agents	Delivery agent is the Highways Agency.		None.	None.	6	6
Stakeholder Acceptability	General consensus of stakeholders over need for interventions.		None.	None.	6	6
Public Acceptability/ Interest	Requirement to acquire residential land in Section 4 likely to require extensive public consultation.	Public acceptability not likely to be a major issue.	None.	None.	3	5

Option Assessment Framework (Commercial Case)						
Options 4-6A & 4-6C: Scotswood to North Brunton						
Assessment Area	**Qualitative Impacts**		**Quantitative Measures**		**Qualitative Score**	
	Option 4-6A	**Option 4-6C**	**Option 4-6A**	**Option 4-6C**	**Option 4-6A**	**Option 4-6C**
Route to Market	Scheme to be financed by Central Government. There is unlikely to be any great difficulty or risk in construction of either scheme other than adjustments to structures in Option A.		None.	None.	4	6

Option Implementation of Technology: Birtley to Coalhouse and Metrocentre to Seaton Burn

Note that, where applicable, the guidance within Interim Advice Note 160/12: Appraisal of Technology Schemes has been used to complete this section.

This option includes the following technology for the whole route:

- CCTV cameras
- MIDAS system
- Variable Message Signs (VMS)

Option Assessment Framework (Strategic Fit)				
Implementation of Technology: Birtley to Coalhouse and Metrocentre to Seaton Burn				
Assessment Area	**Category**	**Objective**	**Qualitative Impacts**	**Qualitative Score**
Regional Transport and Spatial Strategy	Regional Policy Alignment	Improve Economic Performance of Region	Fits with wider national, regional and local policies that consider that improvements to A1 NGWB are fundamental to the economic performance of the region.	5
		‘Doing more with less’	Good example of 'doing more with less' as aims to use existing highway as efficiently as possible.	7

		Maintain and improve accessibility to jobs, housing and key services	Better management of the route helps to reduce the impact of incidents and therefore maintain accessibility	5
		Reduction in the variability of journey times along the corridor	Better management of the route especially when incidents occur reduces day to day journey time variations	5
		Reduction in collisions, in particular incidents involving pedestrians.	Opportunity to divert traffic off the network when incidents occur may reduce the likelihood of further collisions and incidents involving pedestrians getting out of broken down vehicles	5
	Local Policy Alignment	Supporting more housing developments in the area and wider region	Scheme doesn't significantly affect capacity and therefore doesn't provide for additional traffic generated by housing developments	4
		Maintaining air quality with regard to European legal standards.	Scheme unlikely to significantly affect air quality though may lead to slightly more free flowing traffic	4
Meeting Intervention Objectives	Scheme Objectives Fit	Economic Growth and Development	Through better management of existing route will improve journey time reliability which assists with economic growth of the region	5
		Movement of Goods and Access to Transport Hubs	Through better management of existing route will improve journey time reliability which assists with movement of goods and access to transport hubs	5
		Accessibility	Better management of the route helps to reduce the impact of incidents and therefore maintain accessibility	5

		Journey Times	Better management of the route especially when incidents occur reduces day to day journey time variations	5
		Safety	Opportunity to divert traffic off the network when incidents occur may reduce the likelihood of further collisions and incidents involving pedestrians getting out of broken down vehicles. Guidance indicates that MIDAS + CCTV system can reduce accidents by around 13%	6
		Resilience	Opportunity to manage and divert traffic off the network when incidents occur will reduce impact of incidents	6
		Environment	Scheme unlikely to significantly affect environment though may lead to slightly more free flowing traffic and therefore some minor benefits	5
		Deliverability	For scheme to work effectively it would need to be installed over a significant length of the route but doesn't involve major engineering works.	3

Option Assessment Framework (Value for Money)				
Implementation of Technology: Birtley to Coalhouse and Metrocentre to Seaton Burn				
Objective	**Sub-Objective**	**Qualitative Impacts**	**Quantitative Measures**	**Qualitative Score**
Economy	Business Users & Transport Providers	Business users will benefit from reduced delays and reduced vehicle operating costs as a result of fewer accidents and possible reductions in incident durations.	None	5

	Reliability	Drivers will benefit from a reduction in incident-related variability which results from the reduction in the number of accidents and possible reductions in incident durations.	None	5
	Regeneration	No impact likely on regeneration	None	4
Environment	Noise	The use of technologies along Sections 1 – 7 of the A1 will result in a reduction in overall accident rates and/or incident durations and hence congestion at these times. The net effect of this could be a slight average increase in noise levels, but below thresholds likely to be perceptible. However, controlled motorways also have the effect of reducing driving speeds at the top end, which would reduce noise levels for free flowing traffic. There may be complex interactions between the effects of different technology schemes, depending on the final mix selected. However, the effects of all upon noise are likely to be minimal.	Research indicates that the effect of technologies upon noise is normally below thresholds normally considered perceptible (TRL, 2004).	4

	Air Quality	The main benefit of using technologies along Sections 1 – 7 of the A1 will be a reduction in accident rates and/or incident durations. This will reduce the frequency and duration of congestion on the network as a result of incidents, which will have benefits for local air quality. Interim Advice Note 160/12 states that both CCTV and MIDAS would have no impact on traffic volume or average speeds but that less stop/start traffic queuing at accidents should have a positive effect on local air quality. VMS will also help by ensuring more constant vehicle speeds (i.e. less acceleration and deceleration) which should result in a positive effect on local air quality. Any changes in local air quality will affect sensitive receptors within 200m of the A1 carriageway. A review of detailed mapping indicates that there are a large number of existing residential dwellings within 200m of the A1 carriageway and a number of schools (i.e. high sensitivity receptors).	None	4
	Greenhouse Gases	Through the effective implementation of technology (e.g. Variable Message Signs, CCTV) CO2 emissions should be reduced through a combination of (i) more constant vehicle speeds (less acceleration and deceleration), (ii) less flow breakdown and (iii) fewer vehicles travelling at speeds in excess of the speed limit. Less stop/start traffic from queuing at accidents should also have positive effect.	None	5

	Landscape	The A1 route passes through two separate landscape Character Areas. In broad terms, open, agricultural landscapes prevail from the scheme commencement. The corridor then becomes more constrained up to a large interchange at Crowther, before becoming more rural as it passes the Angel of the North. The corridor is then highly urbanised as it passes the Team Valley Estate and the Metrocentre, before passing over the Tyne and continuing through urban areas, albeit more residential than to the south of the river. The corridor then becomes more rural at its northern end, passing the racecourse and golf courses. Residential areas remain however, but they are set back from the line of the road. Numerous areas of Green belt also adjoin the corridor and the route of the A1/A1M itself passes through five designated Green belt areas. The introduction of technology measures into the green belt may result in a potential slight adverse impact on the Green belt if not appropriately designed and positioned. In addition, the introduction of technology measures may have a limited potential adverse impact upon the character of the landscape. As the current A1 dominants the landscape, additional signage etc within the highway verges would have little impact.	This option is likely to have a slight potential adverse impact upon various area of green belt throughout the length of Sections 1-7	3

	Townscape	In relation to visual impact, given the proximity of residential properties, Green Belt and rural areas containing Public Rights of Way, the potential exists for adverse impacts upon all of these receptors. The introduction of technology measures into views may cause a potential adverse impact on surrounding receptors if not appropriately designed and positioned.	Important views are possible from residential areas including community buildings eg schools, along the entire length of Section 1-7 the A1 and any additional technology measures may be visible from upper storeys of the properties. There are potential adverse impacts upon views to and from the Angel of the North. There are potential adverse impacts upon view to and from the Hadrian's Wall World Heritage Site.	3

	Historic Environment	The route crosses the World Heritage Site of Hadrian's Wall at Junction 75 within section 4. The designated area extends beyond the line of the wall in many locations, and at J75, it extends from the grade separated junction to approximately 200 metres south. Hence the southern slip roads are within the Designated Site. Approximately 100 metres to the west of the Junction is Denton Hall Turret – Hadrian's Wall. This is now located within a primarily residential area, where the road names, such as Centurion Close, reflect the Heritage of the area. The well-known Angel of the North lies 100 metres north east of the A1 within section 1, immediately north of the A1's junction with the A167. These are the major Heritage assets within the corridor. There are also several Scheduled Monuments, two of which adjoin the route: • East of the A1M, approximately 1km north of the route commencement at Carville; and • West of the route, the opposite side of the corridor from Team Valley Trading Estate. The introduction of technology measures through section 1-7 may cause a potential slight to moderate adverse impact on surrounding historic receptors, especially the world heritage site if not appropriately designed and positioned.	This option is likely to have a potential adverse impact upon the world Heritage of Hadrian's Wall	3

	Biodiversity	There are no National Nature Reserves along the route; however several Local Nature reserves adjoin the highway boundary, primarily to locations north and south of the river Tyne. One SSSI abuts the highway boundary on the west side, immediately north of the Swalwell interchange, (A1/A694), within Section 2 approximately 1km south of the A1 crossing the Tyne. There are relatively few Ancient Woodlands along the corridor, however some are very close to or abut the A1. Given the extent of the option and its spreading across all sections, it is likely that protected species such as Bats, Badgers and Great Crested Newts may be present in the area. The overall potential impact is likely to be limited to slight adverse to the ancient woodland at Junction 66 and the SSSI, although there is also the potential to adversely impact upon protected species. Further survey work would be needed to establish this potential impact.	This option is likely to potentially adversely impact upon the area of ancient woodland that abuts the A1 at Junction 66 and an area of SSSI within Section 2	3
	Water Environment	In addition to the Tyne crossing, the route crosses three locations with a 'High' risk of flooding. Potential impacts of solutions on these, and other catchments, and early agreement of acceptable solutions with the EA, may be a key element in relation to scheme programming.	2.2km flood zone 3 1.7km flood zone 2	3
Society Impact	Non-business users	Non-business users will benefit from reduced delays and reduced vehicle operating costs as a result of fewer accidents and possible reductions in incident durations.	None	5
	Physical Activity	No impact on physical activity	None	4
	Journey Quality	Potential improvement in the provision of en-route general travel information. Such improvements would result in an increase in Traveller Care.	None	5

	Accidents	Scheme likely to reduce the number of accidents	Guidance suggests 13% reduction in accidents with MIDAS + CCTV system	6
	Security	Users will experience an improved level of formal surveillance due to the introduction of CCTV	None	5
	Access to Services	No impact on access to services	None	4
	Affordability	Will result in a reduction in vehicle operating cost (VOC) as a result of reduced queuing at accidents.	None	5
	Severance	No impact on severance	None	4
	Option Values	No impact on option values	None	4
Public Accounts	Cost to Transport Budget	Total cost estimate (incl. preparation, supervision, land, works and optimism bias). Produced by HA Commercials team converted to PVC.	£134m	N/A
	Indirect Tax Revenues	Very slight reduction in indirect tax revenues due to reduction in fuel use as a result of reduced queuing at accidents	None.	3
Indicative Benefit Cost	Cost to Private Sector	Zero.	Zero.	N/A

Ratio	Indicative Net Present Value	Not calculated, difficult to quantify benefits.	To be quantified in Stage 3.	N/A
	Indicative BCR	Not calculated, difficult to quantify benefits.	To be quantified in Stage 3.	Medium: BCR = 1.5-2.

Option Assessment Framework (Financial Case)				
Implementation of Technology: Birtley to Coalhouse and Metrocentre to Seaton Burn				
Assessment Area	**Category**	**Qualitative Impacts**	**Quantitative Measures**	**Qualitative Score**
Capital and Revenue Costs	Outturn cost to implement	Total cost estimate (incl. preparation, supervision, land, works and optimism bias). Produced by HA Commercials team.	£193m	N/A
	Operating and Maintenance Costs	No maintenance cost is anticipated before installation of the technology. Equipment typically needs to be renewed every 15 years.	N/A	3
Funding Assumptions	Funding Allocation	The scheme would be funded by Central Government.		N/A

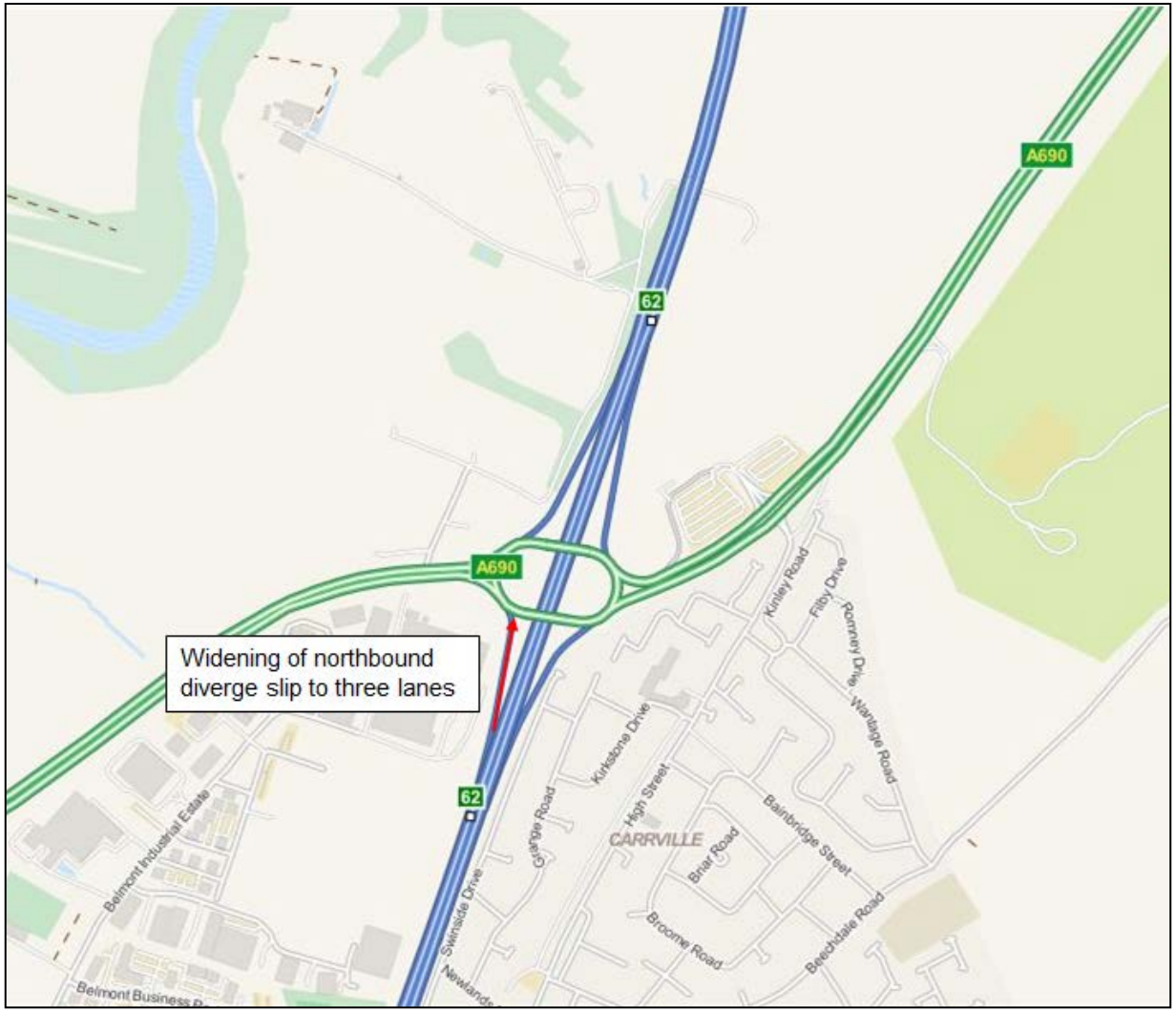
Option Assessment Framework (Delivery Case)			
Implementation of Technology: Birtley to Coalhouse and Metrocentre to Seaton Burn			
Assessment Area	**Qualitative Impacts**	**Quantitative Measures**	**Qualitative Score**
Likely Delivery Agents	Scheme has a short time frame as no major highways works are required and it is a relatively easy to install this system. Delivery agent would be the Highways Agency	None.	6
Stakeholder Acceptability	There is a general consensus of stakeholders over need for interventions.	None.	6
Public Acceptability/ Interest	Public acceptability not likely to be a major issue.	None.	5

Option Assessment Framework (Commercial Case)			
Implementation of Technology: Birtley to Coalhouse and Metrocentre to Seaton Burn			
Assessment Area	**Qualitative Impacts**	**Quantitative Measures**	**Qualitative Score**
Route to Market	Scheme to be financed by Central Government. There is unlikely to be any great difficulty or risk in construction of scheme.	None.	6

Appendix D

Options Assessment Framework Output – Junction Intervention Schemes

Junction 62: Widening of northbound diverge slip to three lanes



Option Assessment Framework (Strategic Fit)				
Junction 62: Widening of northbound diverge slip to three lanes				
Assessment Area	**Category**	**Objective**	**Qualitative Impacts**	**Qualitative Score**
Regional Transport and Spatial Strategy	Regional Policy Alignment	Improve Economic Performance of Region	Fits with wider national, regional and local policies that consider that improvements to A1 NGWB are fundamental to the economic performance of the region.	4
		‘Doing more with less’	Attempt at 'doing more with less' but the level of benefits will be limited by the relatively small scale of the scheme.	4
		Maintain and improve accessibility to jobs, housing and key services	The scheme is unlikely to impact on accessibility.	4
		Reduction in the variability of journey times along the corridor	The scheme should prevent queues developing from Junction 62 back on to the A1 mainline which will reduce delays and improve reliability.	5
		Reduction in collisions, in particular incidents involving pedestrians.	The scheme may lead to a small reduction in the likelihood of a collision.	4
	Local Policy Alignment	Supporting more housing developments in the area and wider region	The scheme is unlikely to impact on housing developments in the area or wider region.	4
		Maintaining air quality with regard to European legal standards.	More freely flowing traffic may lead to a small improvement in air quality.	4

Meeting Intervention Objectives	Scheme Objectives Fit	Economic Growth and Development	The scheme is likely to have a positive impact on economic growth.	5
		Movement of Goods and Access to Transport Hubs	The scheme will reduce the likelihood of queues forming back from Junction 62 on to the A1 mainline leading to reduced delays for traffic using the A1.	5
		Accessibility	The scheme is unlikely to impact on accessibility.	4
		Journey Times	The increase in capacity will prevent queues from Junction 62 back on to the A1 mainline which will reduce delays leading to improved journey times at congested times.	5
		Safety	The scheme may lead to a slight reduction in the risk of a collision.	4
		Resilience	Extending the diverge slip roads to 3 lanes will reduce the likelihood of queues forming back from Junction 62 on to the A1 mainline which will improve the resilience of the network.	5
		Environment	More freely flowing traffic may improve air quality, however this may be offset by increased traffic flows. Scheme may have a slight adverse impact on the built and natural environment.	3
		Deliverability	Small scale should be delivered quite quickly.	7

Option Assessment Framework (Value for Money)				
Junction 62: Widening of northbound diverge slip to three lanes				
Objective	**Sub-Objective**	**Qualitative Impacts**	**Quantitative Measures**	**Qualitative Score**
Economy	Business Users & Transport Providers	Journey times will improve and vehicle operating costs will be reduced due to higher travel speeds for users travelling at congested times. The increase in capacity will also reduce delays which will improve reliability.	None.	5
	Reliability	Reduces delays impacting on reliability at congested times.	None.	5
	Regeneration	This scheme is unlikely to have a significant impact on regeneration.	None.	4
Environment	Noise	On-line widening of the northbound exit slip road to the A1(M) at J62 is likely to increase overall emissions from this road segment due to decreasing congestion at busy times (free flowing traffic generally produces more noise), and a resulting, potential increase in road users. Depending upon the level of the attendant reductions to congestion on the main A1(M) carriageway, the intervention may increase noise emissions from this road segment also. The size of the effect will vary by time of day, and will be most apparent during particularly congested periods in the existing baseline scenario. The spatial effects of widening (i.e. the decrease in noise levels due to the increased distance between the dwellings and the effective noise centreline of the slip road) are likely to be wholly masked by noise on the main A1(M) carriageway and existing slip road. The nearest residential areas are some 100m to the east and unlikely to experience any measurable increase in noise as a result of the spatial effects of widening.	Sizeable population potentially affected (west environs of Carville). However, it is not expected that the proposed intervention (either on its own or cumulatively with proposed interventions on the main A1/A1(M) carriageway) would increase noise levels at any receptor by more than 3dB.	3

	Air Quality	The proposed widening would increase the width of the slip road by up to 3.65m and result in a small number of commercial / industrial properties being located closer to this section of carriageway, which could experience a slight worsening in air quality. However, only short-term objectives would apply at these locations and exceedences of Air Quality Strategy (AQS) objectives are considered unlikely. In addition, DMRB guidance (Volume 11 Section 3 Part 1 HA 207/07) states that changes in road alignment of less than 5m result in an insignificant change in local air quality, and therefore the change is considered to be neutral. The proposed widening would increase the distance of the centre of the slip road carriageway to residential properties located within 200m to the east, albeit by an insignificant distance. None of these properties are within 50m of the slip road and given that pollution concentrations decrease rapidly with distance from source, any improvements are likely to be imperceptible, and the change in air quality will be neutral. These residential properties are located within approximately 30m of the main carriageway of the A1 and as the proposed intervention aims to reduce congestion on the network and increase the free flow of traffic, this should have positive benefits for local air quality within the immediate vicinity of this section of the A1.	None.	4
	Greenhouse Gases	The proposed widening would increase the width of the slip road by up to 3.65m and would ease congestion of traffic leaving the A1. A reduction in queuing allows more constant vehicle speeds and limits stop/start traffic - having a beneficial effect on GHG emissions. Whilst increased flow could affect the number of vehicles travelling at speeds in excess of the speed limit this is not expected to be an issue here as the slip road is on the approach to a junction.	N/A	5

	Landscape	In broad terms the landscape character of the area around Junction 62 is largely rural to the north with large field patterns and urban with residential properties to the south east and an industrial area to the south west. The rural setting to the north adjacent to the junction is designated Green Belt. The removal any of this vegetation to facilitate the works may have a slight adverse impact on the character of the area and the Green Belt.	This option may have a potential slight impact upon the setting of the designated Green Belt.	3
	Townscape	Urban development is limited to the south of Junction 66 the following visual receptors have been identified ■ Residential area to the south	Important views are possible from residential areas including community buildings eg schools, the A1 may be visible from upper storeys of the properties.	3
	Historic Environment	Historic maps illustrate the development of the area from an entirely rural landscape with a prominent railways line to a mixed landscape. The northern rural setting has continued from the 1800s to present day. The southern area has developed since the 1920's through the 1960's into Carrville residential area, in the 1990 the A1 and A690 were being planned and constructed. There are no Listed Buildings, Scheduled Monuments or other historic designations in this area.	Does the option impact on a designated site (Grade I and II*, WHS, SM, Registered Park or Garden, Conservation Areas): No.	4
	Biodiversity	There is an Ancient woodland – Frankland wood 700m north of Junction 62 Protected species such as Bats, Badgers and Great Crested Newts may also be present in the area. The overall effect is likely to be limited upon the Ancient Woodland due to the distance from the works. There may also be potential impacts on protected species, however further surveys would be needed to establish this.	This option is likely to have limited potential impact upon the Ancient Woodland at Junction 62	3

	Water Environment	There are no water courses or Flood Zone in close proximately to the Junction. The River Wear lies some 600m west of Junction 62.	Flood Zone 3b- 0m Flood Zone 2 -0m	4
Society Impact	Non-business users	Journey times will improve and vehicle operating costs will be reduced for users travelling at congested times. The increase in capacity should reduce the number of incidents and delays and lead to an increase in reliability.	None.	5
	Physical Activity	The scheme will have no impact on the number or length of walking or cycling trips.	None.	4
	Journey Quality	There may be a small reduction in traveller stress due to fewer delays which may reduce frustration and the fear of being involved in an accident may also be reduced.	None.	4
	Accidents	The scheme may lead to a slight reduction in the risk of a collision.	None.	4
	Security	The scheme is unlikely to have any impact on the risk of crime.	None.	4
	Access to Services	People will be “at least no worse off” as a result of the scheme.	None.	4
	Affordability	There could be a small reduction in vehicle operating cost (VOC) as a result of reduced queuing.	None.	5
	Severance	The scheme will have no impact on the routes used by pedestrians, cyclists and equestrians.	None.	4
	Option Values	There is unlikely to be any impact on option values as a result of the scheme.	None.	4

Public Accounts	Cost to Transport Budget	Total cost estimate (incl. preparation, supervision, land, works and optimism bias). Produced by HA Commercials team converted to PVC.	£0.93m	N/A
	Indirect Tax Revenues	There may be a small reduction in indirect tax revenue due to the increased capacity which may lead to less start-stopping and therefore reduce fuel consumption.	None.	3
Indicative Benefit Cost Ratio	Cost to Private Sector	Zero.	Zero.	N/A
	Indicative Net Present Value	Not calculated at this stage.	None.	N/A
	Indicative BCR	Not calculated at this stage.	None.	Medium: BCR = 1.5-2.

Option Assessment Framework (Financial Case)				
Junction 62: Widening of northbound diverge slip to three lanes				
Assessment Area	**Category**	**Qualitative Impacts**	**Quantitative Measures**	**Qualitative Score**
Capital and Revenue	Outturn cost to implement	Total cost estimate (incl. preparation, supervision, land, works and optimism bias). Produced by HA Commercials team.	£1.28m	N/A

Costs	Operating and Maintenance Costs		N/A	4
Funding Assumptions	Funding Allocation	The scheme would be funded by Central Government.	None.	N/A

Option Assessment Framework (Delivery Case)			
Junction 62: Widening of northbound diverge slip to three lanes			
Assessment Area	**Qualitative Impacts**	**Quantitative Measures**	**Qualitative Score**
Likely Delivery Agents	Highways Agency will be the delivery agents.	None	6
Stakeholder Acceptability	There is a general consensus of stakeholders over need for interventions.	None	6
Public Acceptability / Interest	Public acceptability not likely to be a major issue.	None	6

Option Assessment Framework (Commercial Case)			
Junction 62: Widening of northbound diverge slip to three lanes			
Assessment Area	**Qualitative Impacts**	**Quantitative Measures**	**Qualitative Score**
Route to Market	Scheme to be financed by Central Government. There is unlikely to be any great difficulty or risk in construction of the scheme.	None	6

Junction 65: Extend existing three lanes at approach to stop/give way line on the southbound diverge slip onto A1231

Option Assessment Framework (Strategic Fit)				
Junction 65: Extend existing three lanes at approach to stop/give way line on the southbound diverge slip onto A1231				
Assessment Area	**Category**	**Objective**	**Qualitative Impacts**	**Qualitative Score**
Regional Transport and Spatial Strategy	Regional Policy Alignment	Improve Economic Performance of Region	Fits with wider national, regional and local policies that consider that improvements to A1 NGWB are fundamental to the economic performance of the region.	4
		'Doing more with less'	Attempt at 'doing more with less' but the level of benefits will be limited by the relatively small scale of the scheme.	4
		Maintain and improve accessibility to jobs, housing and key services	Improves linkages between A1 NWGB corridor and Sunderland, Washington and South Tyneside.	5
		Reduction in the variability of journey times along the corridor	The scheme should prevent queues developing from Junction 65 back on to the A1 mainline which will reduce delays and improve reliability.	5
		Reduction in collisions, in particular incidents involving pedestrians.	There may be a slight reduction in the number of accidents.	4
	Local Policy Alignment	Supporting more housing developments in the area and wider region	The scheme is unlikely to impact on housing developments in the area or wider region.	4
		Maintaining air quality with regard to European legal standards.	More freely flowing traffic may lead to a small improvement in air quality.	4

Meeting Intervention Objectives	Scheme Objectives Fit	Economic Growth and Development	The scheme will reduce delays and potential for incidents impacting on reliability. The scheme also improves access to employment centres along the A1 NGWB corridor from Sunderland, Washington and South Tyneside. Overall impacts is likely to be relatively small.	5
		Movement of Goods and Access to Transport Hubs	The scheme will reduce the likelihood of queues forming back from Junction 65 onto the A1 mainline leading to reduced delays for traffic using the A1.	5
		Accessibility	The scheme may slightly improve accessibility to employment in Team Valley and other employment centres along the A1 NGWB corridor to/from Sunderland, Washington and South Tyneside.	5
		Journey Times	The increase in capacity will prevent queues from Junction 79 back onto the A1 mainline which will reduce delays leading to improved journey times at congested times.	5
		Safety	The scheme may lead to a slight reduction in the risk of a collision.	4
		Resilience	Extending the diverge slip roads to 3 lanes will reduce the likelihood of queues forming back from Junction 65 onto the A1 mainline which will improve the resilience of the network.	5
		Environment	More freely flowing traffic may improve air quality and reduce carbon emissions. Scheme may have a slight adverse impact on the built and natural environment.	3
		Deliverability	Small scale scheme could be delivered in short time frame and should be feasible barring unforeseen constraints.	7
Option Assessment Framework (Value for Money)				
Junction 65: Extend existing three lanes at approach to stop/give way line on the southbound diverge slip onto A1231				

Objective	Sub-Objective	Qualitative Impacts	Quantitative Measures	Qualitative Score
Economy	Business Users & Transport Providers	The scheme will reduce the likelihood of queues forming back from Junction 65 onto the A1 mainline which will reduce journey times and vehicle operating costs and improve reliability at congested times. There may also be some connectivity benefits as the scheme will improve linkages between Sunderland, Washington and South Tyneside and locations of economic importance along the A1 NGWB.	None.	5
	Reliability	Reduces delays and incidents impacting on reliability particularly at congested times.	None.	5
	Regeneration	This scheme is unlikely to have a significant impact on regeneration.	None.	4
Environment	Noise	On-line widening of the A1(M) to A1231 slip road at J65 is likely to increase overall emissions from this road segment due to decreasing congestion at busy times (free flowing traffic generally produces more noise), and a resulting, potential increase in road users. Depending upon the level of the attendant reductions to congestion on the main A1(M) and/or A1231 carriageways and existing slip roads / roundabouts at the junction, the intervention may increase noise emissions from these road segments also. The size of the effect will vary by time of day, and will be most apparent during particularly congested periods in the existing baseline scenario. The spatial effects of widening (i.e. the increase in noise levels due to the decreased distance between the dwellings and the effective noise centreline of the slip road) are likely to be wholly masked by noise on the main A1(M) and A1231 carriageways and existing slip roads / roundabouts at the junction. The nearest residential areas are some 50m to the south (Northside/The Brambles), and unlikely to experience any measurable increase in noise as a result of the spatial effects of widening.	Sizeable population potentially affected (eastern environs of Birtley). However, it is not expected that the proposed intervention(either on its own or cumulatively with proposed interventions on the main A1/A1(M) carriageway) would increase noise levels at any receptor by more than 3dB.	3

	Air Quality	The proposed widening would result in an increase in the carriageway widths by up to 3.65m; although this reduces the distance between the carriageway and sensitive receptors, as the change is less than 5m it is unlikely to bring about a significant change in local air quality. A review of detailed mapping in the vicinity of the A1 indicates that within 200m of the slip road widening there are a small number of residential properties to the south the A1 in Birtley (e.g. on Northside and The Brambles). There are also two properties which may also be residential (The Mill House and Fox Pond Kennels) located approximately 120m and 75m from the widening of the approach to the B1288 and A1231 roundabout. All of the residential properties described above are greater than 50m from the edge of the road widening and given that pollution concentrations decrease rapidly with distance from source, any direct effects on air quality due to changes in flow or speed are considered unlikely to be significant at these properties. Furthermore, the proposed interventions aim to help reduce congestion on the network and aid the free flow of traffic which would have positive benefits for local air quality.	None.	4
	Greenhouse Gases	The proposed widening would increase the width of the slip road by up to 3.65m and would ease congestion of traffic leaving the A1. A reduction in queuing allows more constant vehicle speeds and limits stop/start traffic - having a beneficial effect on GHG emissions. Whilst increased flow could affect the number of vehicles travelling at speeds in excess of the speed limit this is not expected to be an issue here as the slip road is on the approach to a junction.	None	5

	Landscape	In broad terms the landscape character of the area around Junction 65 is largely rural with large field patterns and intermittent, individual properties. An urban area of residential properties lies to the south of Junction 65. Designated Green Belt is situated to the north, adjacent to the A1, north of Junction 65 Sustrans route 11 passes underneath the A1M south of Junction 65. Works to Junction 65 have implications on the Sustrans route. The removal of any vegetation around the junction to facilitate the works may have a slight adverse impact on the character of the area and the Green Belt.	This option may have a potential slight impact upon the setting of the designated Green Belt and the Sustrans route 11	3
	Townscape	Urban development is limited to the south of Junction 65. The following visual receptors have been identified ■ Residential area to the south of Junction 65 ■ St Joseph's RC Primary school, 100m south, situated between junctions 65-66 The removal of any vegetation to facilitate the works may cause a slight adverse impact upon the identified visual receptors.	Important views are possible from residential areas including community buildings eg schools, the A1 may be visible from upper storeys of the properties.	3

	Historic Environment	Historic maps illustrate the development of the area from a rural landscape dotted with small villages to one that is still largely rural but built up with large residential and industrial areas along the railway line There are three Grade II Listed Buildings and one Scheduled Monument (SM) situated less than 1km from the proposed option. All of these may potentially be adversely affected. There are no Grade I or II* buildings. ■ Three Grade II Listed Building are situated some 800m to the south of Junction 65 - St Johns Church, A School House and Em Perkins Statue. Overall this option is likely to have little potential effect upon the Listed Buildings in the area due to their distance from the A1	Does the option impact on a designated site (Grade I and II*, WHS, SM, Registered Park or Garden, Conservation Areas): No	3
	Biodiversity	There are no designated area around the junction, although it is likely that protected species such as Bats, Badgers and Great Crested Newts maybe be present in the area. The overall effect is likely to be limited, there may be potential impacts on protected species, however further surveys would be needed to establish this.	Does the option impact on a designated site (Ramsar, SPA, SAC, SSSI, CWS, SINC): No	3
	Water Environment	There are no water courses or Flood Zone in close proximately to the Junction	Flood Zone 3b- 0m Flood Zone 2 -0m	4
Society Impact	Non-business users	The scheme will reduce the likelihood of queues forming back from Junction 65 onto the A1 mainline which will reduce journey times and vehicle operating costs. The increase in capacity should reduce the number of incidents and delays and lead to an increase in reliability.	None.	5
	Physical Activity	The scheme will have no impact on the number or length of walking or cycling trips.	None.	4

	Journey Quality	There may be a small reduction in traveller stress due to fewer delays which may reduce frustration and the fear of being involved in an accident may also be reduced.	None.	4
	Accidents	The scheme may lead to a slight reduction in the risk of a collision.	None.	4
	Security	The scheme is unlikely to have any impact on the risk of crime.	None.	4
	Access to Services	People will be “at least no worse off” as a result of the scheme.	None.	4
	Affordability	There could be a small reduction in vehicle operating cost (VOC) as a result of reduced queuing.	None.	5
	Severance	The scheme will have no impact on the routes used by pedestrians, cyclists and equestrians.	None.	4
	Option Values	There is unlikely to be any impact on option values as a result of the scheme.	None.	4
Public Accounts	Cost to Transport Budget	Total cost estimate (incl. preparation, supervision, land, works and optimism bias). Produced by HA Commercials team converted to PVC.	£1.39m	N/A
	Indirect Tax Revenues	There may be a small reduction in indirect tax revenue due to the increased capacity which may lead to less start-stopping and therefore reduce fuel consumption.	None.	3
Indicative Benefit Cost Ratio	Cost to Private Sector	Zero.	Zero.	N/A

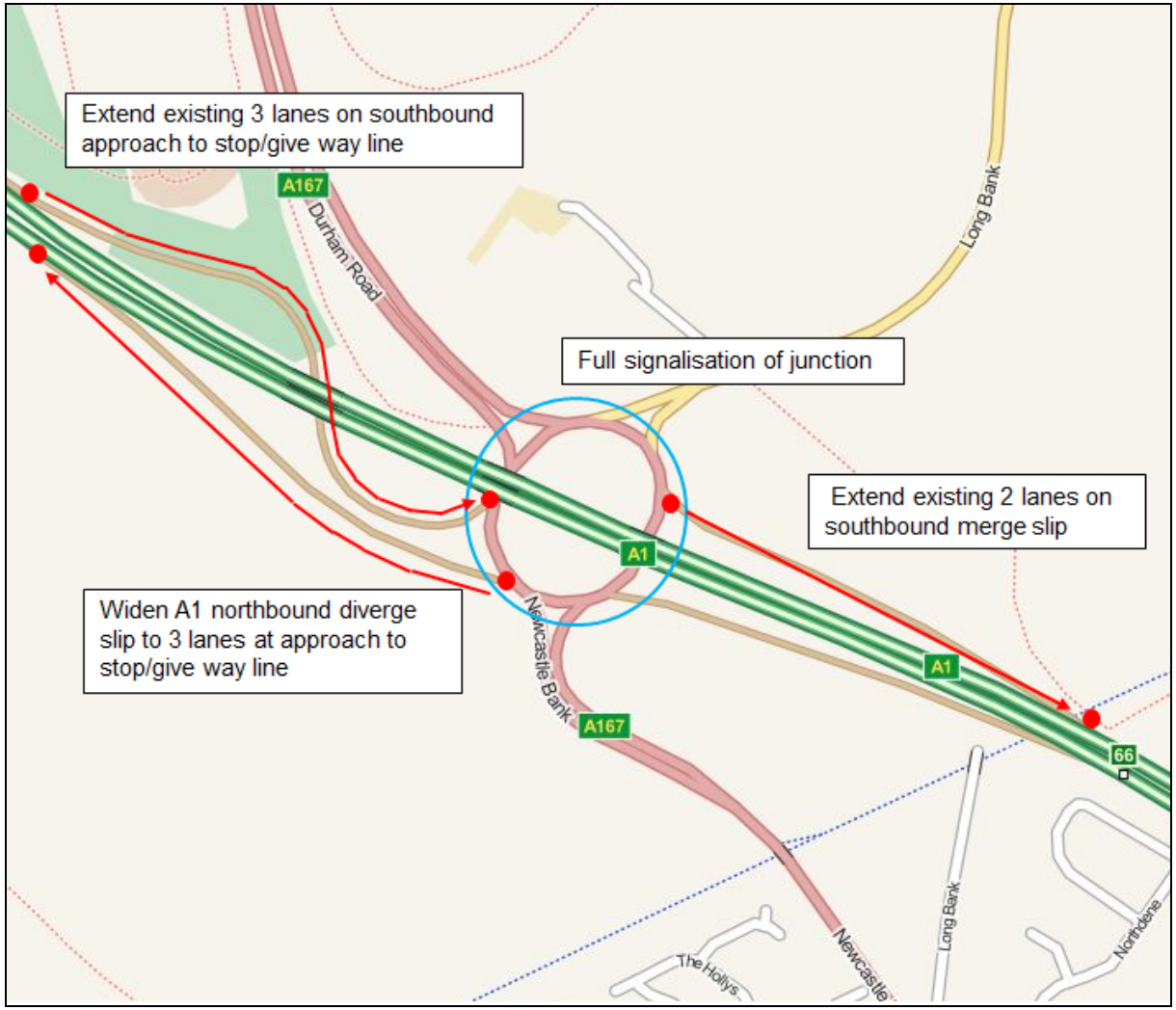
	Indicative Net Present Value	Not calculated at this stage.	None.	N/A
	Indicative BCR	Not calculated at this stage.	None.	High: BCR = 2-4.

Option Assessment Framework (Financial Case)				
Junction 65: Extend existing three lanes at approach to stop/give way line on the southbound diverge slip onto A1231				
Assessment Area	**Category**	**Qualitative Impacts**	**Quantitative Measures**	**Qualitative Score**
Capital and Revenue Costs	Outturn cost to implement	Total cost estimate (incl. preparation, supervision, land, works and optimism bias). Produced by HA Commercials team.	£1.89m	N/A
	Operating and Maintenance Costs		N/A	4
Funding Assumptions	Funding Allocation	The scheme would be funded by Central Government.	None.	N/A

Option Assessment Framework (Delivery Case)			
Junction 65: Extend existing three lanes at approach to stop/give way line on the southbound diverge slip onto A1231			
Assessment Area	**Qualitative Impacts**	**Quantitative Measures**	**Qualitative Score**
Likely Delivery Agents	Highways Agency will be the delivery agents.	None	6
Stakeholder Acceptability	There is a general consensus of stakeholders over need for interventions.	None	6
Public Acceptability / Interest	Public acceptability not likely to be a major issue.	None	6

Option Assessment Framework (Commercial Case)			
Junction 65: Extend existing three lanes at approach to stop/give way line on the southbound diverge slip onto A1231			
Assessment Area	**Qualitative Impacts**	**Quantitative Measures**	**Qualitative Score**
Route to Market	Scheme to be financed by Central Government. There is unlikely to be any great difficulty or risk in construction of the scheme.	None	6

Junction 66: Full signalisation of junction and additional lanes on slip roads



Option Assessment Framework (Strategic Fit)				
Junction 66: Full signalisation of junction and additional lanes on slip roads				
Assessment Area	**Category**	**Objective**	**Qualitative Impacts**	**Qualitative Score**
Regional Transport and Spatial Strategy	Regional Policy Alignment	Improve Economic Performance of Region	Fits with wider national, regional and local policies that consider that improvements to A1 NGWB are fundamental to the economic performance of the region.	5
		'Doing more with less'	Attempt at 'doing more with less' but the level of benefits will be limited by the relatively small scale of the scheme.	4
		Maintain and improve accessibility to jobs, housing and key services	Will improve accessibility to/from Birtley Neighbourhood Opportunity Area. The scheme will also improve linkages between A1 NWGB corridor, Durham and southern areas of Gateshead.	5
		Reduction in the variability of journey times along the corridor	The scheme should reduce delays impacting on reliability for traffic which uses Junction 66 although it may worsen existing congestion on A1 mainline in this area as more vehicles are able to enter the A1.	5
		Reduction in collisions, in particular incidents involving pedestrians.	There may be a slight reduction in the number of accidents.	4
	Local Policy Alignment	Supporting more housing developments in the area and wider region	The scheme is unlikely to impact on housing developments in the area or wider region.	4

		Maintaining air quality with regard to European legal standards.	More freely flowing traffic may lead to a slight improvement in air quality.	4
Meeting Intervention Objectives	Scheme Objectives Fit	Economic Growth and Development	The scheme reduces delays impacting on reliability. There is a risk however that improving traffic flow at this junction may worsen existing congestion on the A1 mainline in this area as more vehicles are able to enter the A1.	5
		Movement of Goods and Access to Transport Hubs	The scheme will increase capacity and reduce delays for traffic using Junction 66.	5
		Accessibility	The scheme will improve accessibility to/from Birtley Neighbourhood Opportunity Area.	5
		Journey Times	The increase in capacity will reduce the number of incidents and delays which will lead to an improvement in journey times.	5
		Safety	The scheme may lead to a slight reduction in the risk of a collision.	4
		Resilience	The increase in capacity is likely to lead to improvements to journey times and reliability for traffic using Junction 66. There is a risk however that improvements to this junction may worsen existing congestion on A1 mainline in this area as more vehicles are able to enter the A1.	5
		Environment	More freely flowing traffic may improve air quality and reduce carbon emissions. Scheme may have a slight adverse impact on the built and natural environment.	3
		Deliverability	Medium scale scheme which could be delivered in 1-2 years.	6

Option Assessment Framework (Value for Money)				
Junction 66: Full signalisation of junction and additional lanes on slip roads				
Objective	**Sub-Objective**	**Qualitative Impacts**	**Quantitative Measures**	**Qualitative Score**
Economy	Business Users & Transport Providers	Journey times will improve and vehicle operating costs will be reduced due to higher travel speeds for users travelling at congested times. The increase in capacity will also reduce delays which will improve reliability.	None.	5
	Reliability	Reduces delays and incidents impacting on reliability.	None.	5
	Regeneration	This scheme is unlikely to have a significant impact on regeneration.	None.	4

Environment	Noise	On-line widening of the northbound and southbound exit slip roads to the A1 at J66 is likely to increase overall emissions from these road segments due to decreasing congestion at busy times (free flowing traffic generally produces more noise), and a resulting, potentiall increase in road users. Depending upon the level of the attendant reductions to congestion on the main A1, A167 and B1296 carriageways and existing slip roads / roundabouts at the junction, the intervention may increase noise emissions from these road segments also. The size of the effect will vary by time of day, and will be most apparent during particularly congested periods in the existing baseline scenario. However, the spatial effects of widening (i.e. the increase in noise levels due to the decreased distance between the dwellings and the effective noise centreline of the slip road) are likely to be wholly masked by noise on the main A1, A167 and B1296 carriageways and existing slip roads / roundabout. The nearest residential areas are some 75m to the south in Birtley, with other properties to the north in Eighton Lodge (min. 150m from widening works), and unlikely to experience any measurable increase in noise as a result of the spatial effects of widening.	Sizeable population potentially affected (northern environs of Birtley, plus Eighton Lodge). However, it is not expected that the proposed intervention(either on its own or cumulatively with proposed interventions on the main A1/A1(M) carriageway) would increase noise levels at any receptor by more than 3dB.	3

	Air Quality	The proposed widening would result in an increase in the carriageway widths by up to 3.65m; although this reduces the distance between the carriageway and sensitive receptors, as the change is less than 5m it is unlikely to bring about a significant change in local air quality. The widening would reduce the distance of the northbound diverge to a small number of residential properties within 200m in Birtley, but none of these properties would be within 50m of the carriageway widenings and given that pollution concentrations decrease rapidly with distance from source, any direct effects on air quality due to changes in flow or speed are considered unlikely to be significant at these properties. Partial signalisation of the junction has the potential to slow traffic near to the signals and could lead to a slight worsening in local air quality due to queuing; however in peak periods, these signals should improve flows at the junction. There are a small number of sensitive receptors, including a care home and residential properties, located within 50m to the north of the junction which could be affected by changes in air quality related to the proposed interventions where they alter flow or speed. Overall, the proposed interventions aim to reduce congestion on the network and increase the free flow of traffic which would have positive benefits for local air quality.	None.	4

	Greenhouse Gases	The proposed widening would increase the width of the slip road by up to 3.65m and would ease congestion of traffic leaving the A1. A reduction in queuing allows more constant vehicle speeds and limits stop/start traffic - having a beneficial effect on GHG emissions. It is unclear whether part-signalisation will increase stop/start traffic in the wider road network. However, this assessment has been focussed solely on the junction. As such, part-signalisation is assumed to increase stop/start traffic, thereby having a negative effect. As such, this will balance out the benefit of widening the lanes. Whilst increased flow could affect the number of vehicles travelling at speeds in excess of the speed limit this is not expected to be an issue here as the slip road is on the approach to a junction.	None	4
	Landscape	In broad terms the landscape character of the area is largely urban. With residential properties situated to the south between Junction 65 and 66. Junction 66 is situated within a Designated Green Belt The removal of any vegetation around the junction to facilitate the works may have a slight adverse impact on the character of the area and the Green Belt.	This option is likely to have a potential impact upon the setting of the designated Green Belt.	3
	Townscape	This is a mainly rural area with urban development limited to the south between junctions 65-66. The following visual receptors have been identified ■ Residential area to the south between junctions 65-66 ■ St Joseph's RC Primary school, 100m south, situated between junctions 65-66 There is a key vista from the Angel of the North, situated 100m north of the A1, north of Junction 66. Although not a designated site, the Angel of the North is nationally recognised as important public art and is a popular visitor attraction. The removal of any vegetation to facilitate the works may cause a slight adverse impact upon the identified visual receptors.	Important views are possible from residential areas including community buildings eg schools, the A1 may be visible from upper storeys of the properties. Potential slight adverse impact upon view to and from the Angel of the North	3

	Historic Environment	Historic maps illustrate the development of the area from a rural landscape dotted with small villages to one that is still largely rural but built up with large residential and industrial areas along the railway line There is one Scheduled Monument (SM) situated less than 1km from the proposed option in junction 66. All of these may potentially be adversely affected. There are no Listed Buildings. ■ Bowles Railway SM crosses the A1 300m south of Junction 66. Overall this option is likely to have little potential effect upon the Bowles Railway SAM	This option is likely to have a potential impact upon Bowles railway SM	3
	Biodiversity	An area of Ancient Woodland abuts the A1 on the south western portion of junction 66. Given the extent of the route, it is likely that protected species such as Bats, Badgers and Great Crested Newts will be present in the area. The overall effect is likely to be limited to the potentially moderate to slight, adverse impact upon the Ancient Woodland at Junction 66, as land-take will be required for the widening. There may also be potential impacts on protected species, however further surveys would be needed to establish this.	This option is likely to have a potential impact upon the Ancient Woodland at Junction 66 if land take is required.	3
	Water Environment	There are no water courses or Flood Zones in close proximately to the Junction	Flood Zone 3b- 0m Flood Zone 2 -0m	4
Society Impact	Non-business users	Journey times will improve and vehicle operating costs will be reduced for users travelling at congested times. The increase in capacity should reduce the number of incidents and delays and lead to an increase in reliability.	None.	5
	Physical Activity	The scheme will have no impact on the number or length of walking or cycling trips.	None.	4

	Journey Quality	There may be a small reduction in traveller stress due to fewer delays which may reduce frustration and the fear of being involved in an accident may also be reduced.	None.	4
	Accidents	The scheme may lead to a slight reduction in the risk of a collision.	None.	4
	Security	The scheme is unlikely to have any impact on the risk of crime.	None.	4
	Access to Services	People will be “at least no worse off” as a result of the scheme.	None.	4
	Affordability	There could be a small reduction in vehicle operating cost (VOC) as a result of reduced queuing.	None.	5
	Severance	The scheme will have no impact on the routes used by pedestrians, cyclists and equestrians.	None.	4
	Option Values	There is unlikely to be any impact on option values as a result of the scheme.	None.	4
Public Accounts	Cost to Transport Budget	Total cost estimate (incl. preparation, supervision, land, works and optimism bias). Produced by HA Commercials team converted to PVC.	£2.05m	N/A
	Indirect Tax Revenues	There may be a small reduction in indirect tax revenue due to the increased capacity which may lead to less start-stopping and therefore reduce fuel consumption.	None.	3
Indicative Benefit Cost Ratio	Cost to Private Sector	Zero.	Zero.	N/A

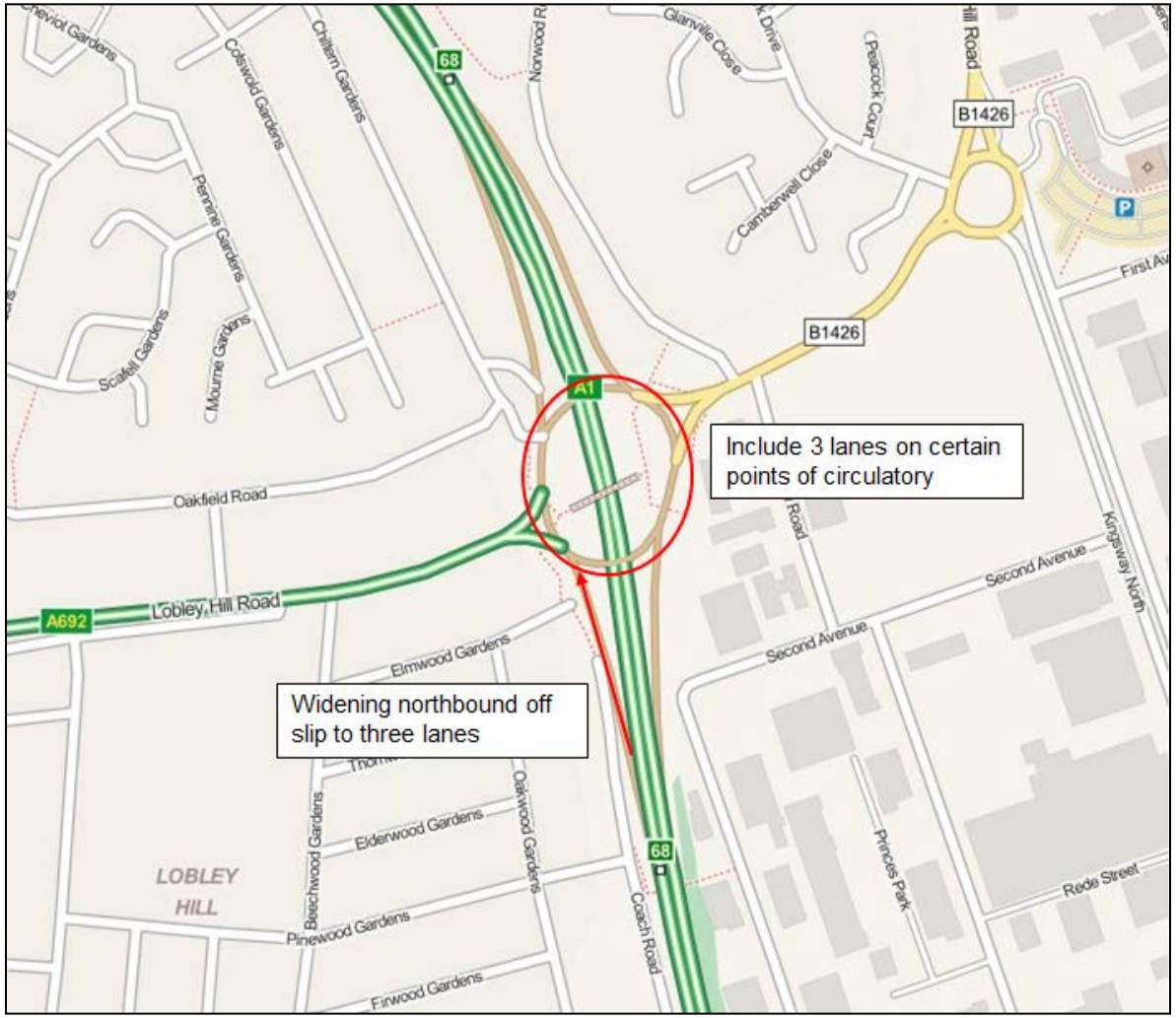
	Indicative Net Present Value	Not calculated at this stage.	None.	N/A
	Indicative BCR	Not calculated at this stage.	None.	High: BCR = 2-4.

Option Assessment Framework (Financial Case)				
Junction 66: Full signalisation of junction and additional lanes on slip roads				
Assessment Area	**Category**	**Qualitative Impacts**	**Quantitative Measures**	**Qualitative Score**
Capital and Revenue Costs	Outturn cost to implement	Total cost estimate (incl. preparation, supervision, land, works and optimism bias). Produced by HA Commercials team.	£2.82m	N/A
	Operating and Maintenance Costs		N/A	4
Funding Assumptions	Funding Allocation	The scheme would be funded by Central Government.	None.	N/A

Option Assessment Framework (Delivery Case)			
Junction 66: Full signalisation of junction and additional lanes on slip roads			
Assessment Area	**Qualitative Impacts**	**Quantitative Measures**	**Qualitative Score**
Likely Delivery Agents	Highways Agency will be the delivery agents.	None	6
Stakeholder Acceptability	There is a general consensus of stakeholders over need for interventions.	None	6
Public Acceptability / Interest	Public acceptability not likely to be a major issue.	None	6

Option Assessment Framework (Commercial Case)			
Junction 66: Full signalisation of junction and additional lanes on slip roads			
Assessment Area	**Qualitative Impacts**	**Quantitative Measures**	**Qualitative Score**
Route to Market	Scheme to be financed by Central Government. There is unlikely to be any great difficulty or risk in construction of the scheme.	None	6

Junction 68: Widening northbound off slip to three lanes



Option Assessment Framework (Strategic Fit)				
Junction 68: Widening northbound off slip to three lanes				
Assessment Area	**Category**	**Objective**	**Qualitative Impacts**	**Qualitative Score**
Regional Transport and Spatial Strategy	Regional Policy Alignment	Improve Economic Performance of Region	Fits with wider national, regional and local policies that consider that improvements to A1 NGWB are fundamental to the economic performance of the region.	4
		'Doing more with less'	Attempt at 'doing more with less' but the level of benefits will be limited by the relatively small scale of the scheme.	4
		Maintain and improve accessibility to jobs, housing and key services	The scheme will lead to a small improvement in accessibility to and from Team Valley.	5
		Reduction in the variability of journey times along the corridor	The scheme should prevent queues developing from Junction 68 back on to the A1 mainline which will reduce delays and improve reliability.	5
		Reduction in collisions, in particular incidents involving pedestrians.	The scheme may lead to a small reduction in the likelihood of a collision.	4
	Local Policy Alignment	Supporting more housing developments in the area and wider region	The scheme is unlikely to impact on housing developments in the area or wider region.	4
		Maintaining air quality with regard to European legal standards.	More freely flowing traffic may lead to a slight improvement in air quality.	4

Meeting Intervention Objectives	Scheme Objectives Fit	Economic Growth and Development	The scheme will prevent queues forming from the junction back on to the A1 mainline which will reduce delays impacting on reliability.	5
		Movement of Goods and Access to Transport Hubs	The scheme will reduce the likelihood of queues forming back from Junction 68 on to the A1 mainline leading to reduced delays for traffic using the A1.	5
		Accessibility	The scheme will lead to a small improvement in accessibility to and from Team Valley.	5
		Journey Times	The increase in capacity will prevent queues from Junction 68 back on to the A1 mainline which will reduce delays leading to improved journey times at congested times.	5
		Safety	The scheme may lead to a slight reduction in the risk of a collision.	4
		Resilience	Extending the diverge slip roads to 3 lanes will reduce the likelihood of queues forming back from Junction 68 on to the A1 mainline which will improve the resilience of the network.	5
		Environment	Scheme may have a slight adverse impact on the built and natural environment.	3
		Deliverability	Small scale works which should be feasible.	7

Option Assessment Framework (Value for Money)				
Junction 68: Widening northbound off slip to three lanes				
Objective	**Sub-Objective**	**Qualitative Impacts**	**Quantitative Measures**	**Qualitative Score**
Economy	Business Users & Transport Providers	The scheme will reduce the likelihood of queues forming back from Junction 68 on to the A1 mainline which will reduce journey times and vehicle operating costs and improve reliability at congested times. There may also be some connectivity benefits as the scheme will improve linkages between Team Valley and other locations of economic importance in the region.	None.	5
	Reliability	Reduces delays and incidents impacting on reliability at congested times.	None.	5
	Regeneration	This scheme is unlikely to have a significant impact on regeneration.	None.	4

Environment	Noise	On-line widening of the northbound exit slip road to the A1 J68 and widening of portions of the roundabout are likely to increase overall emissions from these road segments due to decreasing congestion at busy times (free flowing traffic generally produces more noise), and a resulting, potential increase in road users. Depending upon the level of the attendant reductions to congestion on the main A1 carriageway the intervention may, for similar reasons, increase noise emissions from this road segment also. The size of the effect will vary by time of day, and will be most apparent during particularly congested periods in the existing baseline scenario. However, the spatial effects of widening (i.e. the increase in noise levels due to the decreased distance between the dwellings and the effective noise centreline of the slip road) are likely to be wholly masked by noise on the existing A1 carriageway and slip road, with the potential exception of properties immediately west of the northbound A1 slip road widening (Coach Road / Elmwood Gardens). These properties may experience a marginal increase in noise due to the spatial effects of widening.	Sizeable population potentially affected (eastern environs of Lobley Hill). However, it is not expected that the proposed intervention(either on its own or cumulatively with proposed interventions on the main A1/A1(M) carriageway) would increase noise levels at any receptor by more than 3dB.	3

	Air Quality	The proposed widening would result in an increase in the carriageway widths by up to 3.5m; although this reduces the distance between the carriageway and sensitive receptors, as the change is less than 5m it is unlikely to bring about a significant change in local air quality. A review of detailed mapping in the vicinity of the widening of this section of the carriageway indicates that there are existing residential dwellings within close proximity (in Lobley Hill), including a handful of properties within approximately 20m. The widening of this carriageway therefore has the potential to worsen air quality at these receptor locations, where the improvements bring about increased traffic flow on the road network. The minor widening of the circulatory carriageway would not move the carriageway any closer to receptors and would not be expected to affect local air quality. Again, the proposed interventions aim to reduce congestion on the network, improving the free-flow of traffic which would have a beneficial impact on local air quality and thus potentially offsetting any worsening of air quality related to reducing the distance between the carriageway and residential properties.	None.	4
	Greenhouse Gases	The proposed widening would increase the width of the slip road by up to 3.65m and would ease congestion of traffic leaving the A1. A reduction in queuing allows more constant vehicle speeds and limits stop/start traffic - having a beneficial effect on GHG emissions. Whilst increased flow could affect the number of vehicles travelling at speeds in excess of the speed limit this is not expected to be an issue here as the slip road is on the approach to a junction.	None	5

	Landscape	The character of this area is mainly residential. Dunston Hill residential area with associated schools and community facilities is situated to the south. Residential properties are directly adjacent to the A1 on its northern side. The removal any vegetation around the junction to facilitate the works may have a slight adverse impact on the character of the area.	Does the option impact on a designated site: No.	3
	Townscape	In relation to visual impact, given the proximity of residential properties and Green Belt the potential exists for adverse impacts upon all of these receptors. The following visual receptors have been identified ■ Dunston Hill Residential area to the south of the A1 ■ Residential properties to the North The removal of any vegetation to facilitate the works may cause a slight adverse impact upon the identified visual receptors.	Important views are possible from residential areas including community buildings eg schools, the A1 may be visible from upper storeys of the properties.	3
	Historic Environment	Historic maps illustrate the development of the area from a rural landscape dotted with small villages to one built up with large residential areas and industrial units. The introduction of major highways doesn't appear until the 1980's The Listed Buildings within the area are located over 600m from the scheme. There is also a Scheduled Monument- coal mining remains at Dunston Hill situated 600m west of the A1. Overall this option is likely to have little potential effect upon the Listed Buildings due to their distance and the small nature of the works.	Does the option impact on a designated site (Grade I and II*, WHS, SM, Registered Park or Garden, Conservation Areas): No	3

	Biodiversity	Cross Meadow Local Nature Reserve (LNR) is located 500m east of Junction 68 It is likely that protected species such as Bats, Badgers and Great Crested Newts may be present in the area. The overall impact of the works is likely to be limited to the potential adverse effect upon the LNR from any removal of vegetation. Further surveys would be needed to establish the impact upon Protected species.	This option would potentially impact upon the LNR.	3
	Water Environment	There are no water courses or Flood Zones in close proximately to the Junction. A small watercourse lies approximately 400m north east of the Junction.	Flood Zone 3b- 0m Flood Zone 2 -0m	4
Society Impact	Non-business users	The scheme will reduce the likelihood of queues forming back from Junction 68 on to the A1 mainline which will reduce journey times and vehicle operating costs. The increase in capacity should reduce the number of incidents and delays and lead to an increase in reliability.	None.	5
	Physical Activity	The scheme will have no impact on the number or length of walking or cycling trips.	None.	4
	Journey Quality	There may be a small reduction in traveller stress due to fewer delays which may reduce frustration and the fear of being involved in an accident may also be reduced.	None.	4
	Accidents	The scheme may lead to a slight reduction in the risk of a collision.	None.	4
	Security	The scheme is unlikely to have any impact on the risk of crime.	None.	4
	Access to Services	People will be “at least no worse off” as a result of the scheme.	None.	4
	Affordability	There could be a small reduction in vehicle operating cost (VOC) as a result of reduced queuing.	None.	5

	Severance	The scheme will have no impact on the routes used by pedestrians, cyclists and equestrians.	None.	4
	Option Values	There is unlikely to be any impact on option values as a result of the scheme.	None.	4
Public Accounts	Cost to Transport Budget	Total cost estimate (incl. preparation, supervision, land, works and optimism bias). Produced by HA Commercials team converted to PVC.	£2.38m	N/A
	Indirect Tax Revenues	There may be a small reduction in indirect tax revenue due to the increased capacity which may lead to less start-stopping and therefore reduce fuel consumption.	None.	3
Indicative Benefit Cost Ratio	Cost to Private Sector	Zero.	Zero.	N/A
	Indicative Net Present Value	Not calculated at this stage.	None.	N/A
	Indicative BCR	Not calculated at this stage.	None.	High: BCR = 2-4.

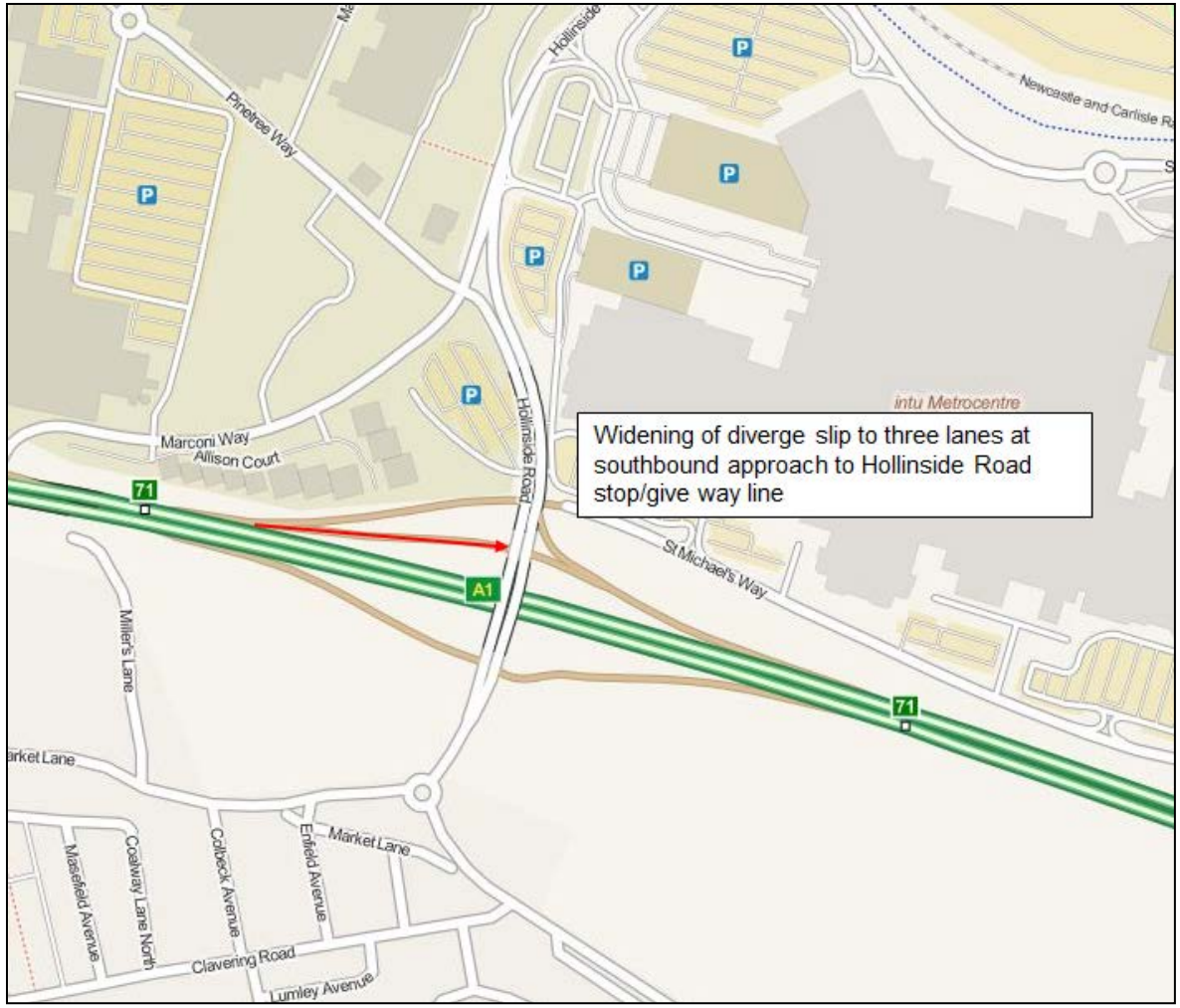
Option Assessment Framework (Financial Case)				
Junction 68: Widening northbound off slip to three lanes				
Assessment Area	**Category**	**Qualitative Impacts**	**Quantitative Measures**	**Qualitative Score**
Capital and Revenue Costs	Outturn cost to implement	Total cost estimate (incl. preparation, supervision, land, works and optimism bias). Produced by HA Commercials team.	£3.29m	N/A
	Operating and Maintenance Costs		N/A	4
Funding Assumptions	Funding Allocation	The scheme would be funded by Central Government.	None.	N/A

Option Assessment Framework (Delivery Case)			
Junction 68: Widening northbound off slip to three lanes			
Assessment Area	**Qualitative Impacts**	**Quantitative Measures**	**Qualitative Score**
Likely Delivery Agents	Highways Agency will be the delivery agents.	None	6
Stakeholder Acceptability	There is a general consensus of stakeholders over need for interventions.	None	6

Public Acceptability / Interest	Public acceptability not likely to be a major issue.	None	6

Option Assessment Framework (Commercial Case)			
Junction 68: Widening northbound off slip to three lanes			
Assessment Area	**Qualitative Impacts**	**Quantitative Measures**	**Qualitative Score**
Route to Market	Scheme to be financed by Central Government. There is unlikely to be any great difficulty or risk in construction of the scheme.	None	6

Junction 71: Widening of diverge slips to three lanes at southbound approach to Hollinside Road stop/give way line



Option Assessment Framework (Strategic Fit)				
Junction 71: Widening of diverge slips to three lanes at southbound approach to Hollinside Road stop/give way line				
Assessment Area	**Category**	**Objective**	**Qualitative Impacts**	**Qualitative Score**
Regional Transport and Spatial Strategy	Regional Policy Alignment	Improve Economic Performance of Region	Fits with wider national, regional and local policies that consider that improvements to A1 NGWB are fundamental to the economic performance of the region.	4
		'Doing more with less'	Attempt at 'doing more with less' but the level of benefits will be limited by the relatively small scale of the scheme.	4
		Maintain and improve accessibility to jobs, housing and key services	Improves accessibility to the Metrocentre and Metrogreen regeneration site.	5
		Reduction in the variability of journey times along the corridor	The scheme should reduce delays impacting on reliability for traffic which uses southbound approach of J71.	5
		Reduction in collisions, in particular incidents involving pedestrians.	There is unlikely to be any impact on the number of accidents.	4
	Local Policy Alignment	Supporting more housing developments in the area and wider region	The scheme is unlikely to impact on housing developments in the area or wider region.	4
		Maintaining air quality with regard to European legal standards.	Slight improvement to air quality due to more freely flowing traffic.	4

Meeting Intervention Objectives	Scheme Objectives Fit	Economic Growth and Development	The scheme reduces delays impacting on reliability. Scheme should alleviate the queueing forecast on J71 slip roads with future development traffic.	5
		Movement of Goods and Access to Transport Hubs	The scheme will increase capacity and reduce delays for traffic using southbound approach of J71.	5
		Accessibility	The scheme will improve accessibility from the Metrocentre and Metrogreen development.	5
		Journey Times	The increase in capacity will reduce delays which will lead to an improvement in journey times.	5
		Safety	There is unlikely to be any impact on the number of collisions.	4
		Resilience	The increase in capacity is likely to lead to improvements to journey times and reliability for traffic using the southbound approach of J71.	5
		Environment	Reduced queuing may improve air quality and reductions in carbon emissions but impact is likely to be small. Scheme may have a slight adverse impact on the built and natural environment.	3
		Deliverability	Medium scale scheme should be feasible barring unforeseen constraints.	6

Option Assessment Framework (Value for Money)				
Junction 71: Widening of diverge slips to three lanes at southbound approach to Hollinside Road stop/give way line				
Objective	**Sub-Objective**	**Qualitative Impacts**	**Quantitative Measures**	**Qualitative Score**
Economy	Business Users & Transport Providers	Journey times will improve and vehicle operating costs will be reduced due to higher travel speeds for users travelling at congested times. The increase in capacity will also reduce delays which will improve reliability.	None.	5
	Reliability	Reduces delays and incidents impacting on reliability.	None.	5
	Regeneration	This scheme is unlikely to have a significant impact on regeneration.	None.	4

Environment	Noise	On-line widening of the northbound exit slip road to the A1 at J71 is likely to increase overall emissions from this road segment due to decreasing congestion at busy times (free flowing traffic generally produces more noise), and a resulting, potential increase in road users. Depending upon the level of the attendant reductions to congestion on the main A1 carriageway, the intervention may, for similar reasons, increase noise emissions from this road segment also. The size of the effect will vary by time of day, and will be most apparent during particularly congested periods in the existing baseline scenario. However, the spatial effects of widening i.e. the increase in noise levels due to the decreased distance between the dwellings and the effective noise centreline of the slip road) are likely to be wholly masked by noise on the existing A1 carriageway and slip road. The nearest residential areas are some 180m to the south (Clavering Road), and unlikely to experience any measurable increase in noise as a result of the spatial effects of widening.	Sizeable population potentially affected (northern environs of Whickham). However, it is not expected that the proposed intervention(either on its own or cumulatively with proposed interventions on the main A1/A1(M) carriageway) would increase noise levels at any receptor by more than 3dB.	3
	Air Quality	The proposed widening would result in an increase in the carriageway widths by up to 3m; although this reduces the distance between the carriageway and sensitive receptors located to the south of this carriageway in Swalwell, as the change is less than 5m it is unlikely to bring about a significant change in local air quality. A review of detailed mapping data indicates there are very few receptors within 200m south of the carriageway; the closest being a residential property approximately 175m south on Market Lane. Given that pollution concentrations decrease rapidly with distance from source, any direct effects on air quality due to changes in flow or speed are considered unlikely to be significant at these properties. Furthermore, the proposed interventions aim to reduce congestion on the network and improve the free-flow of traffic which would have a beneficial impact on local air quality.	None.	4

	Greenhouse Gases	The proposed widening would increase the width of the slip road by up to 3m and would ease congestion of traffic leaving the A1. A reduction in queuing allows more constant vehicle speeds and limits stop/start traffic - having a beneficial effect on GHG emissions. Whilst increased flow could affect the number of vehicles travelling at speeds in excess of the speed limit this is not expected to be an issue here as the slip road is on the approach to a junction.	None	5
	Landscape	The character of this area is mainly industrial and retail. To the north of the A1 there are major retail outlets including the Metrocentre, Ikea and a large Asda, all with associated large areas of car parking. Smaller industrial units are situated to the south. South of junction 71 is Swalwell village. A small, industrial village with row of terraced properties and a population of approximately 3200. To the south of the A1 and east of Junction 71 is designated Green Belt. Works to this junction may encroach into and impact upon the Green Belt. There are substantial areas of vegetation around Junction 71. The removal of any vegetation to allow the works may have a slight adverse impact on the character of the area and the Green Belt.	This option is likely to have a potential impact upon designated Green Belt.	3
	Townscape	In relation to visual impact, given the proximity of residential properties, Green Belt and rural areas containing Public Rights of Way, the potential exists for adverse impacts upon all of these receptors. The following visual receptors have been identified ■ Residential area to the south of Junction 71 The removal of any vegetation to facilitate the works may cause a slight adverse impact upon the identified visual receptors. .	Important views are possible from residential areas including community buildings eg schools and shops. The A1 may be visible from upper storeys of the properties. The public right of way also has key views of the surrounding areas.	3

	Historic Environment	Historic mapping highlights that this area has developed from a rural landscape in the 1860's to one highly populated with residential and industrial properties. There are two Grade II Listed Buildings within 1km of the proposed scheme and one Scheduled Monument (SM) – Coal remains at Dunston Hill Overall this option is likely to have little potential effect upon the Listed Buildings and SM due to their distance from and the small nature of the works.	Does the option impact on a designated site (Grade I and II*, WHS, SM, Registered Park or Garden, Conservation Areas): No	3
	Biodiversity	A Local Nature Reserve (LNR) runs concurrently along the northern A1 highway boundary south of the A1 up to Junction 71. It is likely that protected species such as Bats, Badgers and Great Crested Newts may be present in the area. The overall impact of the works is likely to be limited to the potential adverse effect upon the LNR from any removal of vegetation including potential large to moderate adverse effects upon protected species. Further surveys would be needed to establish the impact upon Protected species.	This option would potentially impact upon the LNR.	3
	Water Environment	There are no water courses or Flood Zones in close proximately to the Junction. The River Derwent lies 500m to the west.	Flood Zone 3b- 0m Flood Zone 2 -0m	4
Society Impact	Non-business users	Journey times will improve and vehicle operating costs will be reduced for users travelling at congested times. The increase in capacity should reduce delays and lead to an increase in reliability.	None.	5
	Physical Activity	The scheme will have no impact on the number or length of walking or cycling trips.	None.	4
	Journey Quality	There may be a small reduction in traveller stress due to fewer delays which may reduce frustration and the fear of being involved in an accident may also be reduced.	None.	4

	Accidents	The scheme may lead to a slight reduction in the risk of a collision.	None.	4
	Security	The scheme is unlikely to have any impact on the risk of crime.	None.	4
	Access to Services	People will be “at least no worse off” as a result of the scheme.	None.	4
	Affordability	There could be a small reduction in vehicle operating cost (VOC) as a result of reduced queuing.	None.	5
	Severance	The scheme will have no impact on the routes used by pedestrians, cyclists and equestrians.	None.	4
	Option Values	There is unlikely to be any impact on option values as a result of the scheme.	None.	4
Public Accounts	Cost to Transport Budget	Total cost estimate (incl. preparation, supervision, land, works and optimism bias). Produced by HA Commercials team converted to PVC.	£0.92m	N/A
	Indirect Tax Revenues	There may be a small reduction in indirect tax revenue due to the increased capacity which may lead to less start-stopping and therefore reduce fuel consumption.	None.	3
Indicative Benefit Cost Ratio	Cost to Private Sector	Zero.	Zero.	N/A
	Indicative Net Present Value	Not calculated at this stage.	None.	N/A

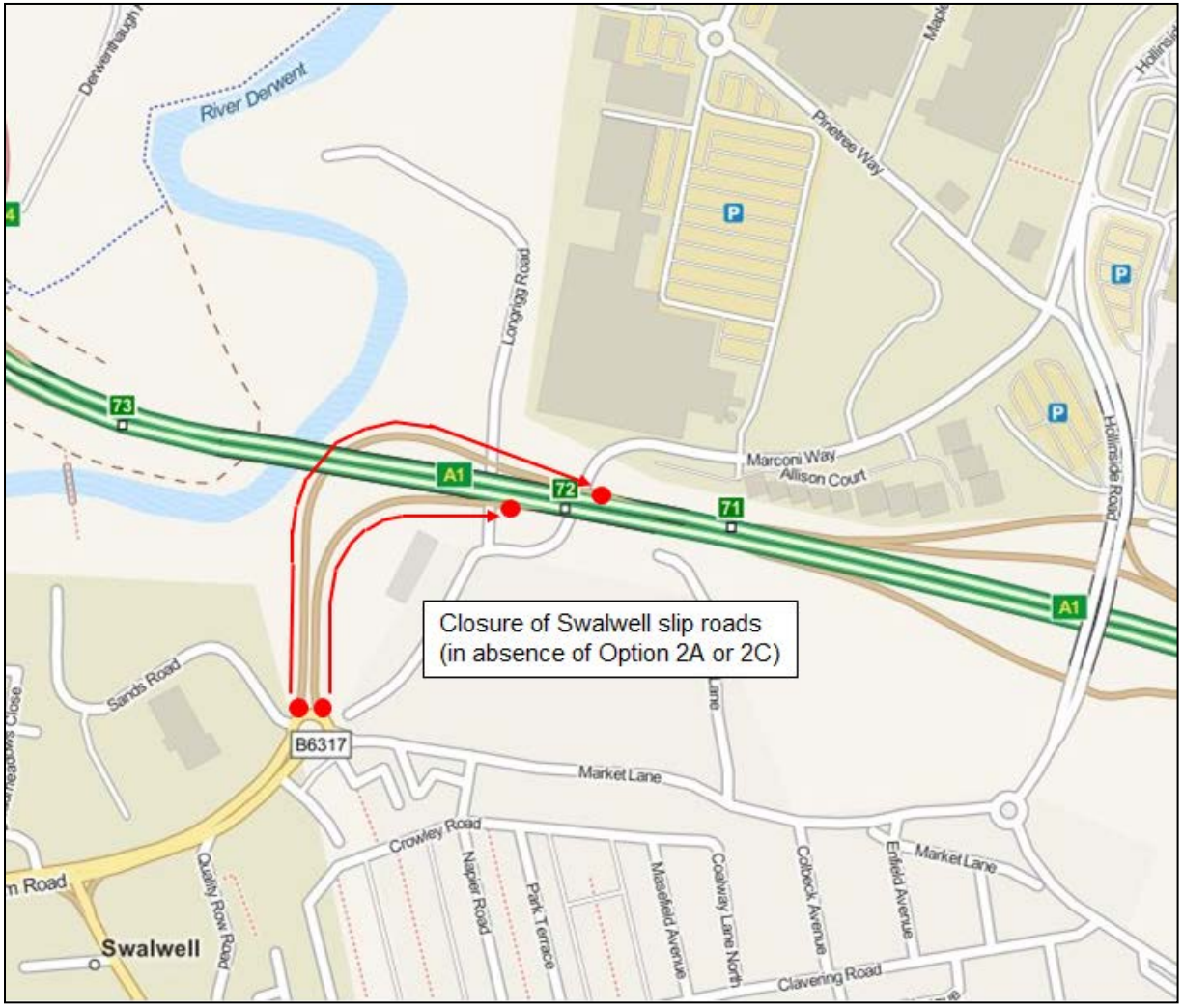
	Indicative BCR	Not calculated at this stage.	None.	Medium: BCR = 1.5-2.

Option Assessment Framework (Financial Case)				
Junction 71: Widening of diverge slips to three lanes at southbound approach to Hollinside Road stop/give way line				
Assessment Area	**Category**	**Qualitative Impacts**	**Quantitative Measures**	**Qualitative Score**
Capital and Revenue Costs	Outturn cost to implement	Total cost estimate (incl. preparation, supervision, land, works and optimism bias). Produced by HA Commercials team.	£1.27m	N/A
	Operating and Maintenance Costs		N/A	4
Funding Assumptions	Funding Allocation	The scheme would be funded by Central Government.	None.	N/A

Option Assessment Framework (Delivery Case)			
Junction 71: Widening of diverge slips to three lanes at southbound approach to Hollinside Road stop/give way line			
Assessment Area	**Qualitative Impacts**	**Quantitative Measures**	**Qualitative Score**
Likely Delivery Agents	Highways Agency will be the delivery agents.	None	6
Stakeholder Acceptability	There is a general consensus of stakeholders over need for interventions.	None	6
Public Acceptability / Interest	Public acceptability not likely to be a major issue.	None	6

Option Assessment Framework (Commercial Case)			
Junction 71: Widening of diverge slips to three lanes at southbound approach to Hollinside Road stop/give way line			
Assessment Area	**Qualitative Impacts**	**Quantitative Measures**	**Qualitative Score**
Route to Market	Scheme to be financed by Central Government. There is unlikely to be any great difficulty or risk in construction of the scheme.	None	6

Junction 72: Closure of Swallwell slip roads (in absence of Option 2A or 2C)



Option Assessment Framework (Strategic Fit)				
Junction 72: Closure of Swallwell slip roads (in absence of Option 2A or 2C)				
Assessment Area	**Category**	**Objective**	**Qualitative Impacts**	**Qualitative Score**
Regional Transport and Spatial Strategy	Regional Policy Alignment	Improve Economic Performance of Region	Fits with wider national, regional and local policies that consider that improvements to A1 NGWB are fundamental to the economic performance of the region.	5
		'Doing more with less'	Attempt at 'doing more with less' but the level of benefits will be limited by the relatively small scale of the scheme.	4
		Maintain and improve accessibility to jobs, housing and key services	The scheme should improve traffic flows along the A1 NWGB corridor but accessibility to areas served by Junction 72 will be reduced.	4
		Reduction in the variability of journey times along the corridor	Reduces delays and incidents impacting on reliability. Some disbenefits to existing users of Junction 72 which will close as part of the scheme.	5
		Reduction in collisions, in particular incidents involving pedestrians.	The scheme will reduce the amount of weaving and merging on the short stretch between Swalwell and Metrocentre junctions which currently leads to delays and likelihood of incidents.	6
	Local Policy Alignment	Supporting more housing developments in the area and wider region	The scheme is unlikely to impact on housing developments in the area or wider region.	4
		Maintaining air quality with regard to European legal standards.	Slight improvement in air quality due to more freely flowing traffic.	4

Meeting Intervention Objectives	Scheme Objectives Fit	Economic Growth and Development	Reduces delays and incidents impacting on reliability. Slight disbenefit to existing users of Swallwell slips and potential knock-on effect on other nearby junctions.	5
		Movement of Goods and Access to Transport Hubs	The scheme will lead to fewer incidents and reduce delays which will enhance the role of the A1 NGWB corridor for moving goods.	5
		Accessibility	The increase in capacity the scheme provide along the A1 NGWB corridor will increase accessibility but the closure of Junction 72 as part of the scheme will reduce accessibility to and from the areas served by this junction.	4
		Journey Times	The increase in capacity will reduce the number of incidents and delays which will lead to an improvement in journey times.	5
		Safety	The scheme will reduce weaving and merging between Swalwell and Metrocentre junctions which will lower the risk of incidents.	6
		Resilience	The increase in capacity is likely to lead to a reduction in accidents, improvements to journey times and reliability.	5
		Environment	Some minor reductions in carbon due to more freely flowing traffic. Scheme may have a slight adverse impact on the built and natural environment.	3
		Deliverability	Medium/small scale scheme which could be delivered in 6-12 months.	7

Option Assessment Framework (Value for Money)				
Junction 72: Closure of Swallwell slip roads (in absence of Option 2A or 2C)				
Objective	**Sub-Objective**	**Qualitative Impacts**	**Quantitative Measures**	**Qualitative Score**
Economy	Business Users & Transport Providers	Journey times will improve and vehicle operating costs will be reduced due to higher travel speeds for users travelling at congested times. The increase in capacity will also reduce delays which will improve reliability.	None.	5
	Reliability	Reduces delays and incidents impacting on reliability.	None.	5
	Regeneration	This scheme is unlikely to have a significant impact on regeneration.	None.	4
Environment	Noise	The proposed closure of J72 would involve the permanent closure of the northbound exit and southbound entry slip roads to the A1. This would potentially result in a substantial reduction in noise levels to residential areas located south of the junction on Market Lane / Crowley Road etc., depending upon the distance of the receptor from the slip roads and the level of noise from existing road traffic However, the traffic currently utilising J72 would be redistributed on the local road network, and would be likely to use other, nearby junctions (e.g. J71 or J73). The redistribution could adversely affect noise levels in the vicinity of these junctions, their slip roads, and, more likely, the “alternative” routes away from the junction(s). The magnitude of the net disbenefit to affected properties cannot be estimated at this time, since there is insufficient data in relation to existing levels of traffic at J71 / J73 or the traffic to be redistributed away from J72. However, it can be stated that an adverse impact is likely at these junctions and along any affected routes.	Sizeable population potentially affected (northern environs of Swalwell). Reduction to some receptors could be as high as 5dB, dependant on proximity to the slip roads.	5

	Air Quality	The proposed closure of Junction 72 would involve the permanent closure of the northbound and southbound slip roads at Junction 72 of the A1. To the south of these slip roads in Swalwell, there are residential properties located within 200m, however only a small number of these are within 50m of the slip roads. In addition there are industrial/commercial properties within 50m of these slip roads, where the AQS objective for hourly mean NO_2 would apply. The closure of the two slip roads would be expected to improve local air quality within the immediate vicinity of the roads and therefore be beneficial for local air quality at the identified existing properties. However it is anticipated that traffic currently using Junction 72 would be redistributed on the local road network and would be likely to use other nearby junctions to access or leave the A1, such as Junction 71 or 73. Redistribution of traffic may have an adverse effect on local air quality near to the road links where traffic is redistributed. However, in the absence of traffic data with the proposed closure in place, the locations of any adverse effects cannot be identified or quantified. Overall, therefore, the air quality impacts are likely to be neutral.	None.	4
	Greenhouse Gases	The proposed closure of Junction 72 would involve the permanent closure of the southbound slip roads at Junction 72 of the A1. It is anticipated that traffic currently using Junction 72 for the Swalwell area would be redistributed on the local road network and would be likely to use other nearby junctions to access or leave the A1, such as Junction 71 or 73. Any decrease in emissions as a result of more constant traffic flow past the current Junction 72 may be offset by increased distances travelled by vehicles that would usually use Junction 72. However, this should be limited as both Junctions 71 and 73 are in close proximity and provide good access links to the surrounding area. An increase in traffic through Junctions 71 and 73 could have an effect on traffic flow in these areas during peak times causing an increase in emissions due to start/stop traffic.	None	3

	Landscape	The character of the area around Junction 72 is largely industrial and retail. To the north of the A1 there are major retail outlets including the Metrocentre, Ikea and a large Asda, all with associated large areas of car parking. Smaller industrial units are situated to the south. Several rows of terraced streets lie some 300m to the south, between junction 71 and 72. The River Derwent passes underneath the A1 west of junction 72. The closing of the slip road would have little effect on the character of the area, however the removal of the slip roads may require vegetation clearance creating a temporary negative effect upon the surrounding area until replanting can occur	Does the option impact on a designated site: No	3
	Townscape	In relation to visual impact, given the proximity of residential properties, Green Belt and rural areas containing Public Rights of Way, the potential exists for adverse impacts upon all of these receptors. The following visual receptors have been identified ■ Residential area to the south of Junction 72 There are key views from the public footpath along the River Derwent that passes underneath the A1, at Junction 72. The closure of the slip road is unlikely to have a direct impact upon views into and from the surrounding area. However the removal of the slip roads may require vegetation clearance creating a temporary negative effect upon views until replanting can occur.	Important views are possible from residential areas including community buildings eg schools and shops. The A1 corridor may be visible from upper storeys of the properties. The public right of way also has key views of the surrounding areas.	3
	Historic Environment	Historic maps illustrate the development of the area from a rural landscape dotted with small villages to one built up with large residential areas and industrial units along the southern bank of the Tyne. The introduction of major highways doesn't appear until the 1980's along with the Metrocentre. There are two Grade II listed monuments situated approximately 400m south of junction 72. Overall this option is likely to have a limited effect upon the setting of the Listed Buildings, although temporary works to remove the slip roads may cause a negative effect during demolition works.	Does the option impact on a designated site (Grade I and II*, WHS, SM, Registered Park or Garden, Conservation Areas): No	3

	Biodiversity	It is likely that protected species such as Bats, Badgers and Great Crested Newts may be present in the area. There may also be potential impacts on protected species, however further surveys would be needed to establish this, as demolition works of the slip road may impact upon habitats surrounding Junction 72	Does the option impact on a designated site (Ramsar, SPA, SAC, SSSI, CWS, SINC): No.	4
	Water Environment	Junction 72 lies within flood zones 2 and 3 and is a drainage hotspot. The River Derwent passes underneath Junction 72	0.4km flood zone 3 0.1km flood zone 2	3
Society Impact	Non-business users	Journey times will improve and vehicle operating costs will be reduced for users travelling at congested times. The increase in capacity should reduce the number of incidents and delays and lead to an increase in reliability.	None.	5
	Physical Activity	The scheme will have no impact on the number or length of walking or cycling trips.	None.	4
	Journey Quality	There may be a small reduction in traveller stress due to fewer delays which may reduce frustration and the fear of being involved in an accident may also be reduced.	None.	4
	Accidents	The scheme will lower the incidence of weaving and merging between Swalwell and Metrocentre junctions reducing the risk of collisions.	None.	5
	Security	The scheme is unlikely to have any impact on the risk of crime.	None.	4
	Access to Services	People will be “at least no worse off” as a result of the scheme.	None.	4

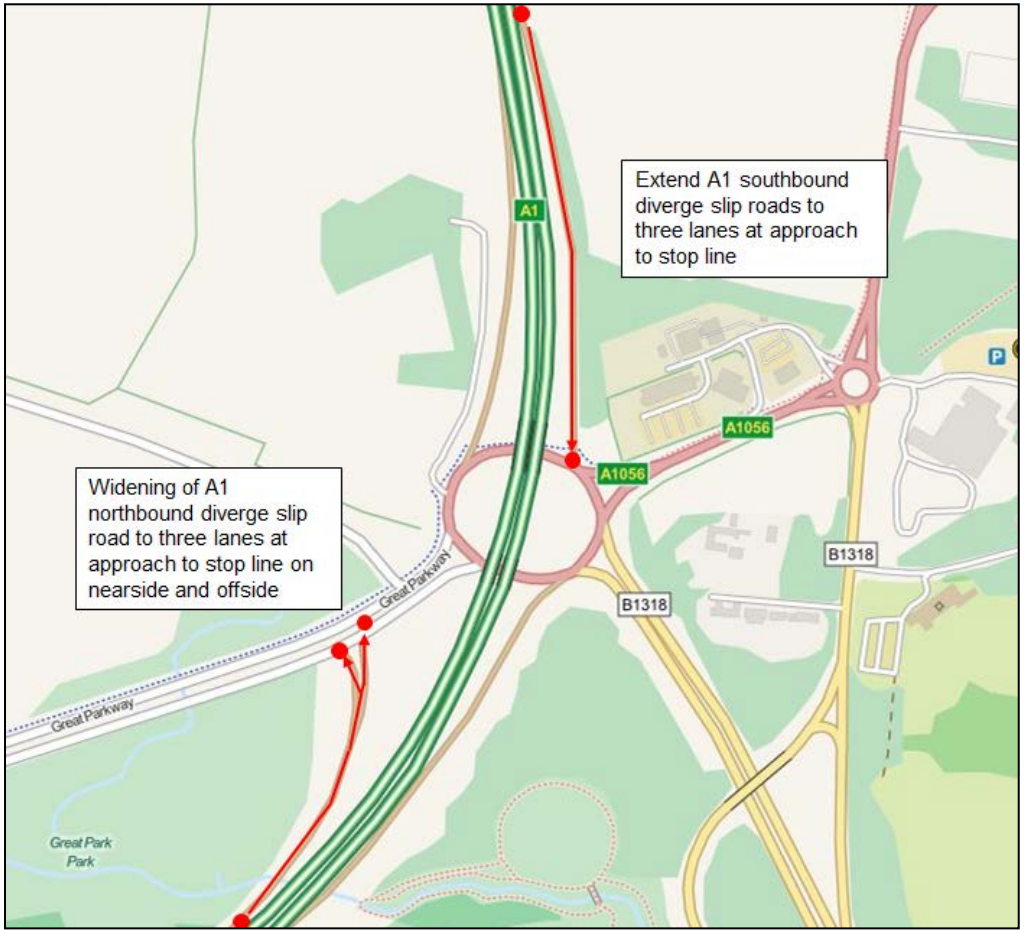
	Affordability	The scheme is unlikely to impact on travel costs to users.	None.	4
	Severance	The scheme will have no impact on the routes used by pedestrians, cyclists and equestrians.	None.	4
	Option Values	There is unlikely to be any impact on option values as a result of the scheme.	None.	4
Public Accounts	Cost to Transport Budget	Total cost estimate (incl. preparation, supervision, land, works and optimism bias). Produced by HA Commercials team converted to PVC.	£1.19m	N/A
	Indirect Tax Revenues	The scheme is unlikely have a significant impact on fuel consumption and therefore indirect tax revenue.	None.	4
Indicative Benefit Cost Ratio	Cost to Private Sector	Zero.	Zero.	N/A
	Indicative Net Present Value	Not calculated at this stage.	None.	N/A
	Indicative BCR	Not calculated at this stage.	None.	Medium: BCR = 1.5-2.

Option Assessment Framework (Financial Case)				
Junction 72: Closure of Swallwell slip roads (in absence of Option 2A or 2C)				
Assessment Area	**Category**	**Qualitative Impacts**	**Quantitative Measures**	**Qualitative Score**
Capital and Revenue Costs	Outturn cost to implement	Total cost estimate (incl. preparation, supervision, land, works and optimism bias). Produced by HA Commercials team.	£1.62m	N/A
	Operating and Maintenance Costs		N/A	4
Funding Assumptions	Funding Allocation	The scheme would be funded by Central Government.	None.	N/A

Option Assessment Framework (Delivery Case)			
Junction 72: Closure of Swallwell slip roads (in absence of Option 2A or 2C)			
Assessment Area	**Qualitative Impacts**	**Quantitative Measures**	**Qualitative Score**
Likely Delivery Agents	Highways Agency will be the delivery agents.	None	6
Stakeholder Acceptability	There is a general consensus of stakeholders over need for interventions.	None	6
Public Acceptability / Interest	Public acceptability not likely to be a major issue apart from current users of Swalwell slips.	None	5

Option Assessment Framework (Commercial Case)			
Junction 72: Closure of Swallwell slip roads (in absence of Option 2A or 2C)			
Assessment Area	**Qualitative Impacts**	**Quantitative Measures**	**Qualitative Score**
Route to Market	Scheme to be financed by Central Government. There is unlikely to be any great difficulty or risk in construction of the scheme.	None	6

Junction 79: Widening of A1 northbound diverge slip road to three lanes at approach to stop line on nearside and offside. Extend A1 southbound diverge slip roads to three lanes at approach to stop line.



Option Assessment Framework (Strategic Fit)				
Junction 79: Widening of A1 northbound diverge slip road to three lanes at approach to stop line on nearside and offside. Extend A1 southbound diverge slip roads to three lanes at approach to stop line.				
Assessment Area	**Category**	**Objective**	**Qualitative Impacts**	**Qualitative Score**
Regional Transport and Spatial Strategy	Regional Policy Alignment	Improve Economic Performance of Region	Fits with wider national, regional and local policies that consider that improvements to A1 NGWB are fundamental to the economic performance of the region.	4
		'Doing more with less'	Attempt at 'doing more with less' but the scale of benefits will be limited as the main issues are caused by traffic blocking back from neighbouring junctions therefore scheme only likely to resolve some of the issues.	4
		Maintain and improve accessibility to jobs, housing and key services	The scheme is unlikely to impact on accessibility.	4
		Reduction in the variability of journey times along the corridor	The scheme should prevent queues developing from Junction 79 back on to the A1 mainline which will reduce delays and improve reliability.	5
		Reduction in collisions, in particular incidents involving pedestrians.	The scheme may lead to a small reduction in the likelihood of a collision.	4
	Local Policy Alignment	Supporting more housing developments in the area and wider region	The scheme is unlikely to impact on housing developments in the area or wider region.	4

		Maintaining air quality with regard to European legal standards.	Change in flows and vehicle speeds will be small so little impact on air quality.	4
Meeting Intervention Objectives	Scheme Objectives Fit	Economic Growth and Development	Likely to have a minor positive impact on economic growth.	5
		Movement of Goods and Access to Transport Hubs	The scheme will reduce the likelihood of queues forming back from Junction 79 on to the A1 mainline leading to reduced delays for traffic using the A1.	5
		Accessibility	The scheme is unlikely to impact on accessibility.	4
		Journey Times	The increase in capacity will prevent queues from Junction 79 back on to the A1 mainline which will reduce delays leading to improved journey times at congested times.	5
		Safety	The scheme may lead to a slight reduction in the risk of a collision.	4
		Resilience	Extending the diverge slip roads to 3 lanes will reduce the likelihood of queues forming back from Junction 79 on to the A1 mainline which will improve the resilience of the network.	5
		Environment	Neutral impact on carbon emissions and air quality as limited impact on traffic. Scheme may have a slight adverse impact on the built and natural environment.	3
		Deliverability	Small scale scheme should be delivered quite quickly.	7

Option Assessment Framework (Value for Money)				
Junction 79: Widening of A1 northbound diverge slip road to three lanes at approach to stop line on nearside and offside. Extend A1 southbound diverge slip roads to three lanes at approach to stop line.				
Objective	**Sub-Objective**	**Qualitative Impacts**	**Quantitative Measures**	**Qualitative Score**
Economy	Business Users & Transport Providers	The scheme will reduce the likelihood of queues forming back from Junction 79 on to the A1 mainline which will reduce journey times and vehicle operating costs and improve reliability at congested times. There may also be some connectivity benefits as the scheme will improve linkages between Sunderland, Washington and South Tyneside and locations of economic importance along the A1 NGWB.	None.	5
	Reliability	Reduces delays and incidents impacting on reliability at congested times.	None.	5
	Regeneration	This scheme is unlikely to have a significant impact on regeneration.	None.	4

Environment	Noise	On-line widening of the northbound exit and northbound entry slip roads to the A1 at J79 are likely to increase overall emissions from these road segments due to decreasing congestion at busy times (free flowing traffic generally produces more noise), and a resulting, potential increase in road users. Depending upon the level of the attendant reductions to congestion on the main A1 and A1056 carriageways, and existing slip roads / roundabouts at the junction the intervention may, for similar reasons, increase noise emissions from these road segments also. The size of the effect will vary by time of day, and will be most apparent during particularly congested periods in the existing baseline scenario. However, the spatial effects of widening (i.e. the increase in noise levels due to the decreased distance between the dwellings and the effective noise centreline of the slip road) are likely to be wholly masked by noise on the main A1 and A1056 carriageways and existing slip roads / roundabout. The nearest potentially affected receptor is the Travelodge some 65m east of the proposed widening, and unlikely to experience any measurable increase in noise as a result of the spatial effects of widening.	Sizeable population potentially affected (North Brunton). However, it is not expected that the proposed intervention(either on its own or cumulatively with proposed interventions on the main A1/A1(M) carriageway) would increase noise levels at any receptor by more than 3dB.	3

	Air Quality	The proposed widening would result in an increase in the carriageway widths by up to 3.5m; although this reduces the distance between the carriageway and sensitive receptors, as the change is less than 5m it is unlikely to bring about a significant change in local air quality. The widening of the northbound diverge slip road would decrease the distance of this carriageway from a small number of residential properties to the east of the A1 within 200m. However there are no sensitive receptors within 50m from the edge of this road widening and therefore any direct effects on air quality due to changes in flow or speed as a result the widening are considered unlikely to be significant at these properties. There are no residential properties within 50m of the proposed widening of the southbound diverge slip road but there is a hotel approximately 50m east of the widening, where the AQS objective for hourly mean NO_2 objective would apply. The hotel may experience a slight worsening of air quality, however the change in road alignment is considered to be insignificant in air quality terms. In addition, air quality monitoring undertaken by NCC suggests that exceedance of the AQS objective for hourly mean NO_2 would not be expected within their administrative area. The proposed interventions aim to reduce congestion on the network, thus improving the free-flow of traffic which would have a beneficial impact on local air quality.	None.	4
	Greenhouse Gases	The proposed widening would increase the width of the slip road by up to 3.5m and would ease congestion of traffic leaving the A1. A reduction in queuing allows more constant vehicle speeds and limits stop/start traffic - having a beneficial effect on GHG emissions. Whilst increased flow could affect the number of vehicles travelling at speeds in excess of the speed limit this is not expected to be an issue here as the slip road is on the approach to a junction.	None	5

	Landscape	Junction 79 lies in an area of open land that has been left free from development. It is this area that is now designated Green Belt. Works to this junction may encroach into and impact upon the Green Belt. To the north of the Green Belt is North Gosforth and Hazlerigg residential areas. To the south lies Melton Park residential area. The A1 road corridor is lined with substantial tree belts particularly near residential areas. The removal of sections of this tree belt has the potential to adversely affect the landscape character of the area around the Junction and the Green Belt.	This option may have a potential impact upon designated Green Belt.	3
	Townscape	In relation to visual impact, given the proximity of residential properties, Green Belt and also rural areas containing Public Rights of Way, the potential exists for adverse impacts upon all of these receptors. The following visual receptors have been identified ■ Residential areas to the east and west of the A1 corridor. ■ Various schools situated within the residential areas The removal of any vegetation to facilitate the works may cause a slight adverse impact upon the identified visual receptors.	Important views are possible from residential areas including community buildings eg schools and shops. The A1 may be visible from upper storeys of the properties. The public right of way also has key views of the surrounding areas.	3

	Historic Environment	Historic mapping highlights that this area has developed from a rural landscape in the 1860's to one highly populated with residential and industrial properties. A swathe of open land has been left free from development north of Junction 79, it is this area that is now designated Green Belt. There are four Grade II Listed Buildings, one grade II* and two Scheduled Monuments (SM) situated less than 1km from junction 79. Overall this option is likely to have little potential effect upon the Listed Buildings and SM due to their distance from and the small nature of the works.	Does the option impact on a designated site (Grade I and II*, WHS, SM, Registered Park or Garden, Conservation Areas): Yes Grade II* Listed Building is located 600m from the Junction	3
	Biodiversity	Havannah Nature Reserve (LNR) is located over 600m from the junction is likely that protected species such as Bats, Badgers and Great Crested Newts may be present in the area. The overall impact of the works is likely to be limited to the potential adverse effect upon the LNR from any removal of vegetation including potential large to moderate adverse effects upon protected species. Further surveys would be needed to establish the impact upon Protected species.	This option would potentially impact upon the LNR.	3
	Water Environment	There are no water courses or Flood Zones in close proximately to the Junction	Flood Zone 3b- 0m Flood Zone 2 -0m	4
Society Impact	Non-business users	The scheme will reduce the likelihood of queues forming back from Junction 79 on to the A1 mainline which will reduce journey times and vehicle operating costs. The increase in capacity should reduce the number of incidents and delays and lead to an increase in reliability.	None.	5
	Physical Activity	The scheme will have no impact on the number or length of walking or cycling trips.	None.	4
	Journey Quality	There may be a small reduction in traveller stress due to fewer delays which may reduce frustration and the fear of being involved in an accident may also be reduced.	None.	4

	Accidents	The scheme may lead to a slight reduction in the risk of a collision.	None.	4
	Security	The scheme is unlikely to have any impact on the risk of crime.	None.	4
	Access to Services	People will be “at least no worse off” as a result of the scheme.	None.	4
	Affordability	There could be a small reduction in vehicle operating cost (VOC) as a result of reduced queuing.	None.	5
	Severance	The scheme will have no impact on the routes used by pedestrians, cyclists and equestrians.	None.	4
	Option Values	There is unlikely to be any impact on option values as a result of the scheme.	None.	4
Public Accounts	Cost to Transport Budget	Total cost estimate (incl. preparation, supervision, land, works and optimism bias). Produced by HA Commercials team converted to PVC.	£1.23m	N/A
	Indirect Tax Revenues	There may be a small reduction in indirect tax revenue due to the increased capacity which may lead to less start-stopping and therefore reduce fuel consumption.	None.	3
Indicative Benefit Cost Ratio	Cost to Private Sector	Zero.	Zero.	N/A
	Indicative Net Present Value	Not calculated at this stage.	None.	N/A

	Indicative BCR	Not calculated at this stage.	None.	Medium: BCR = 1.5-2.

Option Assessment Framework (Financial Case)				
Junction 79: Widening of A1 northbound diverge slip road to three lanes at approach to stop line on nearside and offside. Extend A1 southbound diverge slip roads to three lanes at approach to stop line.				
Assessment Area	**Category**	**Qualitative Impacts**	**Quantitative Measures**	**Qualitative Score**
Capital and Revenue Costs	Outturn cost to implement	Total cost estimate (incl. preparation, supervision, land, works and optimism bias). Produced by HA Commercials team.	£1.67m	N/A
	Operating and Maintenance Costs		N/A	4
Funding Assumptions	Funding Allocation	The scheme would be funded by Central Government.	None.	N/A

Option Assessment Framework (Delivery Case)			
Junction 79: Widening of A1 northbound diverge slip road to three lanes at approach to stop line on nearside and offside. Extend A1 southbound diverge slip roads to three lanes at approach to stop line.			
Assessment Area	**Qualitative Impacts**	**Quantitative Measures**	**Qualitative Score**
Likely Delivery Agents	Highways Agency will be the delivery agents.	None	6
Stakeholder Acceptability	There is a general consensus of stakeholders over need for interventions.	None	6
Public Acceptability / Interest	Public acceptability not likely to be a major issue.	None	6

Option Assessment Framework (Commercial Case)			
Junction 79: Widening of A1 northbound diverge slip road to three lanes at approach to stop line on nearside and offside. Extend A1 southbound diverge slip roads to three lanes at approach to stop line.			
Assessment Area	**Qualitative Impacts**	**Quantitative Measures**	**Qualitative Score**
Route to Market	Scheme to be financed by Central Government. There is unlikely to be any great difficulty or risk in construction of the scheme.	None	6