

A1 Newcastle Gateshead Western Bypass Stage 1 Report

February 2015



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Executive Summary

Introduction

The A1 Newcastle Gateshead Western Bypass (A1 NGWB) is a key linkage in the economy of the North East of England. It is also one of the most congested sections of the Strategic Road Network, with poor journey time reliability. The degraded operation of the corridor is considered to be a major barrier to the future economic development of the area. The Government have identified this section of the road network for investment aimed at tackling issues on the route. This report covers Stage 1 of a study to develop investment options for the A1 NGWB and focusses on reviewing evidence and identifying problems and issues on the route.

Traffic flows exceed the design capacity of the road, resulting in delays and unreliable journey times, particularly in peak periods. The Gateshead Western bypass in particular performs poorly against benchmarks in terms of safety. There are few performance issues to the south of J65 Birtley on the A1(M), and north of J79 North Brunton on the A1. The Gateshead section exhibits the worst performance.

The design of the Gateshead section of the A1 NGWB Western Bypass between J65 Birtley and J73 Derwentaugh is substandard with varying cross sections. It also has particularly closely spaced intersections. The substandard design contributes to the operational challenges for the corridor in terms of resilience, safety and capacity.

Public transport currently plays a relatively minor role, and offers little alternative for the local orbital journeys that utilise the corridor. Local heavy rail use is insignificant compared to the flows on the A1 NGWB, with a poor local service.

There are potential public transport improvements in the corridor, such as the reopening of the Leamside Line, which have been considered by previous, (and current) studies, and which could have some impact on modal share for certain travel movements in the corridor.

A strong stakeholder consensus exists concerning the issues and challenges in the corridor, and the need for action. Previous studies have proposed a number of potential improvements to the highway network, and the Lobley Hill to Dunston Scheme (incorporating extensions to Coalhouse and Metrocentre) has been recently approved with construction occurring between August 2014 and Spring/Summer 2016.

A number of environmental constraints exist in the corridor including the Hadrian's Wall World Heritage site, and other official safeguarded designations. Much of the corridor is immediately flanked by residential and commercial development.

A key issue concerns the role of the corridor, the balance between its strategic and local roles, and whether the performance targets and expectations for the corridor are appropriate given the balance between these roles. Travel demand data shows that more than 95% of journeys on the A1 NGWB are to, from or within the surrounding area, rather than more long-distance trips, emphasising the importance of the route for local and regional journeys.

There are significant development plans in Durham, Gateshead, Newcastle and Northumberland which will have an impact on travel demand on the A1 NGWB. Developments at Cramlington in Northumberland and in County Durham, particularly in the North of the City of Durham, are likely to load additional traffic at either end of the A1 NGWB corridor.

Although the Metrocentre to Coalhouse scheme will provide much needed relief to that section, without further intervention, conditions on the A1 NGWB will deteriorate, particularly south of Coalhouse to Birtley and between Scotswood and Ponteland Road to the north of the river.

Consideration is being given to potential major public transport improvements, such as extensions to the Metro system serving the corridor and reopening of the Leamside Line, which could potentially have an impact on travel demand on the A1 NGWB. In terms of buses, planned bus priority schemes on the Local Road Network (LRN) may displace traffic to the Strategic Road Network (SRN), unless the modal shift achieved is commensurate with the loss of general traffic capacity.

Given the current spatial pattern of development, and the demand for travel associated with it, the road in its current form is incapable of meeting the demands placed upon it. Compounding this issue, the committed plans for changes to the transport network are not commensurate with the increase in demand expected due to future planned development and background growth.

The distribution of future planned development will reinforce these patterns increasing the importance of the A1 NGWB as a key *local* artery within the city of Newcastle and Borough of Gateshead.

Resolving the conflict between the different roles, from local rat-run through to strategic highway is essential to achieving an optimal outcome. Should it be managed as a local road, with a residual strategic function, or should the – comparatively small in number – strategic users be prioritised?

It is clear, that given the current issues, future development plans and criticality of the corridor in providing reliable accessibility to enable and foster robust economic growth, that intervention is required.

1 Introduction and Purpose

1.1 Introduction

1.1.1 The HM Treasury document, Investing in Britain's Future (July 2013), set out details of the programmes of infrastructure investment expected through to 2020/21. This included the tripling of annual investment on Highways Agency major roads enhancements from today's levels to over £3bn by 2020/21. As part of that investment programme, the Government announced that it would identify and fund solutions, initially through feasibility studies to tackle some of the most notorious and long-standing road hot spots in the country. The A1 Newcastle Gateshead Western Bypass (A1 NGWB) is one of those locations.

1.1.2 The north-south link of the A1 NGWB is approximately 25km of predominantly two-lane dual carriageway with limited three-lane carriageway sections. It runs between Junction 65 at Birtley through to Junction 80 at Seaton Burn. In addition, this study covers a 14km section of the A1(M) between Carrville at Junction 62 and Birtley at Junction 65. The A1(M) is two-lane dual carriageway motorway between Junction 62 and Junction 63, and then gains a lane through Junction 65 where it meets the A1 NGWB. The study corridor is shown in Figure 1-1, with the configuration of the road layout shown in Appendix A.

1.1.3 The A1 NGWB is one of the most congested highway links in the North-East Region. More than 110,000 vehicles use the route every day on the busiest section, which is more than double the theoretical design capacity of the road; indeed this flow exceeds the recommended Maximum Opening Year flow for a dual four-lane motorway. The route is of critical economic importance for the region as it strongly aids both internal and external connectivity. At a national level, the A1 provides the main north-south link connecting Scotland, North East England, Yorkshire & Humber, East England and London.

1.1.4 The road suffers from a high level of congestion and journey time reliability issues. With significant development pressures on the route for much needed regeneration, the existing situation is forecast to worsen if no mitigation measures are implemented.

1.2 Study Purpose and Objectives

1.2.1 The aim of this study is to identify the opportunities and understand the case for future investment solutions on the A1 NGWB that are deliverable, affordable and offer value for money.

1.2.2 The specific objectives of the study are to:

- Identify and assess the case for, deliverability and timing of specific road investments that address existing problems on the A1 NGWB;
- Identify and assess the case for, deliverability and timing of specific complementary investment on local transport modes that improve the performance of the A1 NGWB;

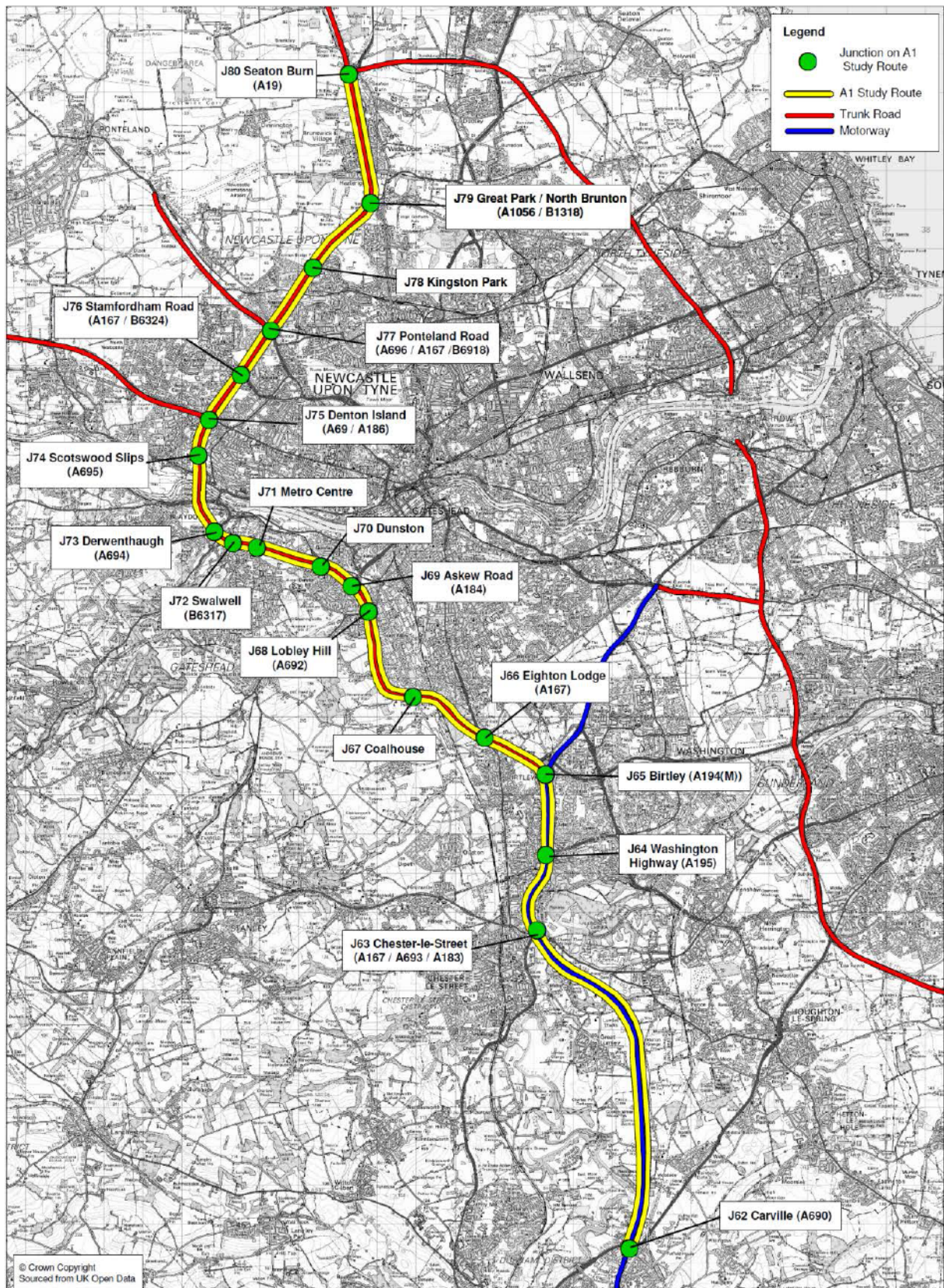


Figure 1-1 Study Corridor

- Understand the balance of benefits and impacts from potential individual investment proposals and any additional benefits or impacts from investment on a corridor basis; and
- Evidence where possible, the wider economic benefits from the transport investment in the corridor.

1.2.3 The study will also address the following questions:

- Given the assessment of current and future performance of the A1 Western Bypass, and the surrounding local transport network, are there specific priority locations/problems that should be addressed?
- Are there viable potential solutions to these problems which are deliverable, affordable and offer value for money?
- What are the potential timescales for the delivery of identified potential solutions?
- Are there additional benefits or impacts from combinations of potential solutions over and above those for individual solutions?
- Is there evidence of the impact of investment in potential solutions on the resilience of the road network?
- Have the potential solutions identified fully considered and optimised the environmental opportunities and mitigation that the potential transport investment could bring?
- Is further work/analysis required for Government to be able to make specific investment decisions, and if so what are the timescales of such work?

1.3 Study stages

1.3.1 The study is split into three stages, the first 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.

1.3.2 The three stages encompass the steps of the Transport Appraisal Process (TAP), contained within the Department for Transport's Transport Appraisal Guidance (TAG) as follows:

- Stage 1: TAP steps 1-4;
- Stage 2: TAP steps 5-9 (Produce Option Assessment Report); and
- Stage 3: Produce Strategic Outline Business Case (SOBC).

1.3.3 It is noted that the definition of the stages for this study differs from the Stages as described in TAP, as shown in Figure 1-2.

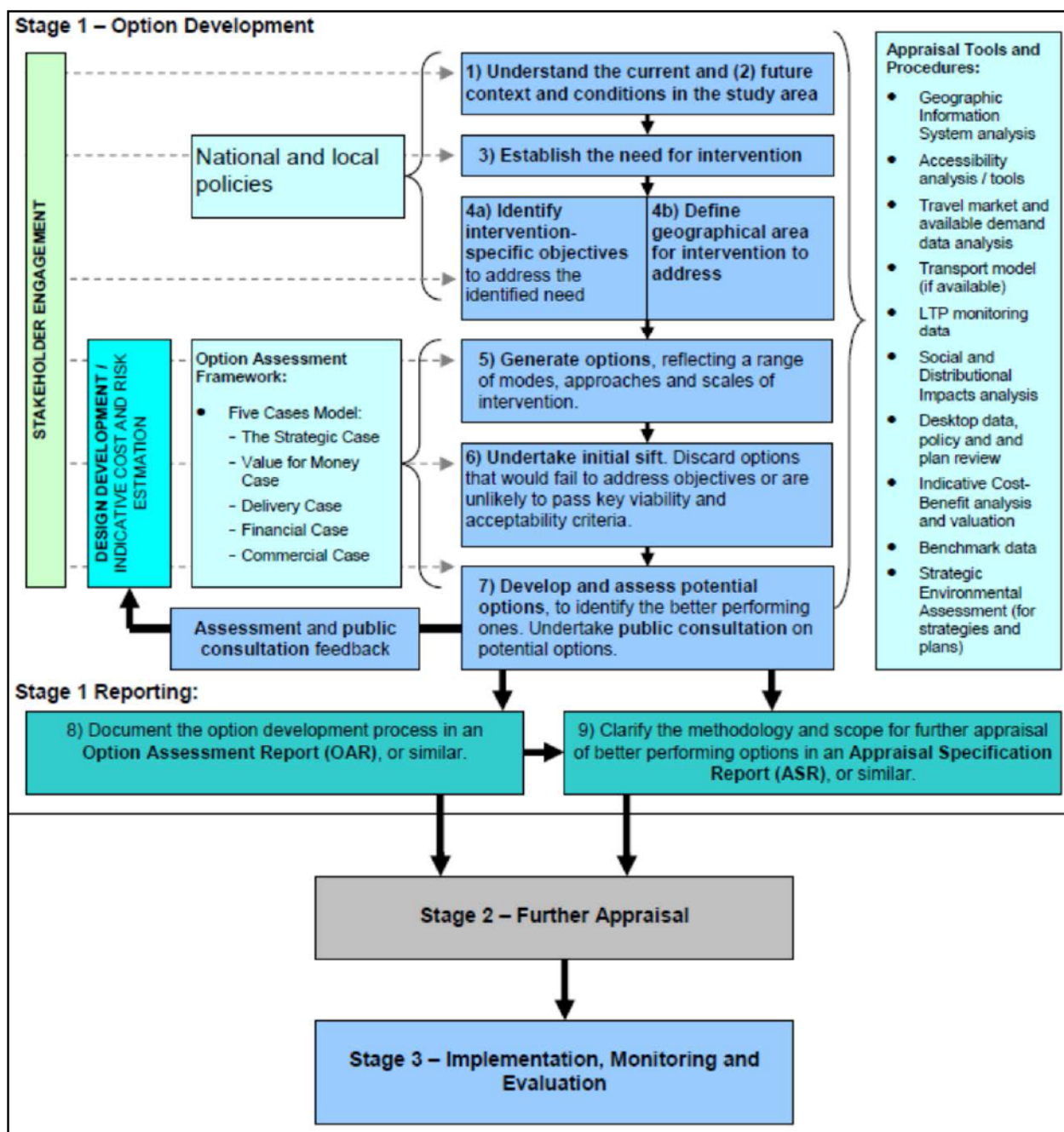


Figure 1-2: Steps in the Option development process

(Source: Transport Appraisal Process, DfT Transport Appraisal Guidance)

1.4 Stage 1 Objectives

1.4.1 The purpose of Stage 1 of the study is to review the evidence and identify problems within the study area. In particular Stage 1 will:

- review any relevant evidence gathered as part of the development and completion of the A1 J62 to A1/A19 pilot Route Based Strategy, as well as any emerging

evidence from the Highways Agency's London to Scotland East and North Pennines Route Based Strategies;

- gather and review any other related work from other studies and analysis, and form a view as to the nature and scale of current and future performance along the A1 Western Bypass;
- set out details of previous historical work and decisions taken in terms of the approach to investment or management of the A1 Western Bypass, with the aim of reaching agreement on the historical position in relation to previous investment proposals.
- establish both the availability of transport modelling and the need to undertake specific transport modelling necessary to provide analysis that would be needed to evidence answers to some of the questions to be addressed in the study; and
- present findings for consideration by the Project Board and the Reference Group where appropriate.

This Stage 1 Report presents the outputs from the study to deliver these objectives.

2 Background and Historical Context

2.1 Introduction

2.1.1 The purpose of Chapter 2 of this study is to:

- Summarise previous work undertaken in the study area, focussing on the problems and issues identified by those studies; any information on the potential for mode shift and any decisions taken about potential schemes; and
- Establish the availability of any transport modelling tools, and the need to undertake any further modelling work, to carry out any analysis of potential schemes required in later stages of this study.

2.2 Previous Studies and Reports

2.2.1 The following documents have been reviewed as part of the review of historical information:

- TAMMS Multi Modal Study (2002);
- A1 Western Bypass Scheme Appraisal Report (2003);
- A1 Gateshead Newcastle Western Bypass Options Assessment Report (2008);
- A1 Gateshead & Newcastle Western Bypass Congestion Relief Schemes (2010);
- Access to Tyne and Wear DaSTS study (2010);
- North East DaSTS Strategic Connectivity Study Report (2010);
- SRN Future Operations: Gateshead Infrastructure Study (2011);
- SRN Future Operations: Newcastle Infrastructure Study (2011);
- Newcastle City Deal (2012);
- A1 West of Newcastle Route Based Strategy (2013);
- “Go for Jobs” campaign, 2005 – 2008;
- DRAFT Route-based strategy: Evidence Report London to Scotland East (February 2014); and
- More and Better Jobs: North East Strategic Economic Plan (March 2014).

2.2.2 Each of these documents has been reviewed in order to identify issues raised, summarise previous decisions and establish the potential for mode shift along the corridor.

2.3 TAMMS Multi-Modal Study (2002)

2.3.1 The Tyneside Area Multi-Modal Study was set up specifically with the aim of developing a transport strategy to address problems on the A1 and A19 trunk roads in the Tyneside area. This study is now over ten years old, and as such should be regarded with caution.

2.3.2 The key issues identified through the study were:

- Transport Issues – car ownership, traffic growth, the highway network and public transport networks;
- Environmental Issues – local and regional environmental planning constraints and policies; and
- Social and Economic Issues – employment, deprivation, economic regeneration and restructuring.

2.3.3 Also through the consultation, key 'stress' points were identified on the A1 as being at:

- J80 Seaton Burn;
- J73 Derwenthaugh;
- J68 Lobley Hill; and
- J65 Birtley.

2.3.4 On the A1 NGWB, the number of closely spaced junctions was identified as an issue, with peak hour congestion on the stretch of the A1 between J65 Birtley and Derwenthaugh noted as a particular problem. The movement between Lobley Hill and Askew Road was highlighted as particularly problematic, where traffic from the A692 Lobley Hill Road joins the A1 for a short distance before leaving on the A184.

2.3.5 By the 2031 time horizon, the entire A1 between Birtley and Seaton Burn was predicted to be over capacity by a factor of 25%, with the exception of Blaydon Bridge. Road congestion was seen as affecting the operation of major transport interchanges such as Newcastle International Airport and the Port of Tyne.

2.3.6 Bus services were seen as suffering from road congestion, lack of enforcement of regulations and being poorly integrated with other modes. On the railways, lack of integration, uncertainty over franchises and capacity were seen as issues, with a conflict between the needs of freight, regional and long distance passengers and those of local travel.

2.4 A1 Western Bypass Scheme Appraisal Report (2003)

2.4.1 This report for the Highways Agency summarised a validation exercise of a scheme that was proposed by TAMMS involving the provision of full three lane widening on the A1 NGWB. It did not seek to verify the issues and problems identified in TAMMS. The conclusion was that the proposals for the A1 did not represent value for money due to required land take and property demolition. This conclusion highlights a critical issue for the corridor: the fact that the corridor is extremely constrained by development for much of the length of the A1 NGWB.

2.4.2 The ministerial response to the proposals that came forward was as follows:

"The Secretary of State is concerned that in the medium to longer term, in the absence of an effective local management strategy, it would draw more local traffic on to the A1 and not provide lasting benefits to the strategic road network... However, it went on: "He is asking the Highways Agency to continue to monitor the performance of the A1, to carry out further development work on the widening scheme in the light of the emerging local strategy for resolving local congestion problems and to report back to him."

2.4.3 This statement highlights a 'local' versus 'strategic' conflict over the role of the road, with it being implied that the problems are local issues to be resolved locally, and that

improvements to the strategic network are only considered as beneficial if they are protected for use by strategic traffic, rather than local traffic.

2.5 “Go for Jobs” campaign, 2005 - 2008

2.5.1 The primary issue concerning stakeholders in the corridor is the impact of the degraded operation of the A1 NGWB on the local economy. This was highlighted by this campaign started in 2005 by the local newspapers on Tyneside and Teeside in conjunction with the North East Chamber of Commerce. It aimed “to convince the Highways Agency to lift Article 14 notices on business, which block developments that could put extra traffic on the A1 or A19”. A memorandum to the Transport Select Committee on the issue from the North East Chamber of Commerce suggested that this was “putting 10,000 potential jobs and £1bn of investment at risk”.



2.5.2 This campaign contributed towards a widening perception that congestion on the SRN, and the A1 NGWB in particular was a block to economic development on Tyneside. It is notable that public perception was highlighted as an issue in TAMMS as well. Subsequently, the Agency has worked hard to foster a closer relationship with local stakeholders.

2.6 A1 Gateshead Newcastle Western Bypass – Option Identification and Selection (2008)

2.6.1 This study reported an ongoing stream of work emanating from the response to TAMMS. The study objective was to produce a package of engineering measures to reduce congestion, improve journey time reliability and improve safety, which were all identified as issues in TAMMS. Nine full length options were considered, ranging from full widening (£1,654m) to a technology only scheme (£132m), in addition to three shorter congestion relief options.

2.7 A1 Gateshead & Newcastle Western Bypass - Congestion Relief Schemes (2010)

2.7.1 Following option identification, the Secretary of State gave the DfT approval to continue with the continued development and appraisal of schemes with the potential for early completion and delivery of benefits to drivers.

2.7.2 This resultant study identified three early delivery schemes which targeted specific key issues, and were considered ‘deliverable’. One of these involved the provision of new parallel link collector distributor roads between the A692 Lobley Hill and A184 Askew Road junctions. This was further developed and approval was given from the Secretary of State for a scheme between Dunston Road through to south of Lobley Hill in 2013. An extension to this scheme, which will see three lanes being provided between Metrocentre and Coalhouse junctions was given approval in 2014.

2.8 Access to Tyne and Wear DaSTS study (Phase 1 - 2010) and North East DaSTS Connectivity Study (2010)

2.8.1 A number of studies were commissioned by DfT in 2009 under the “Delivering a Sustainable Transport System” (DaSTS) initiative. This approach sought to introduce an objectives led approach to transport planning, with a focus on non-transport goals in

order to set transport within a wider context. Two studies concerned the study area:

- Access to Tyne and Wear City Region Study; and
- North East DaSTS Connectivity Study.

2.8.2 The Evidence Review of the Access to Tyne & Wear City Region Study, dated May 2010 and prepared for the Department for Transport provides a comprehensive review of evidence associated with transport related issues in the Tyne & Wear City Region.

2.8.3 The DaSTS studies were envisaged in two phases. The first phase involved baselining and a strategic sift of options. The second phase would have developed and applied an analytical approach, however this stage was not taken forward after the 2010 General Election.

2.8.4 The aim of this study was to assess transport issues and potential solutions throughout Tyne and Wear, with the study area extending to cover parts of County Durham and Northumberland. Key issues identified for the A1 corridor were

- Reducing delay and improving journey times on the A1;
- Supporting sustainable economic growth by improving reliability and predictability of journeys on the A1 and other regionally important corridors;
- Consideration of barriers to enhanced social and economic participation and improved access to employment;
- Reviewing locations for growth;
- Considering carbon emissions and poor local air quality;
- Unlocking barriers to more physically active travel; and
- Seeking an appropriate balance between the needs of different types of travellers.

2.8.5 Analysis was carried out using data provided by the Highways Agency, including the Regional Network Report, data from the Regional Intelligence Unit and traffic monitoring systems. From this, information was included for the 'top ten' links in terms of delay in the study area. These are reproduced below in Table 2-1.

| Road Link (Current) | Road Link Length Km (Current) | Total Vehicle Hour Delay | Total Vehicle Hour Delay per Km |
|-------------------------------|-------------------------------|--------------------------|---------------------------------|
| A1 between A184 and A692 | 0.82 | 181,586 | 221,447 |
| A1 between A692 and A167 | 5.01 | 985,211 | 196,649 |
| A1 between A694 and A184 | 3.53 | 499,744 | 141,571 |
| A1 between A692 and A184 | 0.95 | 87,796 | 92,417 |
| A1 between A184 and A694 | 3.52 | 304,762 | 86,580 |
| A1 between A167 and A692 | 5.01 | 376,103 | 75,070 |
| A1 between A1(M) J65 and A167 | 2.05 | 146,070 | 71,253 |
| A1 between A1 and A694 | 2.43 | 104,919 | 43,177 |
| A19 between A191 and A1056 | 2.6 | 106,573 | 40,990 |
| A1 between A696 and A167 | 1.27 | 45,103 | 35,515 |

Table 2-1: Top ten delay links from Access to Tyne and Wear DaSTs study.

2.8.6 This analysis indicated a high level of stress concentrated within the Gateshead section, with the Lobley Hill area and Eighton Lodge areas being particularly problematic. Forecasts for 2014 showed a worsening situation. Outputs from the Tyne and Wear Transport Planning Model (TPM) were also analysed. These illustrated issues at the same locations as the stress analysis and Highway Agency information.

2.8.7 The study identified that local traffic and movements to and from County Durham formed the majority of demand on the A1. It considered the potential impact from development proposals, and the role to be played by the various modes of transport. Similar issues were identified in the parallel North East DaSTS Strategic Connectivity Study report.

2.9 SRN Future Operations Studies, Newcastle, Gateshead (2011)

2.9.1 The aim of these studies was to identify potential issues for the SRN arising from development proposals contained within the emerging local plans of the local Gateshead Borough and Newcastle City Councils.

2.9.2 Using a mesoscopic model of the SRN in Tyne and Wear, described in Section 2.17, forecasts were produced of the likely future impact of these new developments. The key network issues identified were common with those identified in other studies, however it was also found that the distribution and quotient of development proposed would exacerbate these issues over and above the impact of background growth.

2.9.3 The majority of key development sites in Newcastle and Gateshead fall within the A1 corridor, these being:

- Team Valley (adjacent to the Lobley Hill and Coalhouse interchanges);
- Metro Green (adjacent to the Metrocentre);
- Callerton Park (in the vicinity of Newcastle Airport, between 696 and Great Park);
- Great Park (adjacent to the North Brunton Interchange); and
- Dunston Hill.

2.9.4 Engagement was undertaken with Gateshead Borough and Newcastle City Councils throughout the process. This process continues, with a refresh of the information included in these studies being undertaken currently. This follows the finalisation of the Local Plan, and its submission, and is due to complete prior to the Examination in Public (EIP). This will inform the Highways Agency's submission to the Inspector. Issues surrounding future development proposals are considered further in Chapter 4.

2.10 Newcastle City Deal (2012)

2.10.1 In September 2012, City Deals were finalised between Central Government and eight of the largest cities in England. The Newcastle City Deal, which encompasses both Newcastle and Gateshead, seeks to give the area the powers needed to drive economic growth and unlock projects or initiatives that will boost the local economy.

2.10.2 Transport and Connectivity forms one of the five key parts of the city deal, it commits to:

Produce an investment programme with Government to reduce congestion on the A1 Western Bypass, to reduce journey times on one of the most congested links in the national network¹.

2.10.3 The Government made the following commitment in the City Deal:

DfT and the Highways Agency to work with Gateshead and Newcastle councils to develop local transport investment proposals to address congestion on the A1 Western Bypass

2.10.4 For its part, Newcastle and Gateshead committed to:

Establish a joint governance deliver and accountability arrangement between Newcastle and Gateshead councils, DfT and the Highways Agency to address congestion problems on the A1 Western Bypass;

Develop initiatives through the Tyne and Wear Local Transport Plan capital programme to improve integration of the local and truck road network;

Work with the LEP and partner local authorities to develop further local complementary measures for the post 2015 period; and

Invest £2.5 million in Tyne and Wear's Urban Traffic Management and Control (UTMC system).

2.11 Route Based Strategies (2012; 2014)

2.11.1 The report *A Fresh Start for the Strategic Road Network* proposed Route Based Strategies, with the consideration that they would enable a smarter approach to investment planning and support greater participation in planning for the strategic road network from local and regional stakeholders.

2.11.2 The A1/A1(M) Carrville to Seaton Burn Route Based Strategy (RBS) was one of the pilot RBSs, and was developed to ascertain the performance of the SRN, and highlight challenges and opportunities, both present and future. The study was designed to ensure that stakeholders had a voice in setting the vision and objectives for the future of the SRN.

2.11.3 The strategy, which was retitled for publication as "A1 West of Newcastle RBS", has been used to inform this report generally, and provides much of the information for Chapter 3, looking at the current situation, and Chapter 4, looking at the future situation. The

consultation undertaken as part of this RBS has informed this study.

- 2.11.4 The London to North East RBS, having a much wider focus, provides little information related to the A1 NGWB that is not provided in more detail elsewhere.

2.12 Potential for Modal Shift in the Corridor

2.12.1 There is relatively little previous work on the potential for modal shift along the corridor, other than the TAMMS study, which is now dated. Currently, there are few public transport services which operate along the corridor itself. There are, however, a number of services which traverse the corridor and others that run parallel to it. These may provide alternatives for some journeys which use the A1 NGWB for part of their trip.

2.12.2 The documents reviewed as part of this consideration include:

- Leamside Line Study (2007) – Nexus (as lead organisation);
- Connecting Communities (2009) – ATOC ;
- Leamside Line Highway Network Improvements (2009) – Highways Agency; and
- Go Smarter to Work (2012) – Tyne and Wear Integrated Transport Authority.

2.13 Leamside Line Studies

2.13.1 Of particular relevance to the A1 corridor are proposals involving the reopening of the Leamside Line, which ran from Durham, via Washington through to Newcastle via Pelaw. It closed to passengers in the 1960s, and to freight in 1992 and is officially 'mothballed' for potential future use. This is an official designation, meaning the line is not active, but neither is it disused. The route remains part of the Network Rail Network (Figure 2-1).



Figure 2-1: Leamside Line (mothballed)

1 HM Treasury (18/09/12) Government formalises Newcastle city deal Press Notice PN 84/12

(source: Network Rail East Coast Mainline Route Utilisation Strategy, 2008)

- 2.13.2 A key driver behind proposals to reopen the Leamside Line has been cited as the opportunity to remove car trips from the A1 NGWB. There would be the possibility of a major park and ride facility at J62 Carrville, which could have a role in removing trips from the A1. The site, adjacent to the track bed, currently operates as a bus based park and ride facility for Durham.
- 2.13.3 The Association of Train Operating Companies report *Connecting Communities* identified Washington, with a population of 53,400, as being a key town that would benefit from rail services being restored. Washington is currently a car focused new town. This analysis assumed diversion of the hourly Newcastle to Manchester Airport TransPennine Service, but noted that options for local services also exist. The capital cost was estimated at £86m, with a Benefit Cost Ratio of 1.4.
- 2.13.4 The opportunity to deal with network path capacity constraints is another reason that the reopening of the Leamside line has been considered. The Network Rail *East Coast Mainline 2016 Capacity Review*, published in 2008, identified that the East Coast Mainline between Northallerton and Newcastle is already approaching capacity, and services are currently flighted to meet current demand. Any move to increase service, or provide more even stopping patterns on this section on line would exceed available capacity. The reopening of the Leamside Line for freight was cited “the best solution to provide additional capacity”, but this would only be considered post-2019.

2.14 Go Smarter to Work

- 2.14.1 The successful Tyne and Wear 2012 Local Sustainable Transport Fund allocation of £5m focused on access to employment sites adjacent to, and served by the A1 corridor. A specific aim of the project was to relieve congestion on the A1 NGWB and support access to employment.
- 2.14.2 Entitled Go Smarter to Work, it is focussed on Newcastle City Centre, Gateshead Town Centre, Washington, Team Valley and Metro Centre. Sections of the bid that won funding were centred around information provision, bus priority, cycle facilities and helping job seekers access employment. Funding bids for 2015/6 seek to continue and expand the Go Smarter to Work programme.

2.15 Existing Transport Models

- 2.15.1 In order to determine if a suitable transport model existed for use within this study, a review has been undertaken of three relevant existing models. The suitability of each is discussed in turn within this section.

2.16 Tyne and Wear Transport Planning Model Version 3 (TPM3)

- 2.16.1 The Tyne and Wear Transport Planning Model (TPM), a CUBE Voyager/TRIPS multi-modal model, was developed for the Tyne and Wear authorities in 2005 to inform their Transport Innovation Fund (TIF) submission. It is a full 4-stage model, with a zoning structure that covers the whole of Great Britain (Figure 2-1).
- 2.16.2 Investigation of the TPM model in 2008 for its potential use in the 2008/9 studies of the A1 NGWB indicated that there were issues in regard to the suitability in the appraisal of prospective schemes in the A1 corridor. Of particular concern is the lack of congestion

shown in the model on the A1 NGWB (Figure 2-3), as compared to the daily congestion experienced in reality.

- 2.16.3 As a result of the limitations, Jacobs were sub-contracted to modify, re-calibrate and re-validate the TPM model for the assessment of potential improvements in the A1 corridor using newly collected survey data, however as they noted at the time:

The TPM was developed as a large and detailed multimodal variable demand model (VDM) based on WebTAG guidance and originally for TIF purposes covering a large area. It is built on the CUBE software platform, which has served it well bearing in mind the emphasis on VDM, incremental demand model and forecasting capability, but it has some certain limitations in particular with respect to wrt [with respect to] junction modelling and flow metering in congested situations.

- 2.16.4 Therefore, although improved in terms of validation in the A1 corridor, the basis of the model is still the 2005 origin-destination data, with validation at the level of a particular corridor such as the A1 still being regarded as problematic.

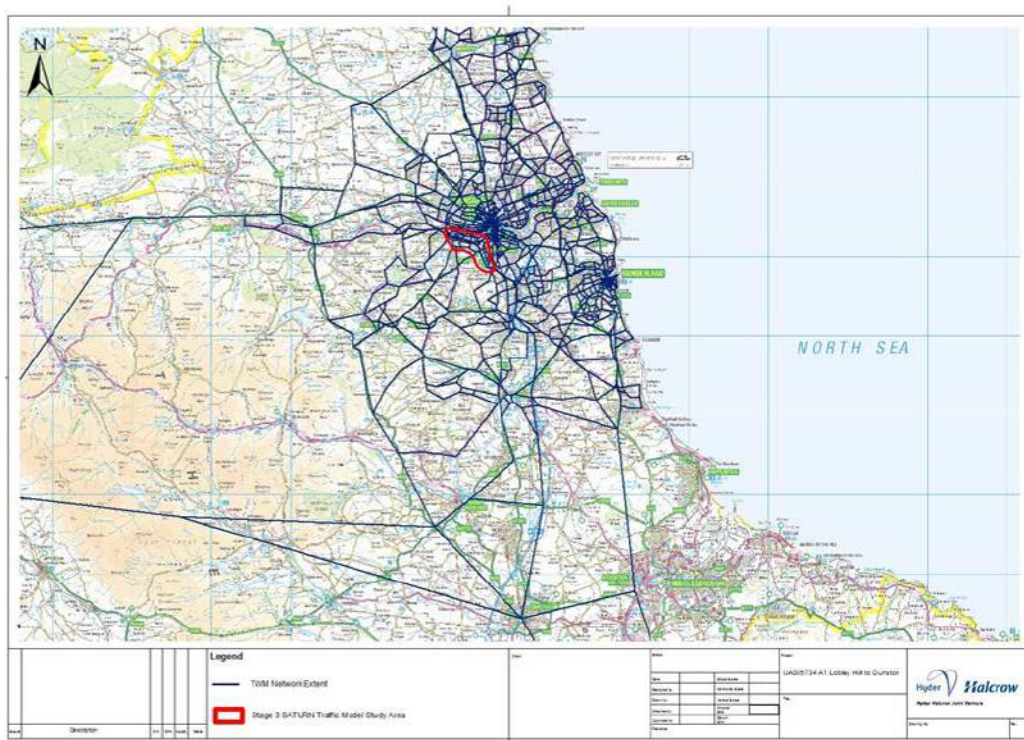


Figure 2-2: TPM3 Modelled Network in Tyne and Wear



Figure 2-3: TPM3 congested links in AM Period, 2005

2.17 A1 Lobley Hill to Dunston SATURN model

- 2.17.1 In 2013 a SATURN highway assignment model was developed for the appraisal of the A1 Lobley Hill to Dunston Improvement Scheme. The scheme was subsequently extended to encompass the section of highway between Metrocentre and Coalhouse, providing three mainline lanes throughout this section.

2.17.2 The SATURN model covers the A1 mainline between Coalhouse and Derwenthaugh, extending to cover a small area of the local road network either side of the A1 itself. The coverage is shown in Figure 2-4. Demand in the base year model was derived from survey information gathered specifically for the study.

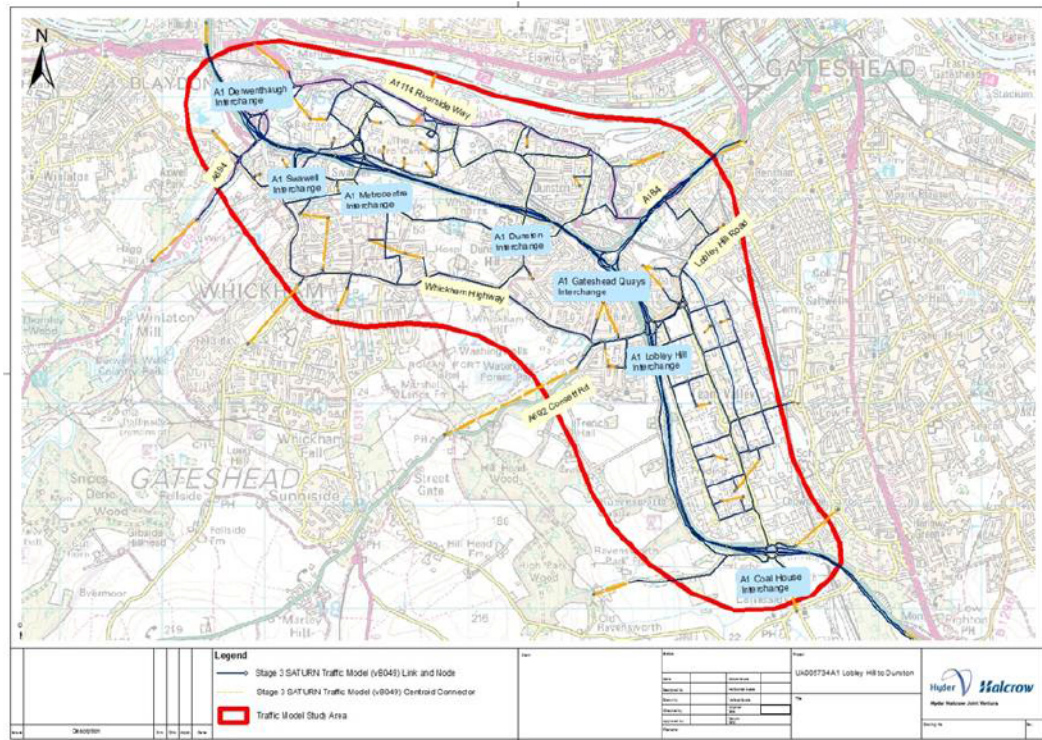


Figure 2-4: Lobley Hill scheme appraisal model (Source Lobley Hill Study, 2013)

2.18 North East SRN Mesoscopic Model (NESMM)

2.18.1 The Highways Agency Spatial Planning team maintains a mesoscopic simulation model that covers much of the Strategic Road Network in the North East. This is a corridor based model, which extends to cover key development areas adjacent to the SRN, such as the Metrocentre and Team Valley.

2.18.2 The model, which uses the Dynameq software package, covers the A1/A1(M) between Scotch Corner to Morpeth, A19 between Peterlee and its termination at the A1 at Seaton Burn, A184, A194(M) and the A690. Originally validated for 2010, it has recently been revalidated to using data collected in November 2012. The coverage of the A1 mesoscopic model in relation to the study corridor is shown in Figure 2-5, with an example of model graphical output in Figure 2-6.

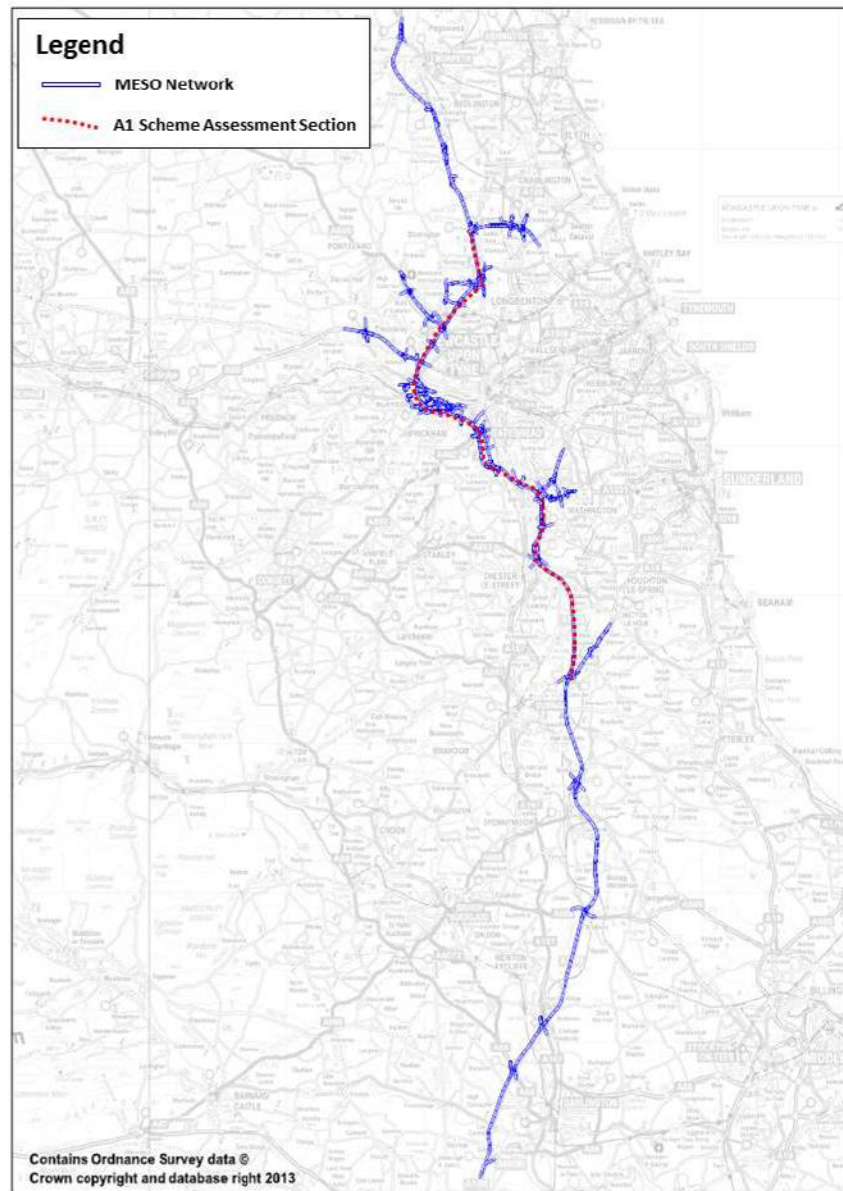


Figure 2-5: A1 Mesoscopic Model Network Coverage (Source: A1 RBS study)

- 2.18.3 The demand information used to populate the 2012 model was derived from Bluetooth surveys. These capture vehicles with mobile devices as they enter and leave the cordoned network. As such, they do not represent true origins and destinations.
- 2.18.4 The model was conceived as being a basis for the assessment of the impacts of local authorities Local Development Plans on the SRN. It has been used for the assessment of minor schemes such as the pinch point scheme at Seaton Burn, and a LNMS scheme at Birtley, however it was advised by the HA's Traffic Appraisal, Modelling and Economics team (TAME) that the mesoscopic model would not be suitable for the assessment of scheme options proposed on the stretch between the Scotswood and Kingston Park Road interchange for full economic appraisal, given the likely wider impacts. Therefore, it would be considered suitable for consideration of high level feasibility analysis of alternative options, which would then have to be considered in more detail with different tools.

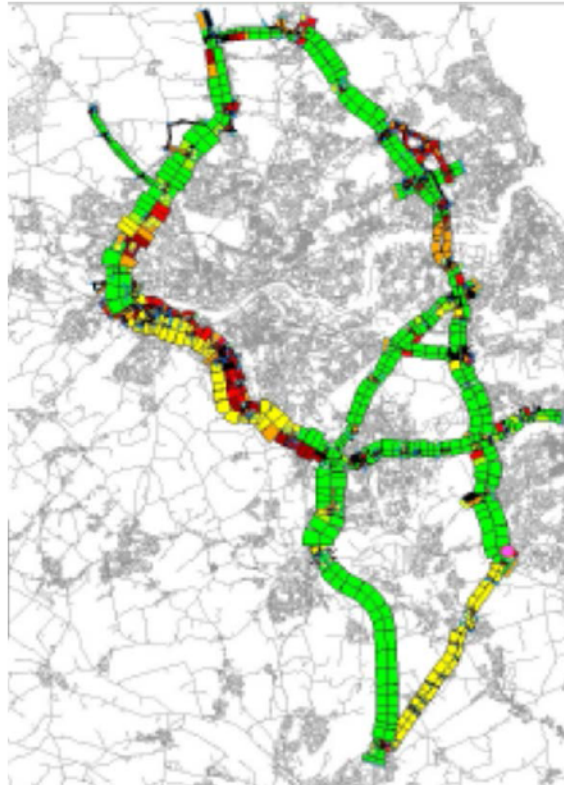


Figure 2-6: Example of NESMM graphical output (Source: Newcastle Infrastructure Study, 2011)

2.19 Summary and Conclusions on Available Transport Models

- 2.19.1 Table 2.2 presents a summary of different aspects of the models in relation to their potential use in informing the initial feasibility analysis of potential schemes in the A1 NGWB corridor.
- 2.19.2 The review does not imply any criticism of the models, and the comments here do not imply that they may not be considered fit for the purpose for which they were constructed. Based on the evidence presented in Table 3.1, use of either TPM3 or the A1 Lobley Hill SATURN model for the initial feasibility work would require significant updates to the models. Scheme testing would involve significant model run time, as TPM3 runs would also be required for an extended SATURN model. The amount of time required to update and run these models means that this could not be achieved within the timescale constraints of this feasibility study.
- 2.19.3 NESMM is a modelling tool which is available for use with coverage of the feasibility study corridor. It is based on recently collected travel demand data, and, as a validated model, can provide reliable estimates of journey time benefits.

| | TPM3 (TRIPS/CUBE) | A1 Lobley Hill (SATURN) | Mesoscopic (Dynameq) |
|--|---|--|---|
| Base Year | 2009 - with underlying OD data from 2005 | 2013 | 2012 |
| Coverage | Entire study area | Limited – to A1 between Blaydon Bridge and Eighton Lodge | Covers whole corridor with feeder roads at each junction |
| OD Data | Needs updating – age is outside window of acceptability | Up to date surveys but does not include entire corridor | Up to date surveys includes entire corridor |
| Count Data | Needs updating | Insufficient coverage full set of count data required for extended model | Recent Count Data used |
| Network Coding | Needs to incorporate any post 2009 changes | Insufficient coverage – extended network would need to be coded | No additional data required |
| VDM | Yes | No – in the A1 Lobley Hill to Dunston scheme TPM3 was used for VDM impacts | No – could use elasticities |
| Re-Routing | Yes | Limited – restricted to very localised rerouting | Very limited – network limited to A1 & feeder roads at every junction |
| Journey Time Benefits | Yes | Yes – restricted by model coverage | Yes |
| Time Periods | AM IP PM | AM IP PM | AM PM |
| User Classes / Vehicle Types | 5 | 2 | 2 |
| Run Times | Long (30+ hours) | Minimal for assignment Long where TPM3 is required | Minimal (1 hour) |
| DMRB Convergence Criteria | Yes | Yes | Yes |
| DMRB Link Flow Validation | Yes – but limited counts on A1 included | Yes | Yes |
| DMRB Journey Time Validation | Yes – limited consideration of A1 corridor | Yes | Yes |
| Availability of Resources | Unknown but likely to be restricted | No – extending the model will exceed current time constraints | Yes – model runs required only |
| Suitability for initial HA Scheme Assessment | No – out of date | Yes – limited to model length | Yes |
| Suitable for full HA Scheme Assessment including economics | No – out of date | Yes – limited to model length | Yes – small scale limited schemes only |

Table 2-2: Existing Model Features

- 2.19.4 NESMM is not without limitations, which are listed below, however, though they are not considered as having a significantly detrimental effect at the feasibility stage.
- Lack of an Interpeak model. TAME has advised that the outputs from AM and PM peak models will suffice for this study and an indicative non-validated Interpeak can be developed based on AM and PM matrices;
 - No traffic reassignment facility. The evidence from the A1 Lobley Hill to Dunston modelling is that in there is very little traffic reassignment from a scheme of that scale and that the main beneficiaries of the scheme are A1 users. (The modelling framework approved for that study was predicated on the major impacts being in the area encompassed by the SATURN model);
 - Lack of a Variable Demand Modelling (VDM) facility. An elasticity-based approach has previously been adopted to other projects on behalf of the Agency. It is considered that this approach will be investigated for use within this feasibility study.
- 2.19.5 As a result, a multimodal approach is not proposed at this stage, though the potential for public transport and active mode interventions to contribute part of the response to the issues and challenges is noted, in particular with respect to the recently commenced study regarding the Leamside Line. Likewise the possibility of public transport interventions elsewhere to potentially exacerbate the issues by displacing traffic from the LRN to the SRN demand is a critical concern.
- 2.19.6 The conclusion is that in the time available, the NESMM is the only practical choice for the appraisal of options for this study. It will provide the information required for initial economic appraisal and production of the Strategic Outline Business Case (SOBC).

2.20 Summary and Conclusions

- 2.20.1 The corridor has been the subject of a number of studies over recent years, and a number are ongoing. In summary:
- The importance of the A1 NGWB in assisting the economic performance of the corridor, and the region as a whole, is a recurrent theme;
 - The key issue identified by previous work is traffic congestion on the A1 NGWB and its impact on journey time reliability along the corridor;
 - The degraded operation of the corridor is considered to be a major barrier to future economic development of the area;
 - The studies have proposed a number of potential improvements to the highway network, and the Lobley Hill to Dunston Scheme (incorporating extensions to Coalhouse and Metrocentre) has been recently approved and construction commenced in August 2014;
 - There are potential public transport improvements in the corridor, such as the reopening of the Leamside Line, which have been considered by previous (and current) studies and which could have some impact on modal shift for certain travel movements in the corridor; and

- There are a number of traffic models available for the modelling and appraisal of potential corridor interventions, and the mesoscopic model would appear to be the optimal choice for initial consideration of highway improvement options.

3 Current Situation

3.1 Introduction

3.1.1 Chapter 3 of this study presents the analysis of the current situation in the study area, in particular:

- Current transport and other policies;
- Current travel demand and levels of service; and
- Current opportunities and constraints.

3.1.2 In doing so, it seeks to consider the current performance of the local road network and rail services. The analysis is based on:

- Data collected as part of the RBS process, together with analysis of other available study work; and
- Information gathered through informal engagement with stakeholders.

3.2 Current Transport and Other Policies

3.2.1 The following policies and documents provide the policy context for this study.

3.3 National Strategies and Policies

National Infrastructure Plan

3.3.1 The National Infrastructure Plan, cited previously, sets the following objective for the road network:

The government is committed to developing and maintaining a road network that will facilitate people's day-to-day activities, drive economic growth and meet the needs of road-users now and in the future. In particular, it is focused on:

- Addressing road quality, increasing capacity and tackling congestion

Investing in Growth

3.3.2 Investing in Growth was published by the HM Treasury in June 2013. Reporting the outputs of the mid-term review of Government spending, it set out a commitment to identifying and funding solutions to tackle some of the most notorious and longstanding road hotspots in the country. Amongst the feasibility studies announced was this study, looking at the A1 Gateshead Newcastle Western Bypass.

Draft National Policy Statement for the National Road and Rail Networks

3.3.3 The Consultation on a Draft National Policy Statement for the National Road and Rail Networks was published by the Department for Transport in December 2013. This again cited transport as "an engine for growth". The Government's vision and strategic

objectives for the national networks are as follows:

The Government will deliver national networks that meet the country's long term needs, supporting a prosperous and competitive economy and improving overall quality of life, as part of a wider transport system. This means:

- Networks with the capacity and connectivity to support national and local economic activity and facilitate growth and create jobs;
- Networks which support and improve journey quality, reliability and safety;
- Networks which support the delivery of environmental goals and the move to a low carbon economy; and
- Networks which join up our communities and link effectively to each other.

3.4 Key Regional Policies and Plans

North East Strategic Economic Plan

3.4.1 The North East Strategic Economic Plan (SEP) was published by the North East Local Enterprise Partnership (LEP) on 9th April 2014. The title sets out the driving focus of the plan "More and Better Jobs". It notes that growth has returned to the North East; indeed Gross Value Added (GVA) growth has exceeded that of any other local enterprise partnership area over the last three years.

3.4.2 The vision is that:

By 2024, our economy will provide over one million jobs.

3.4.3 This represents 100,000 new jobs and an increase of 11% in employment. The SEP cites the 2013 North East Independent Economic Review, undertaken by Lord Adonis. This reached the following conclusions:

- The North East has an absolute shortage of jobs;
- Productivity is a problem;
- Skill levels are not good enough; and
- Connectivity, locally, nationally and internationally needs to be improved to help open and strengthen the North East's economy.

3.4.4 The plan is more specific about transport than the LEP's 2011 draft Transport Strategy, and notes that there are a number of important development sites where new development is constrained by transport issues. It welcomes the Government's announcement of the Lobley Hill Improvement Scheme which "will address one of the worst single congestion points on the A1 Western by-pass, itself one of the most congested pieces of dual carriageway in the country".

3.4.5 The following are cited as key priorities for action with Government:

- Ongoing investment in a reliable strategic road network with reduced congestion. Key priorities are known bottlenecks on the A1;
- Deliver a programme of improvements on the A1 including the Lobley Hill scheme, the renewal of Allerdene Bridge, and the A1/A19 Seaton Burn Interchange; and

- Secure a rolling programme for additional capacity along the whole length of the A1 Western Bypass, with the objective of dual three lanes along all of its length, excluding Blaydon Bridge².

3.5 Key Local Plans and Policies

Local Plans

- 3.5.1 Gateshead Borough and Newcastle City Councils are currently in the final stages of the Local Plan preparation and approval process. The plan, entitled *Planning for the Future Core Strategy and Urban Core Plan for Gateshead and Newcastle upon Tyne* The One Core Strategy, was submitted in February 2014 and the EIP took place in summer 2014.
- 3.5.2 Local Plans for Northumberland and County Durham are not at such an advanced stage; the former is at Consultation Draft stage, the latter at Pre-Submission Draft. The content of these plans, and their implications for the SRN are considered further in Chapter 4.

Local Transport Plan

- 3.5.3 The current local transport plan for Tyne and Wear was produced in 2011. The third such plan, it covers a period of ten years from 2011 to 2021. It was produced by the Tyne and Wear Integrated Transport Authority on behalf of the five Tyne and Wear local authorities; (Gateshead, Newcastle, North Tyneside, Sunderland and South Tyneside) plus the Tyne and Wear Passenger Transport Executive (NEXUS).
- 3.5.4 The plan is complementary to the North Eastern LEP transport strategy, and was subject to public consultation. It set out the strategy for transport in the county over the ten years, and is accompanied by a more detailed strategy for delivery over the period.

3.6 Current Travel Demand and Levels of Service

Existing Road Infrastructure

- 3.6.1 The A1 NGWB generally comprises of dual two lane all purpose (D2AP) carriageway, with some dual three lane sections between adjacent junctions, and a climbing lane at Bowes Incline southbound.
- 3.6.2 The Gateshead and Newcastle sections of the route differ in standard. The section south of the river, between J65 Birtley and J73 Derwenthaugh, was originally constructed as the A613, a local bypass for Gateshead, opening in 1976. It was built to various non-standard cross-sections along its length.
- 3.6.3 The Gateshead Western Bypass was designated as part of the A1 upon the opening of the Newcastle Western Bypass between J73 and J80, and Blaydon Bridge in 1990, the designation moving from what is now the A19/ A194(M) corridor via the Tyne Tunnel.
- 3.6.4 The Newcastle Western Bypass was built to full DMRB standard, with consistent cross sections throughout, though, as with the Gateshead bypass, it has a number of closely spaced junctions which cause weaving issues and turbulence in traffic flow. In total, there

² Although the document refers to excluding the bridge over river and ECML from three lane sections, the aim in the paragraph above refers to Allerdene Bridge, which is the crossing over the ECML. If/when replaced, this would offer an opportunity to deliver three lanes.

are 16 junctions, including J80 Seaton Burn and J65 Birtley, within the 25km extent of the bypass.

3.6.5 The route has a posted speed limit of 50 mph between Eighton Lodge and Derwenthaugh, with the National Speed Limit applying on the remainder of the route. The introduction of the 50mph speed limit facilitated a scheme to provide three narrow lanes through the Dunston Road junction northbound. The route is lit throughout.

3.6.6 The study section between J62 Carrville and J65 at Birtley is dual two-lane motorway (D2M) between Junction 62 and Junction 63, and then dual three-lane motorway between Junction 63 and the bifurcation with the A194(M) at Birtley. The section J62 to J63, part of the Durham Motorway, was opened in 1969. The remaining section, the Birtley Bypass, was opened in 1970 along with the A194(M).

3.6.7 A ban on slow moving vehicles on a section of the A1 NGWB was introduced between Seaton Burn and Birtley in 1999. This applies as follows:

Any vehicle which cannot attain a speed of 30mph on the level in free-flowing conditions will be prohibited from entering the A1 Gateshead and Newcastle Western By-Passes. This will include the sections between Lobley Hill, the Tyne Crossing at Blaydon and North Brunton. The ban, when introduced, will be in force between the hours of 7am to 9am and 4pm to 6pm from Monday to Friday.

This was in response to the “considerable peak hour congestion that occurs on the A1 in Tyneside” (Parliamentary Written Answer, Hansard 19/01/99).

3.7 Performance Indicators

3.7.1 In this section, the demands on, and level of service and capacity offered by the A1 between J62 Carrville and J80 Seaton Burn are investigated. This utilises data provided by the Regional Intelligence Unit (RIU), and is the data that fed into the Highways Agency’s internal Regional Network (RBA) 2012 report. It was also used to inform the A1 West of Newcastle RBS. It is noted that the RIU link sections used in some cases encompass an intermediate junction. For example a single RIU link covers J75-J77.

3.7.2 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 air quality, pedestrian incidents, incidents involving a lane closure and breakdowns.

3.8 Traffic Flows – Annual Average Daily Traffic

3.8.1 The data visualised in Figures 3.1 and 3.2 is annualised from data covering the period October 2009 to September 2011. The most heavily trafficked sections are between J69 Askew Road and J68 in both directions, closely followed by J65 Eighton Lodge to J66 Lobley Hill. All links exceed the Northern of England (NW, NE, Y&H) benchmark for Dual Links. It is noted that the benchmark includes 3-lane links, and that the A1 NGWB is largely comprised of 2-lane links. This illustrates the high level of demand experienced on certain sections of the network.

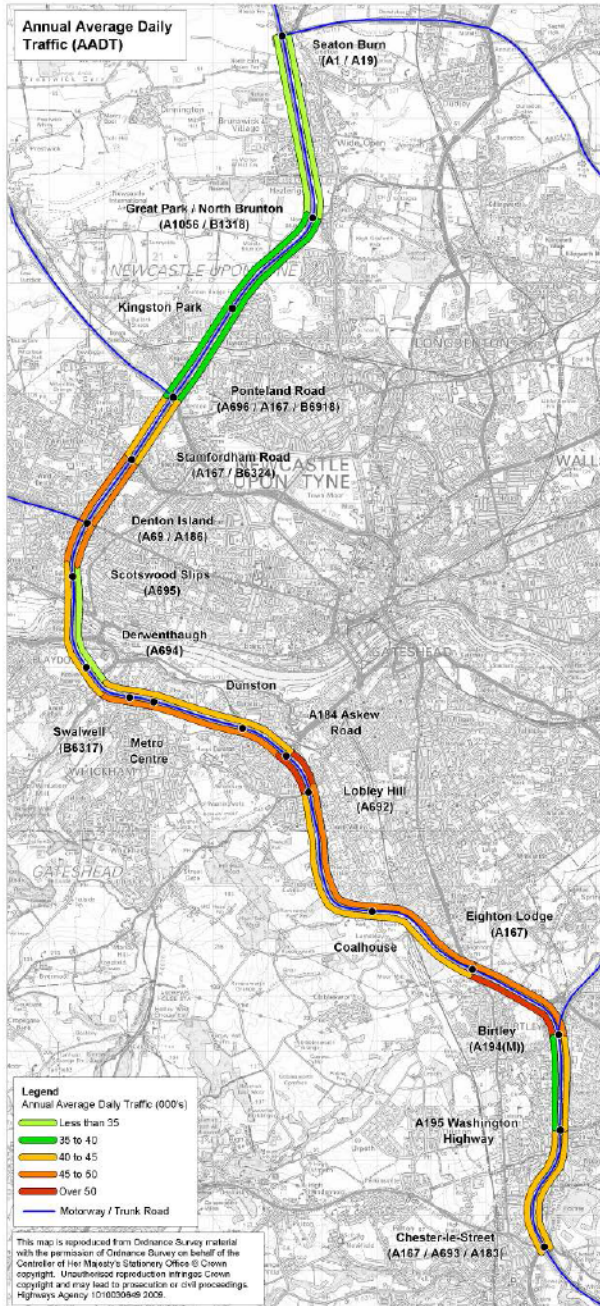


Figure 3-1 Annual Average Daily Traffic

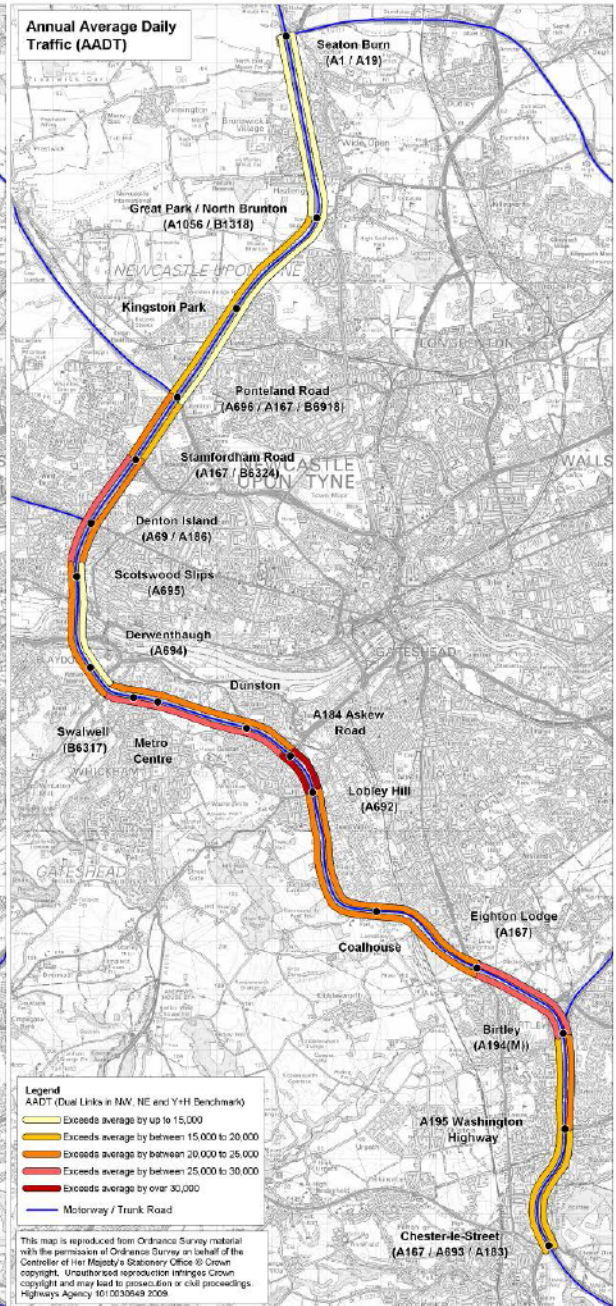


Figure 3-2 ...compared to North of England benchmark

3.9 Average Monthly Vehicle Hour Delay

3.9.1 The data shown in Figure 3.3 is annualised from data covering the period October 2009 to September 2011. The Gateshead bypass between J65 and J73 experiences the worst overall delay, particularly in the southbound direction, where the average monthly vehicle hour delay is over 4000 hours per km. The northbound direction exceeds this threshold between J66 Eighton Lodge and J69 Askew Road. For the Birtley to Eighton Lodge link, which shows lower levels of delay, the bottleneck occurs at the merge from the A1231 in the AM peak. It is noted that, due to relative free flow outside the AM peak period, the monthly metrics do not clearly capture this.

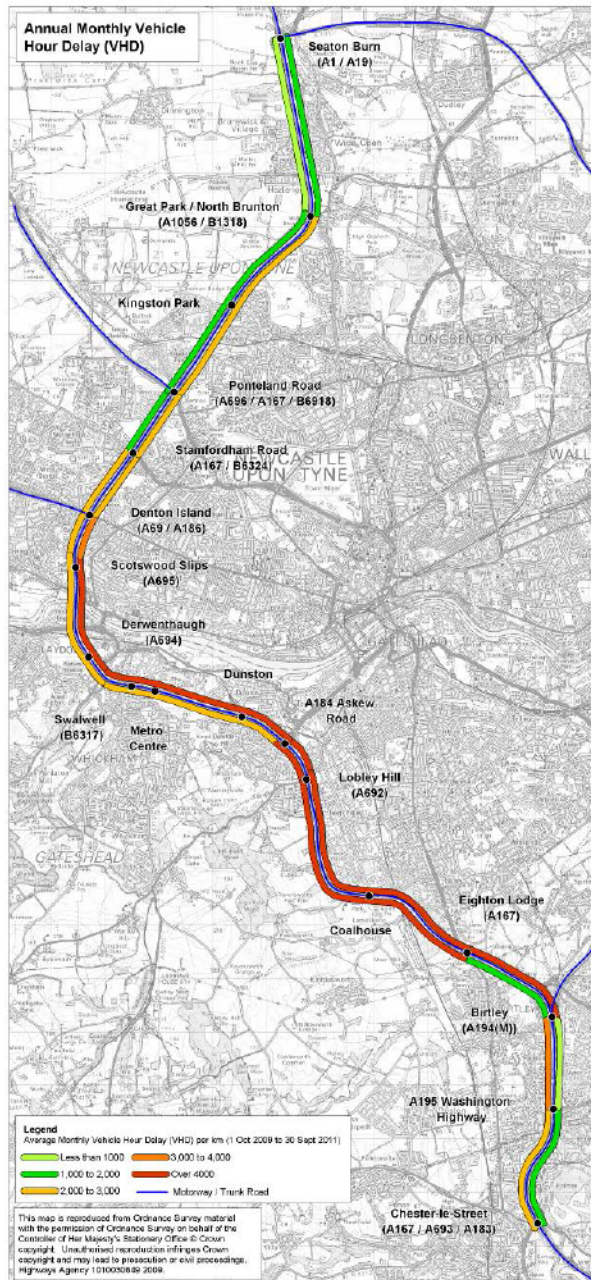


Figure 3-3 Average Monthly Vehicle Hour Delay per km

3.10 Percentage of Reduced Capacity Hours

3.10.1 Reduced Capacity Hours are defined as traffic conditions where vehicles are travelling at a speed below the speed at link capacity. Under these traffic conditions, link throughput is reduced due to flow breakdown, with queuing and stop-start conditions resulting. It is seen that the southbound carriageway is much more affected than the northbound, with

particular issues on the Gateshead section approaching J68 Lobley Hill, and again approaching J65 Birtley.

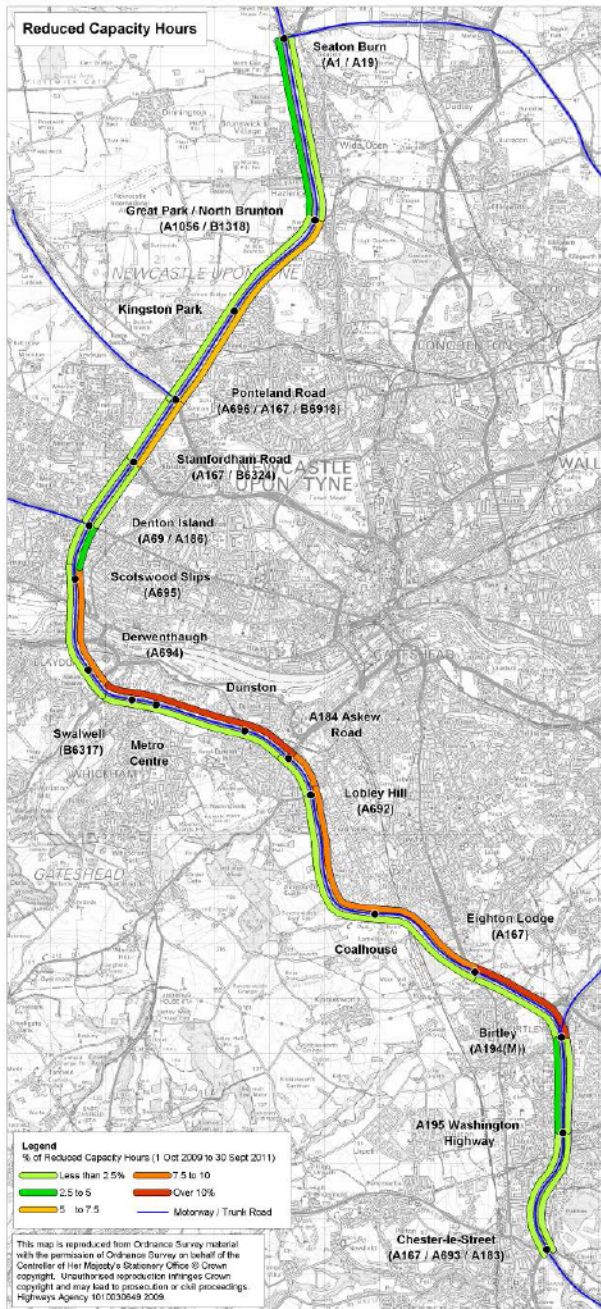


Figure 3-4 % of Reduced Capacity Hours

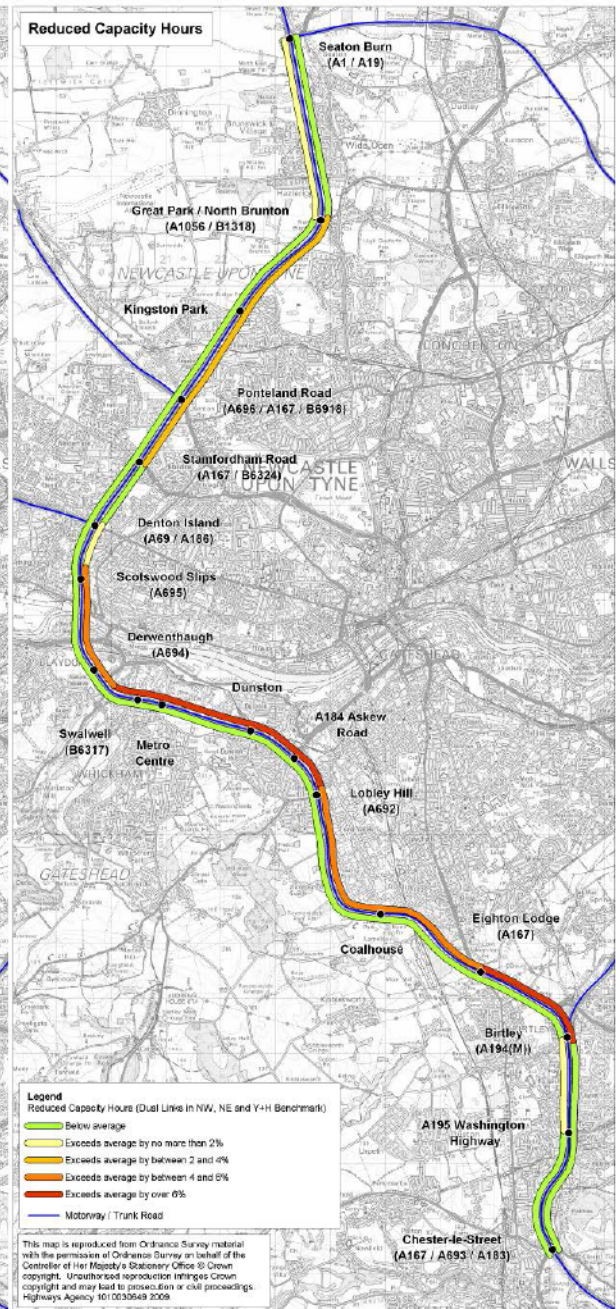


Figure 3-5...compared to North of England benchmark

3.11 On-time Reliability Measure

- 3.11.1 'On-Time' refers to journey times for a link that are equal to, or less than the defined free flow speed of a link. The reliability measure is shown as a percentage of Link Transit Times (LTT) that are on-time. It illustrates where congestion and flow breakdown causes journey time unreliability. This shows that only the section between Eighton Lodge and Birtley, in both directions, and between North Brunton and Seaton Burn northbound exhibit an on-time reliability of more than 70%. The southbound stretch between Derwenthaugh and Askew Road, and northbound between Lobley Hill and Askew Road have less than 50% on-time reliability. The benchmarking shows that, compared to North of England benchmark data, the A1 NGWB performs poorly, with the Lobley Hill to Swalwell stretch worst performing and having a reliability over 25% lower than the national benchmark.

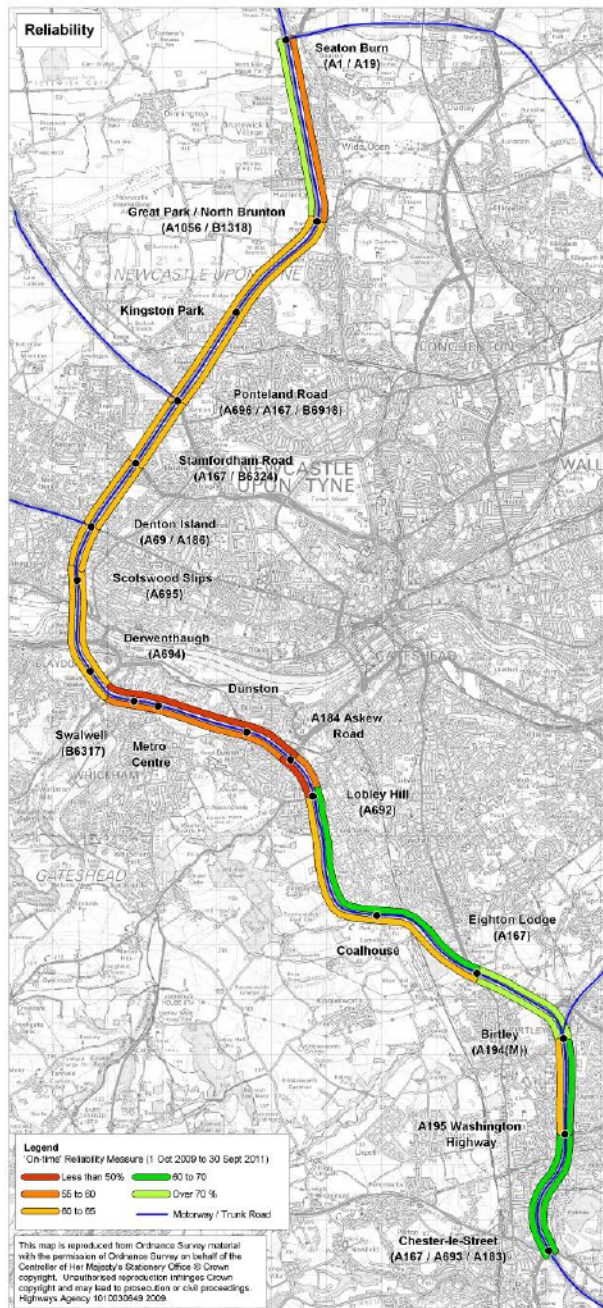


Figure 3-6 On-time Reliability

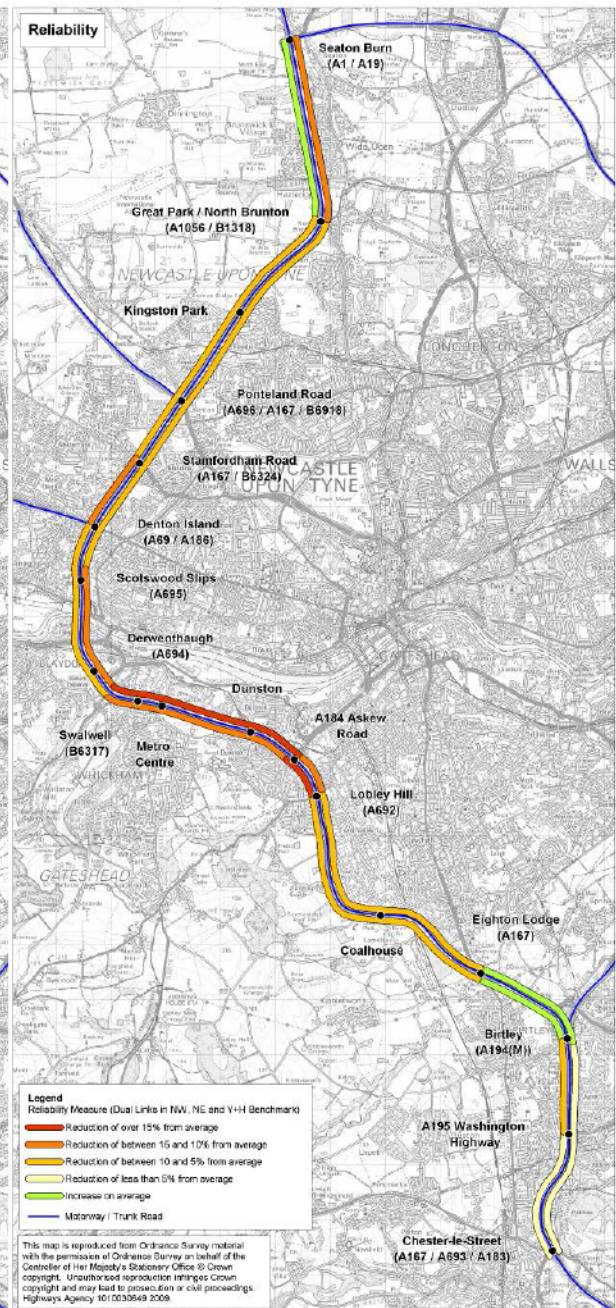


Figure 3-7...compared to North of England benchmark

3.12 Killed or Serious Injury (KSI) per km

3.12.1 The northbound link between Birtley and Eighton Lodge has the worst record on the KSI indicator, with more than 3 people killed or seriously injured per km in the years 2008 - 2010. The remainder of the A1 NGWB as far north as Lobley Hill falls in the 2-3 category, in each direction. Both carriageways have over 1 more casualty than the northern benchmark in this section. The section between Askew Road and Lobley Hill actually has lower than benchmark KSI casualties, though this is probably due in part to the low speeds experienced through this section. Further north, the only section below benchmark is that between Derwenthaugh and Denton in both directions. The Denton Island to Stamfordham Road section northbound shows an increase of over 1 KSI on average as compared to the

northern benchmark.

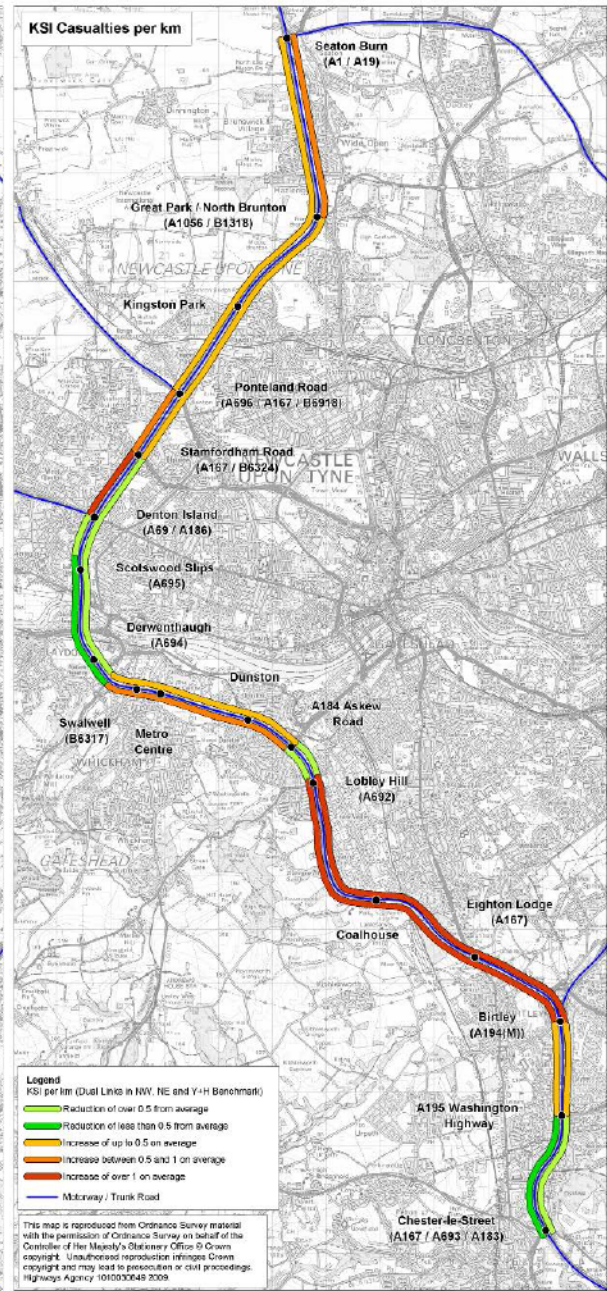
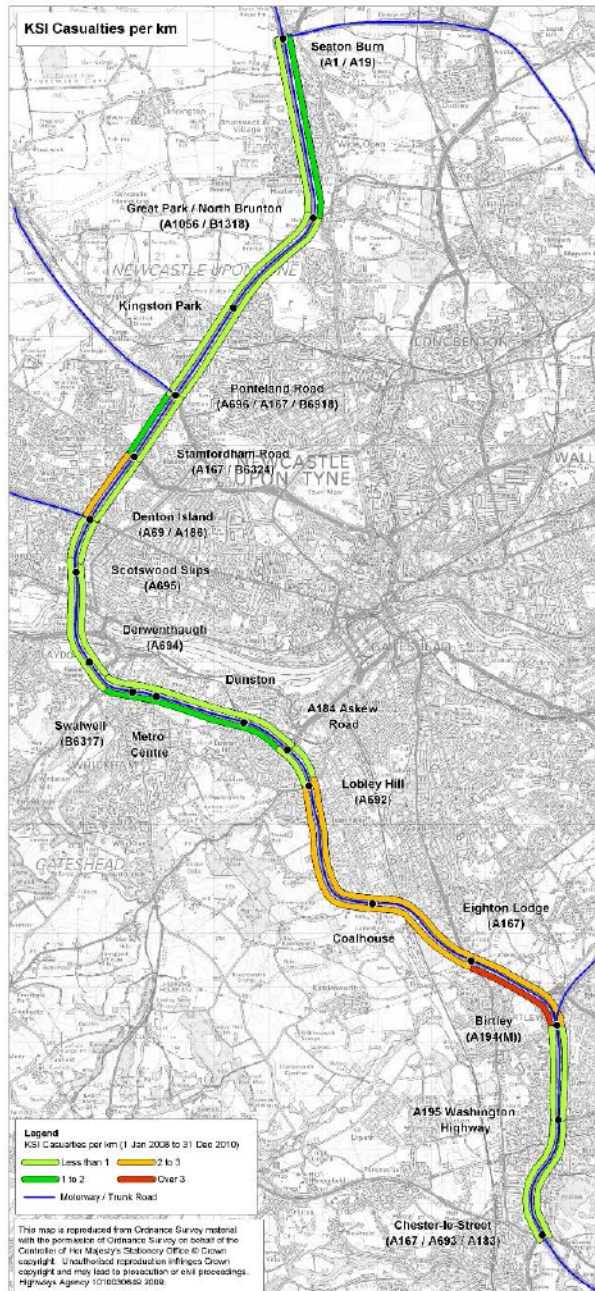


Figure 3-8 KSI per km, 2008 – 2010

Figure 3-9 ...compared to North of England benchmark

3.13 Casualties per Billion Vehicle Miles

3.13.1 This metric includes all injuries and takes into account the flow on each link. A similar pattern is seen to the KSI metric. The weaving section between Eighton Lodge and Birtley is seen to perform poorly, as is that between Denton Island and Stamfordham Road. The former has over 1200 casualties per billion miles for this measure, the latter between 900 – 1200. Benchmarked against the north of England dual links, these links have over 400

casualties per billion miles more. The remainder of the Gateshead Bypass (J65-J73) also performs worse than the benchmark, with the exception of the southbound carriageway between J73 Derwenthaugh and J69 Askew Road.

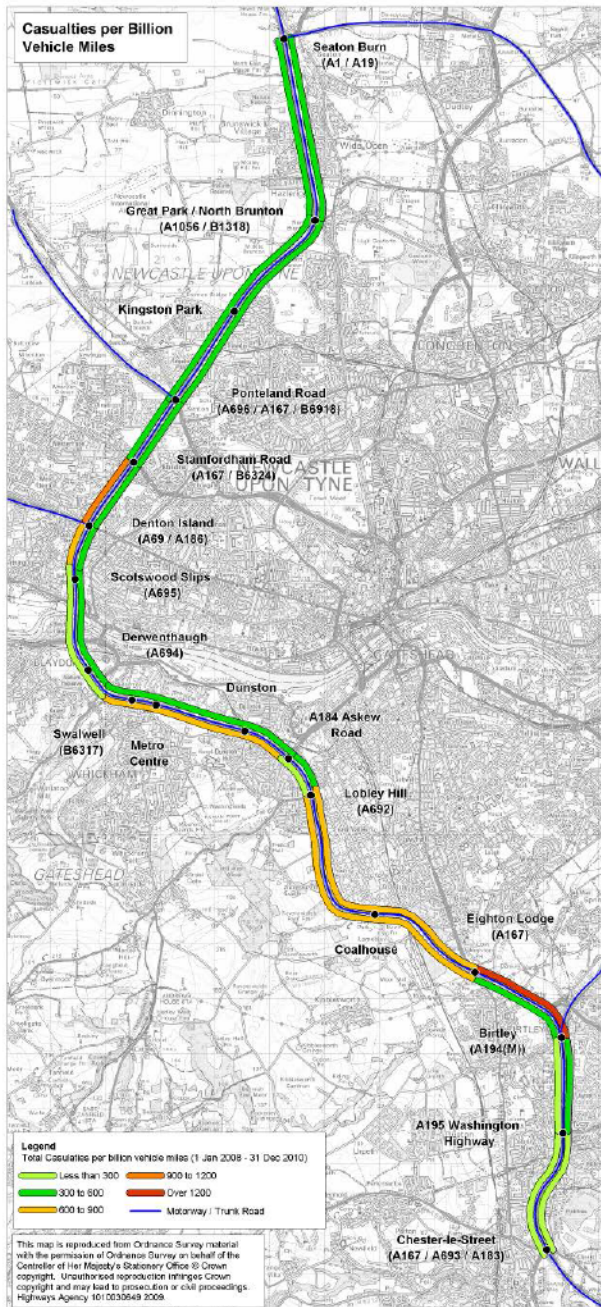


Figure 3-10 Casualties per Billion Vehicle Miles

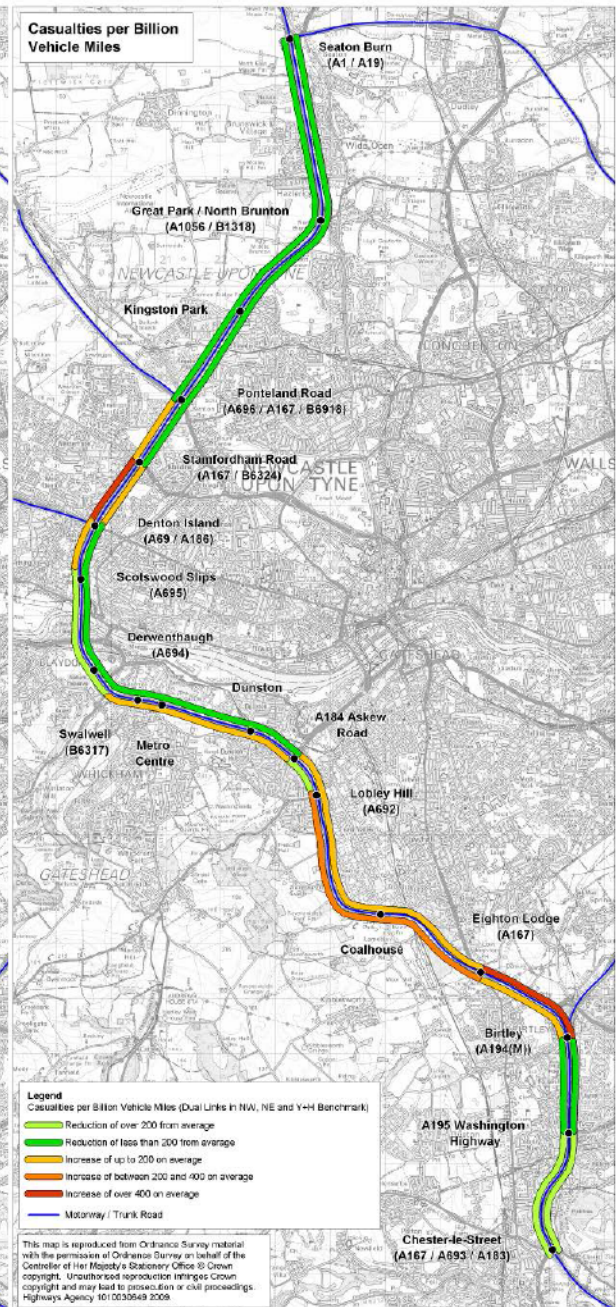


Figure 3-11 ...compared to North of England benchmark

3.14 Road Traffic Collisions per kilometre

3.14.1 Including all collisions, this metric highlights the weaving sections between Askew Road and Lobley Hill, and between Scotswood Slips and Denton Island. Notably, these sections were not highlighted in the previous accident data. It is likely that the collisions which occur in these weaving sections are at lower speed, due in part to congestion, and therefore more likely to be damage only collisions, which nevertheless can cause significant disruption and delays. The same stretches of the network are highlighted by the benchmarking, with almost the whole A1 NGWB exceeding the benchmark. The stretch between Lobley Hill and Denton Island performs poorly in general. On the A1(M) section of the study corridor, the section northbound between Junction 64 and Junction 65 has recorded the worst performance.

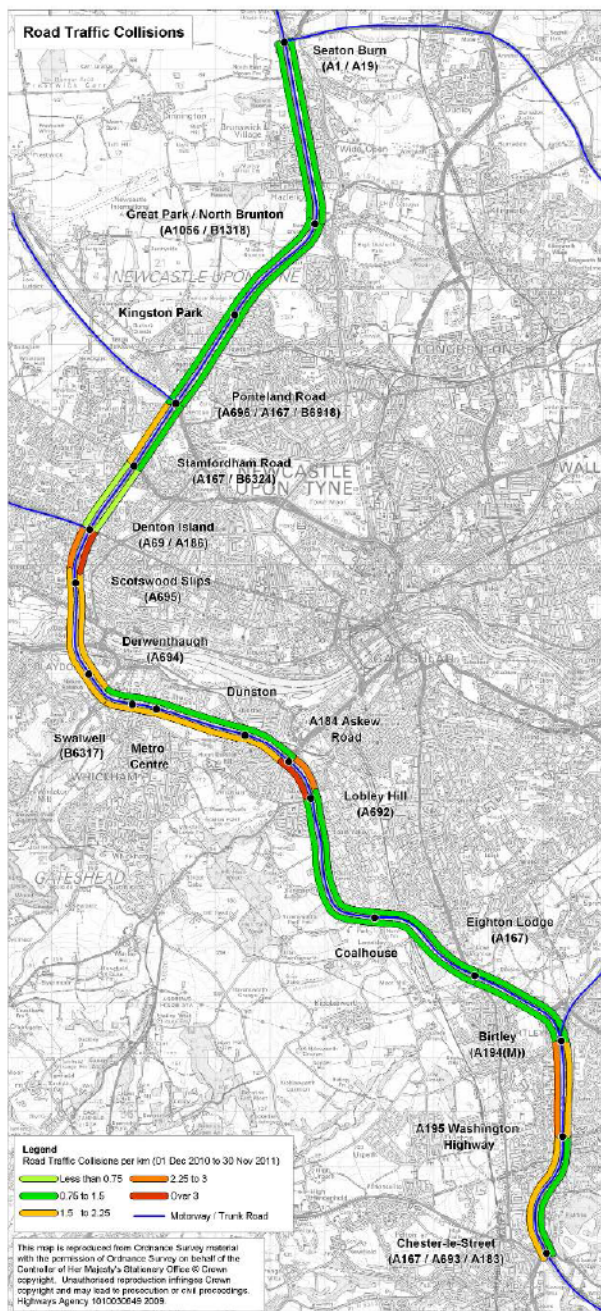


Figure 3-12 Road Traffic Collisions per km

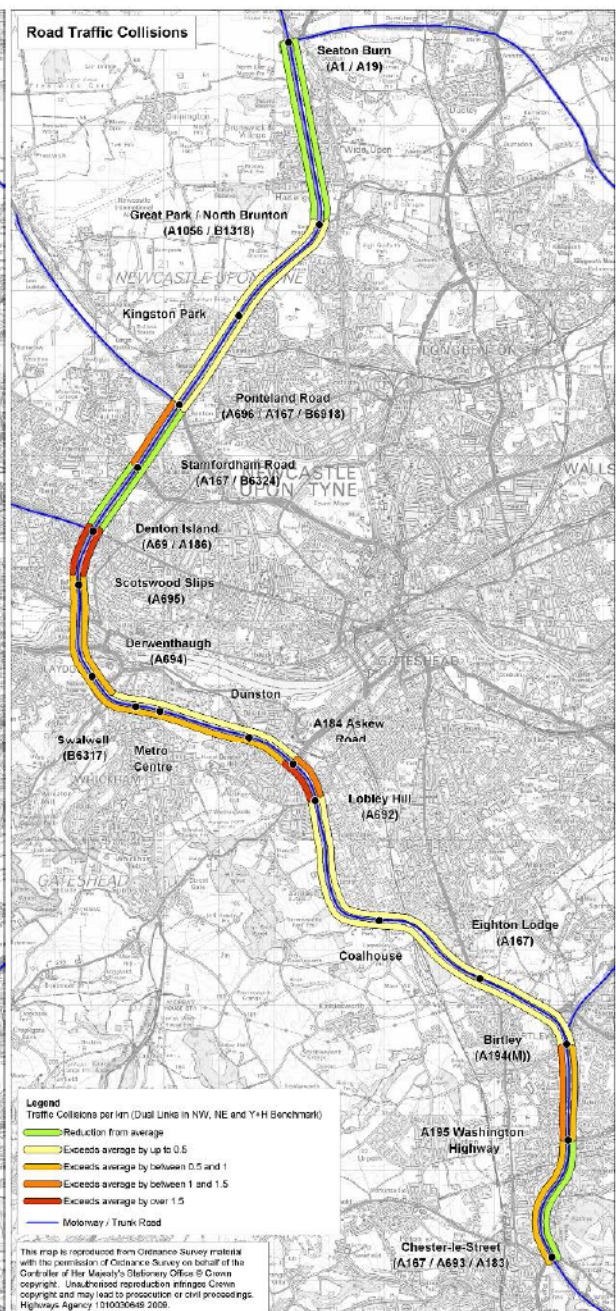


Figure 3-13...compared to North of England benchmark

3.15 Air Quality

3.15.1 The data for Air Quality shows where Nitrogen Dioxide (NO₂) emissions are predicted to be higher than the limit set by the European Union (EU), based on the annual limit of 40 µg/m³. The values shown are based on the highest value either on the road link itself, or adjacent to it. This suggests that there are significant stretches of the A1 NGWB where emissions are in excess of these limits.

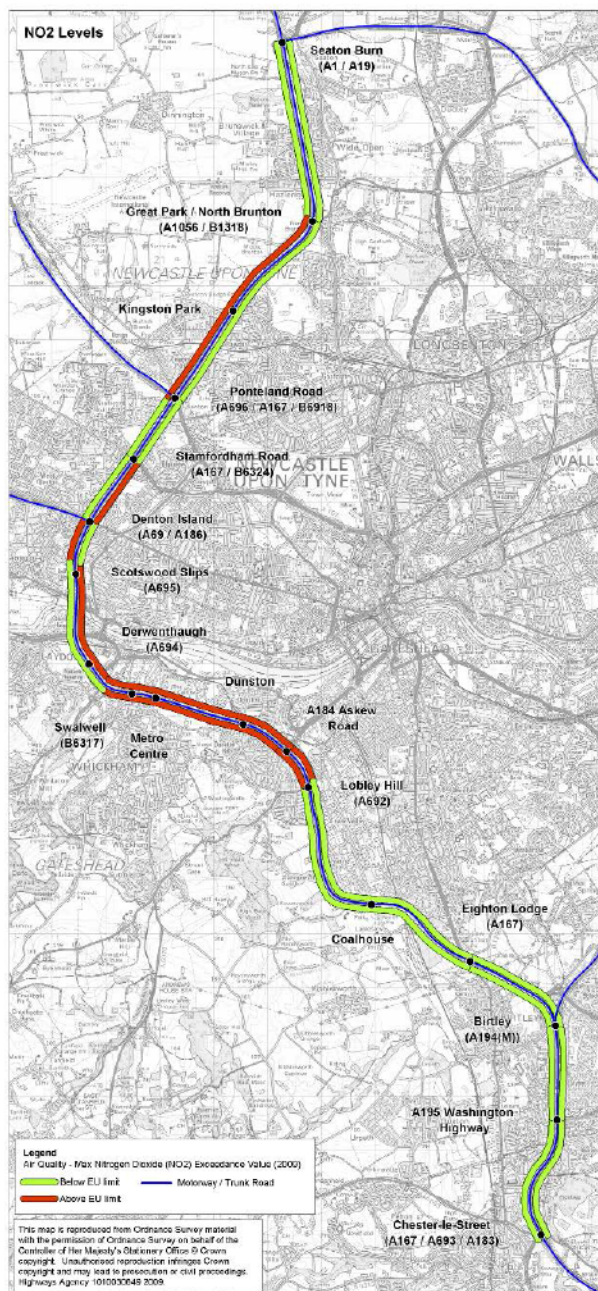


Figure 3-14 Air Quality

3.16 Pedestrian Incidents

- 3.16.1 The A1 NGWB does not have footpaths and, therefore, the number of pedestrian incidents is of particular concern. They are concentrated on the southbound carriageway of the Gateshead section, between J73 Derwenthaugh and J66 Eighton Lodge in particular. The fact that the southbound section between Derwenthaugh and Askew Road saw the highest number of pedestrian incidents, whereas the adjacent northbound carriageway has zero, suggests that the incidents are not occurring due to pedestrians attempting to cross from one side of the road to the other. These incidents are probably due to people getting out of broken down vehicles, or vehicles involved in incidents and then being hit by other vehicles.

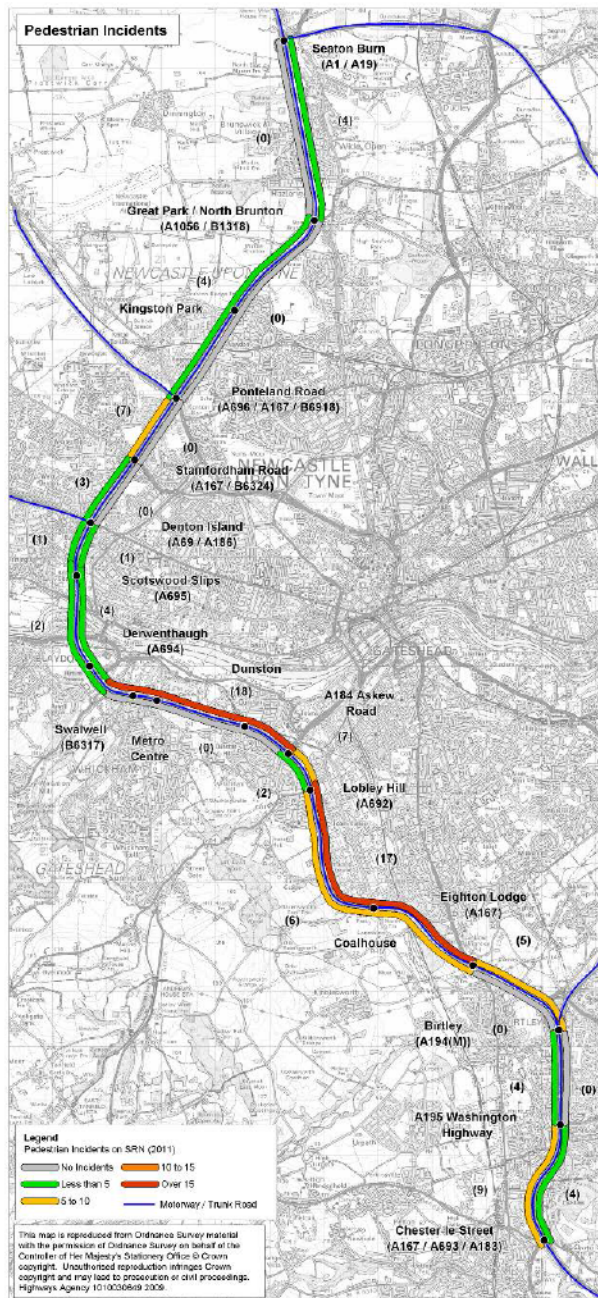


Figure 3-15 Pedestrian Incidents

3.17 Incidents involving a Lane Closure 3.18 Breakdowns per km

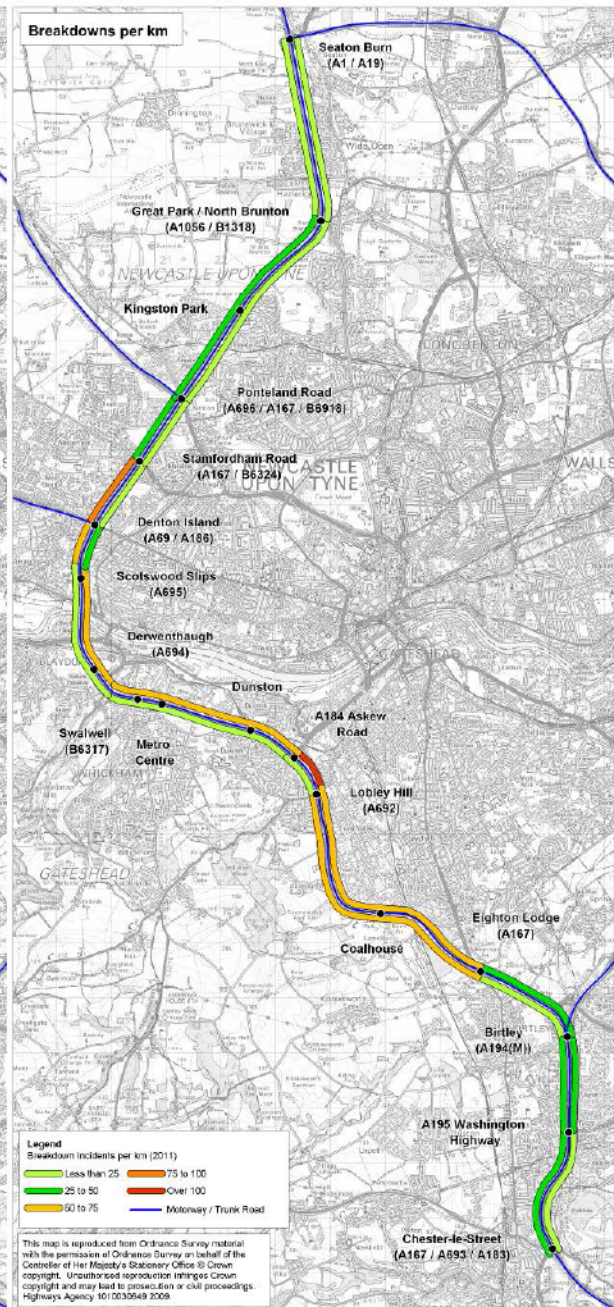
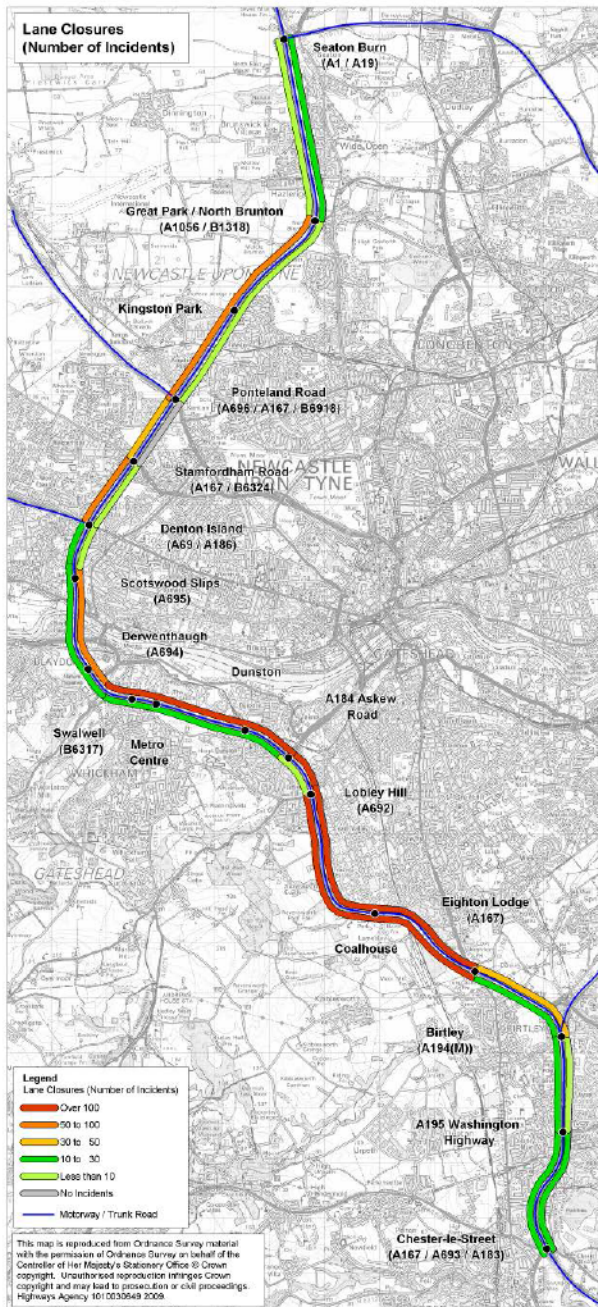


Figure 3-16 Incidents involving a lane closure

Figure 3-17 Vehicle breakdowns per km

3.18.1 The data for lane closures closely resembles the average hour monthly delay plot, as does that for vehicle breakdowns per km. Given the traffic volumes and the tight cross section of the carriageway, responding to incidents and vehicle breakdowns is difficult. Indeed, the Agency has a Special Retriever deployed in the corridor to aid in vehicle recovery. This is due to, and indicative of, the particular operational issues given the demands on, and configuration of, the corridor.

3.19 Strategic versus local use

3.19.1 The Bluetooth and Automatic Number Plate Recognition surveys undertaken to provide demand information for the mesoscopic model reveal that there is very little through traffic using the A1 NGWB. During the survey periods of 0600-1000 and 1500-1900, the largest proportion of traffic observed passing through Seaton Burn, and subsequently passing Birtley was 4%, in the hour 0600-0700. From Birtley to Seaton Burn, the largest proportion was 2%. This suggests that the use of the A1 NGWB for strategic through trips is limited.

3.20 HGV Proportions

3.20.1 Analysis of TRADS data from October 2012 suggests that the percentage of HGVs in the total traffic volume is in the region of 6-10%. It is noted that this increases to 12% on the A1(M) immediately to the south of the study area.

3.20.2 The national percentage of HGV kilometres on Rural 'A' Trunk roads is 9%, and Urban 'A' Trunk roads is 6%. Therefore the A1 NGWB has a proportion of HGVs in line with the national average. The proportion on the motorway section also mirrors the national percentage at 11%, (*Road traffic (vehicle kilometres) by vehicle type and road class in Great Britain 2012*).

3.21 Rail

Services

3.21.1 The East Coast Mainline runs parallel to the A1 with stations at Durham, Chester-le-Street and Newcastle. Local services are however relatively poor. Whilst there are 4 trains per hour between Durham and Newcastle, three of them depart within 15 minutes of each other due to timetabling issues. Chester-Le-Street is only served by 1 train per hour.

3.21.2 The Tyne Valley Line passes along a section of the corridor. It serves stations at Dunston, Metrocentre and Blaydon as it runs from Newcastle to Hexham and Carlisle. Dunston and Blaydon received much improved rail services from December 2013. Dunston benefits from 31 trains a day Monday – Friday (up from 3), and 21 trains on a Sunday. Blaydon is now served by 20 services per day Monday – Friday (up from 4) and 12 trains on a Sunday. Given the crowding on the Tyne Valley line identified from recent surveys, the capability of these improved services to offer relief during the peak hour would appear limited.

Train Crowding

3.21.3 Information on current rail service crowding has been extracted from 'The Access to the Tyne & Wear City Region Study' which provides information with regards to rail capacity. A survey was conducted by NEXUS in 2009 of crowding levels during AM peak arrivals and PM peak departures from Newcastle Central station. This information is shown in Tables 3.1 and 3.2.

3.21.4 The report found that rail services had some capacity available although crowding is evident on particular services into Newcastle across all time periods, with a greater tendency for trains to be overcrowded in the AM peak. Peak hour Intercity rail services are generally only crowded for sections of their journeys within the North East towards Newcastle in the AM peak, and from Newcastle in the PM peak.

| Line | First Station | Time | % Full on Entry |
|--------------|---------------|-------|-----------------|
| Tyne Valley | Metro centre | 08:15 | 151% |
| ECML | Durham | 08:01 | 144% |
| ECML | Durham | 07:42 | 138% |
| Tyne Valley | Wylam | 07:45 | 120% |
| ECML | Durham | 08:36 | 118% |
| ECML | Durham | 08:16 | 100% |
| ECML | Durham | 09:13 | 100% |
| Tyne Valley | Metro Centre | 08:44 | 96% |
| ECML | Morpeth | 07:23 | 93% |
| ECML | Morpeth | 07:50 | 93% |
| ECML | Morpeth | 08:05 | 79% |
| ECML | Durham | 07:28 | 75% |
| ECML | Durham | 08:26 | 75% |
| ECML | Durham | 09:39 | 75% |
| Durham Coast | Heworth | 08:43 | 74% |
| ECML | Morpeth | 08:32 | 73% |
| Durham Coast | Heworth | 08:07 | 54% |
| Durham Coast | Heworth | 09:43 | 54% |
| ECML | Durham | 09:22 | 50% |

Table 3-1: Train Crowding, Newcastle AM Peak Arrivals 2009

| Line | Station | Time | % Full on Exit |
|--------------|-------------------|-------|----------------|
| Durham Coast | Heworth | 17:37 | 119% |
| ECML | Durham | 17:34 | 114% |
| Tyne Valley | MetroCentre | 18:03 | 101% |
| ECML | Morpeth | 17:39 | 100% |
| Tyne Valley | MetroCentre | 16:32 | 93% |
| Tyne Valley | MetroCentre | 17:21 | 78% |
| EMCL | Durham | 17:55 | 75% |
| Tyne Valley | MetroCentre | 17:35 | 70% |
| Durham Coast | Heworth | 16:38 | 66% |
| ECML | Durham | 16:48 | 64% |
| Durham Coast | Heworth | 15:39 | 57% |
| Tyne Valley | MetroCentre | 15:33 | 56% |
| ECML | Chester Le Street | 18:31 | 52% |
| ECML | Durham | 17:09 | 50% |
| ECML | Durham | 18:23 | 50% |

Table 3-2: Train Crowding, Newcastle PM Peak Departures 2009

Track Capacity

- 3.21.5 In terms of available track capacity, as reported in the East Coast Route Utilisation Strategy (RUS) and noted previously in Section 2.12, there are capacity constraint issues between Northallerton and Newcastle. Services are flighted, so as to maximise path capacity. This results in poor service spacing for local journeys.
- 3.21.6 The RUS notes that any increase in freight or passenger services, or optimisation of

passenger services to provide a more even spread is likely to exceed capacity.

3.22 Local Road Network

3.22.1 The Local Road Network (LRN), in Newcastle and Gateshead, as with the A1 NGWB, suffers notable peak time congestion. There are particular locations where, on occasion, capacity constraints on the local network impact on the operation of the SRN with queuing back onto the mainline. Locations where this has been observed are:

- A692 Lobley Hill Roundabout; and
- Maingate Roundabout, Team Valley.

3.22.2 This is expected to occur at more locations as further development is implemented and traffic levels grow. Team Valley and, in particular Coalhouse, Lobley Hill and Maingate Roundabouts are of particular concern, with issues in these locations having the potential to reduce markedly any benefits that will accrue from Metrocentre to Lobley Hill scheme.

3.22.3 The major issues are with radial movements to and from the regional centre. Major queues occur in the peaks on many of the LRN approaches to the A1 nodes where these radial movements intersect the SRN.

3.22.4 The A1 NGWB effectively forms part of a ring road around the regional centre, which is continued by the A1056 and the A194(M). There is no road in the LRN hierarchy below the A1 NGWB that performs the same function for orbital movements. The A1056 in particular is under particular pressure, and at times this can affect the operation of Junction 79 Great Park.

3.23 Stakeholder Consultation

3.23.1 The Highways Agency has worked closely with stakeholders in the local area over recent years, in particular with regard to Local Planning Authorities Local Development Framework proposals and their emerging Local Plans.

3.23.2 The Agency has responded to policy proposals and worked with Local Planning Authorities to assist in the identification of realistic and deliverable land use aspirations. It has worked with Local Planning and Highways Authorities to identify the trip making potential of these developments, the impacts at the strategic road network, existing network constraints and issues and the nature of the potential interventions that may be required in order to ensure that the development necessary for economic growth is not prejudiced by, or results in network capacity issues.

3.23.3 This work has resulted in a common consensus as to the issues affecting the area, and on the type and scale of interventions that would be required to alleviate these. In doing so, there was due regard to balancing the imperative to support and foster economic development while taking account of other factors such as environmental impacts, cost and deliverability.

3.23.4 A part of the RBS, a workshop was undertaken with key stakeholders. The list of attendees is shown in Table 3-3 representing both the public and private sector. The key message from the workshop was that the local stakeholders felt that the issues pertaining to the operation of the A1 NGWB were clear and agreed, and that as a result there is a perceived need to deliver additional road capacity within the corridor. The ultimate aim stated was the achievement of a dual three-lane A1 NGWB.

| Stakeholder Group |
|---|
| Department for Transport |
| Newcastle City Council |
| Newcastle City Council UTMC |
| Gateshead Council |
| North East Chamber of Commerce |
| Highways Agency – Network Services |
| Newcastle City Council |
| Durham County Council |
| North East Local Enterprise Partnership |
| Newcastle City Council |

Table 3-3: RBS Stakeholder Consultees

- 3.23.5 A further round of consultation has been undertaken as part of this study. This has taken the form of a series of telephone discussions with stakeholders as well as presenting the findings to the stakeholder reference group. Those consulted are listed in Table 3-4.
- 3.23.6 The stakeholders made clear that the issues and challenges in the corridor were widely known and universally accepted, had been discussed with the Agency on numerous occasions, and had been subject to a number of studies. They confirmed the latest plans and development aspirations for consideration in the study.
- 3.23.7 Stakeholder engagement by the Agency is ongoing relating to the emerging local plans, and other issues in the area, particularly the traffic implications of developments which continue to come forward.

| Stakeholder Group |
|---|
| North Tyneside Council |
| Gateshead Borough Council |
| Newcastle City Council |
| Durham County Council |
| North East Local Enterprise Partnership |
| City of Sunderland Council |
| South Tyneside Council |

Table 3-4 Stage 1 Study Consultees

3.24 Current Opportunities and Constraints

This section is concerned with identifying the physical, legal and institutional constraints, and, firstly, the opportunities affecting the study area.

3.25 Opportunities

Stakeholder consensus

- 3.25.1 The widespread stakeholder support for improvements to the A1 NGWB represents a major opportunity. Potential improvements to the A1 are seen as being a catalyst for growth and economic development in the corridor, and in Tyne and Wear as a whole. This consensus is underpinned by a clear understanding of the issues and the required solutions.

Proof of concept

- 3.25.2 The recent scheme to provide three lanes through the Dunston interchange, one of the most width constrained structures on the entire bypass has proved that widening is possible, while taking account of current infrastructural constraints in the corridor. This offers the hope that a lower cost scheme than full standard widening might be realistically deliverable in the corridor.

Committed Scheme

- 3.25.3 The extended Lobley Hill scheme will now see dual three lanes delivered between the Coalhouse and Metrocentre junctions. This represents a major advance towards the goal stated by the LEP, and shared by a broad coalition of stakeholders of a three lane A1 NGWB.

3.26 Constraints

Institutional constraints

- 3.26.1 Institutional issues relating to funding and deliverability have been the major constraint on improvements in the corridor to date, with numerous schemes developed over recent years, but falling at this hurdle. It is now considered that a full length scheme is unlikely to proceed as a single project, and a pipeline of schemes dealing with discrete sections will be the most effective way of delivering the aim.

Corridor constraints

- 3.26.2 The corridor itself is physically constrained, with development having occurred in Newcastle up to the reserved corridor for the Newcastle Western Bypass, and development having already occurred along sections of the alignment of the Gateshead Western Bypass. In particular, sections of the Newcastle Western Bypass run through concrete walled cuttings with residential development immediately adjacent, which pose particular constraints and challenges for widening. It is noted that, although the corridor had been reserved, 66 houses were demolished to facilitate its construction to modern standards, and some 1200 houses were provided with noise insulation (CIHT Motorway Archive).

Ownership

- 3.26.3 The majority of the junctions in the corridor are part of the LRN, and as such not the sole responsibility of the Highway Agency. In particular, it is noted that the Metrocentre to Coalhouse scheme does not involve any amendments to the junctions at the end of slip roads. Modelling suggests that some of these junctions will have difficulty coping with the increased throughput capability of the SRN and/or would be capable of passing addition traffic through from the LRN to the SRN so as to be make full use of the expanded capacity.

- 3.26.4 The interchanges at which the junctions at the end of the slips form part of the SRN, as opposed to LRN, are those where the A1 interfaces with other SRN routes, namely:

- J65 Birtley ((A194(M) south facing slips only);
- J75 Denton Burn (A69);
- J77 Ponteland Road (A696); and
- J80 Seaton Burn A19.

Structures

3.26.5 The major structures which provide crossings of rivers and rail lines represent major constraints on the aspiration for a three-lane corridor. It is considered that Blaydon Bridge crossing the River Tyne will remain a constraint due to the cost implications of replacement or widening. Derwenthaugh and Allerdene bridges, the former across the River Derwenthaugh, the latter across the East Coast Mainline are also constraints, as are the crossings of the Tees and Team. The River Team was diverted to run in an artificial channel through the centre of Eighton Lodge interchange.

3.26.6 Allerdene in particular is problematic, in that the current structure will need replacement in the near future due to corrosion issues. Replacing this on line, over a live railway line, would be challenging given site and location constraints, the need to maintain access via the A1 and limited possession windows available on the East Coast Mainline.

Environmental and Historical Constraints

3.26.7 Full consideration of potential environmental and historical constraints are provided in the accompanying report *Potential environmental and historical constraints*. A summary is provided below.

3.26.8 **Air Quality:** Recently, the air quality implications of road schemes have been highlighted, with speed limits being introduced where hard shoulder running has been introduced as part of a managed motorway scheme through Luton, and the M60 managed motorway scheme through Trafford being amended to remove hard shoulder running due to potential air quality issues resulting from increased traffic flows. Given that NO₂ levels already breach EU legal limits for much of the length of the A1 NGWB, this may constrain future development of the corridor. However, it is noted the M60 corridor in Manchester is an Air Quality Management Area (AQMA), whereas the Western Bypass is not; nor does the corridor pass through any designated area.

3.26.9 Three Air Quality Management Areas are located within 5km of the corridor, the closest being some 3km away.

3.26.10 **Cultural Heritage:** The route crosses Hadrian's Wall World Heritage Site immediately to the south of J75 Denton Burn, with the slip roads being within the site. The designated area of the World Heritage Site stretches approximately 100m either side of the alignment of the wall. Approximately 100 metres to the west of the A1 NGWB is Denton Hall Turret which also forms part of 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.

3.26.11 The Angel of the North sculpture lies 100 metres to the north east of the A1, to the north of the Eighton Lodge interchange, though it has no formal designation.

3.26.12 There a number of scheduled monuments in the area, three of which adjoin the route:

- Coal mining remains in Mallygill Wood, East of the A1M, approximately 1km north of the route commencement at J62 Carville;
- Site of Ravensworth Coal Mill, to the west of the A1, between J67 Coalhouse and J68 Lobley Hill; and
- Bowes Railway, which traverses the A1 NGWB immediately to the south of J66 Eighton Lodge interchange.

3.26.13 Other heritage assets shown on the 'Constraints' Plans within the report include conservation areas and listed buildings.

- 3.26.14 **Landscape:** The route passes through two separate Landscape Character Areas, urban and rural. Whilst there are no Special Landscape Areas within the route corridor, given the proximity of residential properties, townscape, rural landscapes, Green Belt and Public Rights of Way the potential exists for beneficial or adverse impacts upon all of these receptors.
- 3.26.15 **Biodiversity:** Given the extent of the route, it is likely that protected species such as Bats, Badgers and Great Crested Newts may be present in the area. Further detailed studies will be required to support the on-going assessments and design.
- 3.26.16 High level information obtained to date is detailed below:
- There are no National Nature Reserves along the route; however several Local Nature Reserves adjoin the highway boundary.
 - Shibdon Pond Site of Special Scientific Interest (SSSI) abuts the highway boundary to the west, between Swalwell and Derwenthaugh. There are other SSSIs located further from the corridor.
 - Two ancient woodlands border the site. Lumley Park Wood crosses the A1(M) to the south of Chester-le-Street interchange. An ancient woodland also lies to the East of the A1 near Coalhouse interchange.
- 3.26.17 **Noise:** As the route passes through residential areas and community facilities, there is the potential for schemes to adversely affect local people. Residential areas are located close to the road at Chester-le-Street, Birtley, and Lobley Hill through to Dunston.
- 3.26.18 North of the River Tyne, much of the route is flanked by residential development. The Denton Burn area is particularly vulnerable. A number of Noise Important Areas are identified in the *Potential environmental and historical constraints* report.
- 3.26.19 **Water:** In addition to the River Tyne floodplain, the route crosses three other locations with a 'High' risk of flooding. In addition it crosses the Rivers Team at Eighton Lodge (which passes through the centre of the interchange in a culvert), Derwenthaugh, south of Derwenthaugh Interchange, and Tees, north of Chester-le-Street.
- 3.26.20 Potential impacts and solutions for these, and other catchments, and early agreement of acceptable solutions with the Environment Agency (EA), may be a key element in relation to scheme programming.

3.27 Summary and Conclusions

- 3.27.1 The review of the current situation in the A1 NGWB has shown that:
- National, regional and local policies and strategies consider that the A1 NGWB, and improvements to the route, are fundamental to the economic performance of the region;
 - Travel demand data shows that more than 95% of journeys on the A1 NGWB are to, from or within the surrounding area, rather than long-distance trips, emphasising the importance of the route for local and regional journeys;
 - The design of the Gateshead Western Bypass between J65 Birtley and J83 Derwenthaugh is substandard with varying cross sections. It also has particularly

closely space intersections. The substandard design contributes to the operational challenges for the corridor in terms of resilience, safety and capacity.

- Traffic flows exceed the design capacity of the road, resulting in delays and unreliable journey times, particularly during the peak periods. The Gateshead western bypass in particular performs poorly against benchmarks in terms of safety.
- There are few performance issues to the south of J65 Birtley on the A1(M), and north of J79 Great Park on the A1.
- Public Transport currently plays a relatively minor role, and offers little alternative for the local orbital journeys that utilise the corridor. Local heavy rail use is insignificant compared to the flows on the A1NGWB, with a relatively poor local service.
- A key issue concerns the role of the corridor, the balance between its strategic and local roles, and whether the performance targets and expectations for the corridor are appropriate given the balance between these roles.
- A strong stakeholder consensus exists concerning the issues and challenges in the corridor, and the need for action.
- A number of environmental constraints exist in the corridor including the Hadrian's Wall World Heritage site, and other official safeguarding designations. Much of the corridor is immediately flanked the residential and commercial development.

4 Future Situation

4.1 Introduction

4.1.1 This section provides information on anticipated conditions in the corridor, and issues likely to arise, or be exacerbated. In doing so, it considers:

- Future land use policies;
- Future changes to transport systems; and
- Future travel demands and levels of service.

4.2 Future Land Use Policies

4.2.1 As a result of the ongoing engagement with the Local Authorities in the area, the Highways Agency has developed a thorough understanding of land use policies, and their potential impact on the traffic patterns in the corridor. The Newcastle-Gateshead Local Plan has been considered, as have plans for County Durham and Northumberland.

4.3 Gateshead/Newcastle

4.3.1 The final version of the joint Local Plan, "Planning for the Future Core Strategy and Urban Core Plan for Gateshead and Newcastle upon Tyne" was submitted to the Secretary of State for Communities and Local Government in February 2014. This sets out the vision for the level and distribution of development in the area through to 2030.

4.3.2 In Newcastle, the plan envisages some 21,000 new homes are to be provided during the plan period, with 11,000 in Gateshead. Employment sites are to be provided to support 8,000 new jobs in Gateshead, and 14,000 in Newcastle.

4.3.3 The A1 corridor is the focus of a number of major proposed development sites, both residential and employment. This is clearly shown in Figure 4-1 which is taken from the Local Plan submission. A number of these represent the intensification of existing sites or redevelopment of brownfield sites, while others are green field development.

4.3.4 Most of the "Neighbourhood Growth Area" housing sites are situated to the West of the A1, and will involve crossing and/or use of the A1 to reach the major facilities and employment opportunities located within the urban core.

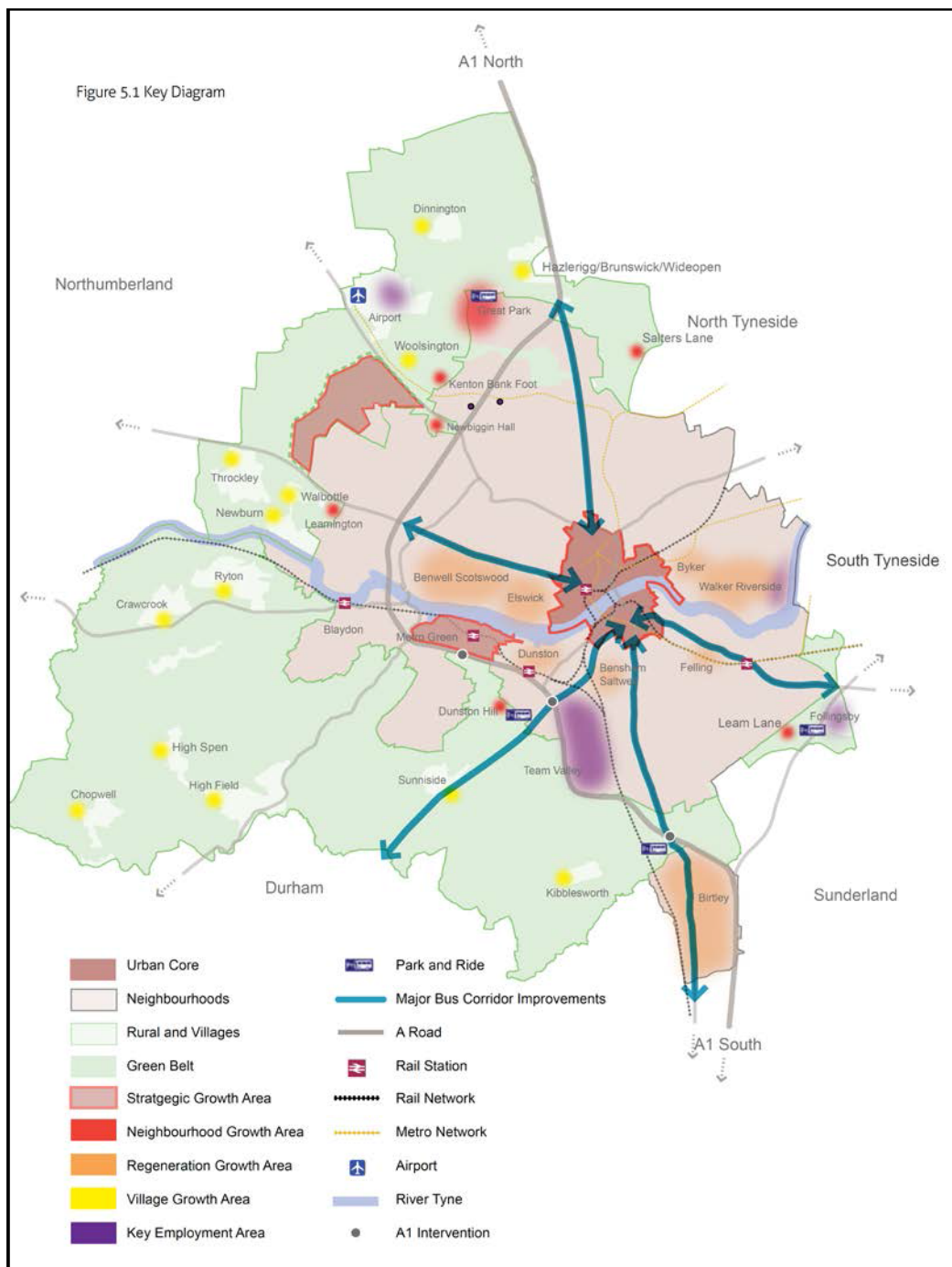


Figure 4-1: Newcastle Gateshead Local Plan Spatial Strategy

4.3.5 The key development sites in Newcastle that are likely to impact on the A1 are:

- Great Park (1,200 dwellings - green field);
- Callerton Park (4,100 dwellings - green field); and
- Newcastle Airport (50 hectares - Key Employment Area – green field).

4.3.6 Key development sites in Gateshead that will impact on the A1 are:

- Metrogreen (850 dwellings, 15,000m2 office, Mixed Use - brown field);

- Dunston Hill (520 dwellings - green field); and
- Team Valley (Key Employment Area - intensification/brown field).

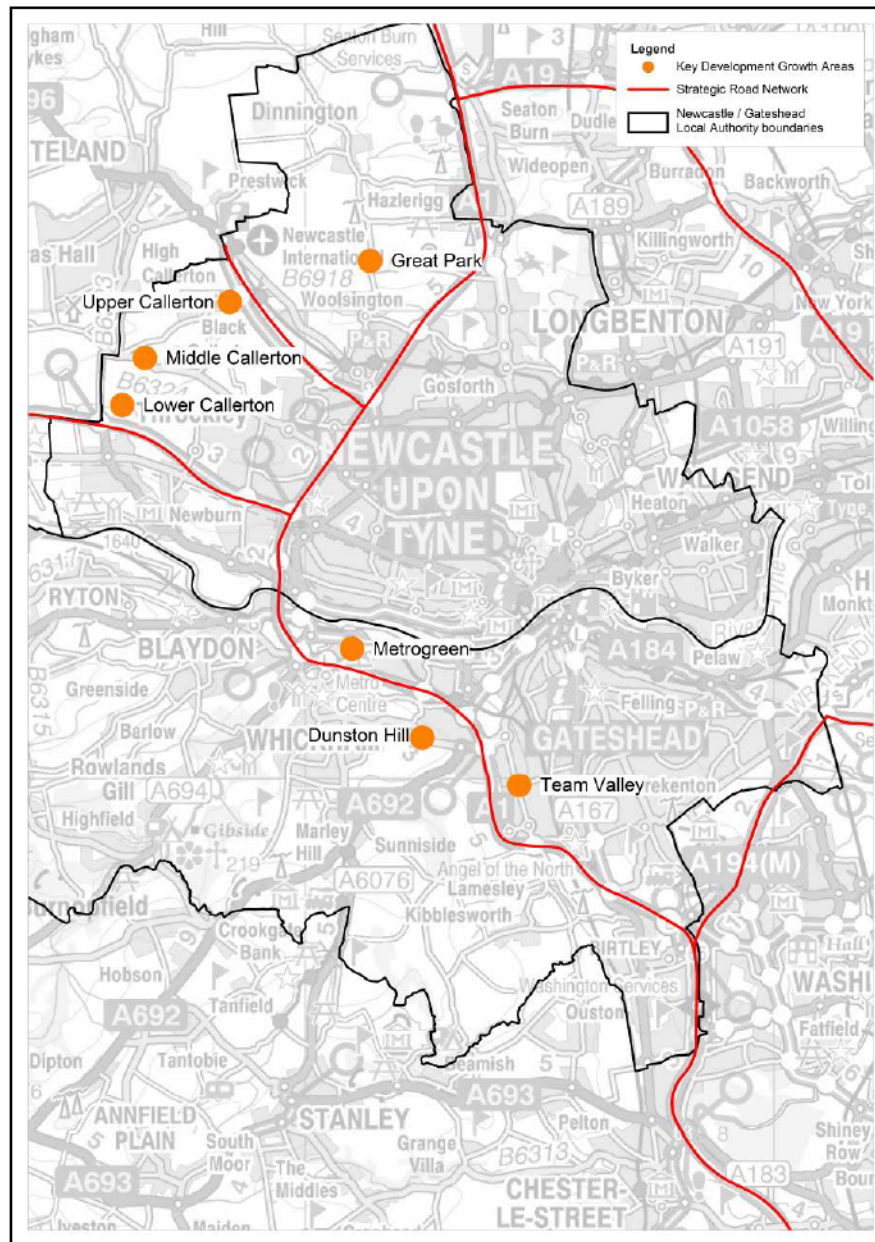


Figure 4-2: Key Development Areas

- 4.3.7 **Great Park:** much of the Great Park development has extant planning permission, though only a small part has been built out to date. The local plan envisages extending this area significantly, providing some 1,200 homes with capacity for future expansion beyond 2030. This is in addition to existing permissions.
- 4.3.8 There is a move to migrate the existing permissions from mixed use to a more residential focus. These sites are likely to generate significant additional commuter traffic on the

- Newcastle Western bypass in particular, in addition to that from the permitted, but not yet built out allocations.
- 4.3.9 **Callerton Park:** The Callerton allocations are for residential development in the current green belt, adjoining the current built up area. The sites, as shown in Figure 4.1, lie between the A696(T) and A69(T). They provide sites for some 3,000 homes, with the possibility of further allocations beyond 2030. Nearby allocations at Kingston Park and Newbiggin Hall, lying either side of the A696(T), provide for another 800 and 300 homes respectively.
- 4.3.10 **Newcastle Airport** is defined as a Key Employment Area, with some 50 acres of land earmarked in the vicinity for airport related and general employment uses. Connecting via the A696(T) to the A1 at Ponteland Road, the development here is expected to generate significant commuter flows on the A696(T), through the Ponteland Road Interchange and onto the A1.
- 4.3.11 **Metrogreen** will transform a brownfield site lying between the Metrocentre and the River Tyne into a new riverside community. It is planned to provide homes and new business space, with linkages to the leisure, retail and transport facilities at the Metrocentre making this a focal point for the new community. It will encompass 850 homes and 15,000m² of office space. A new crossing of the River Tyne passing through this development linking the Metrocentre to Scotswood Road is a potential key facilitator of this development.
- 4.3.12 The entire Metrocentre/Metrogreen area is enclosed by the A1, River Tyne and A184 Askew Road linking to the Tyne Bridge and A695 Dertwenthaugh Road linking to the Scotswood Bridge. The Metrocentre is already a large traffic generator. The Metrogreen development will increase traffic generation in the area, and is expected to have a significant impact on the A1, particularly if a new river crossing is not delivered.
- 4.3.13 **Dunston Hill** is a greenfield site adjacent to the current built up area. It is designated for some 520 homes. It is located to the west of the A1, and is likely to result in increased traffic in the Lobley Hill corridor, and making the 'dog-leg' movement on the A1 between Lobley Hill and Askew Road, as well as increasing pressure on the Lobley Hill and Dunston Road junctions.
- 4.3.14 **Team Valley** is designated as a key employment site. It is one of the largest trading estates in Europe, and hosts a mix of B1, B2 and B8 uses. It is the largest single employment site in Tyne and Wear, consisting of 6.5 million square feet of development, over 290 hectares. Currently, some 21,000 people are employed on the estate.
- 4.3.15 There are further opportunities for redevelopment of sections of the site, and a number of plots are currently vacant. Uses proposed would see an intensification of employment on the site, continuing a trend that has seen spatially extensive heavy industrial uses change to more intensive uses such as office and retail. Commuting flows associated with Team Valley already place severe strain on the A1 NGWB and the junctions at Coalhouse and Lobley Hill, this pressure would be further intensified with the intensification and redevelopment.
- 4.3.16 A further supplementary Local Development Document is to be developed for Team Valley to accompany the Local Plan.
- 4.3.17 A number of the **Neighbourhood Opportunity Areas** also fall within the sphere of influence of the A1 NGWB corridor. The impact of these in terms of additional trip generation is unclear, insofar as they involve replacement or refurbishment of the existing housing stock, or provision of additional housing over and above that which currently

exists.

4.4 County Durham

4.4.1 The Durham Local Plan is at Pre-Submission Draft stage. The areas of Chester-le-Street and North Durham City have strong commuting links with the south of Gateshead and the Urban Core. Housing development in the north of Durham is predicted to generate traffic on the A1(M) and A1 Gateshead bypass in particular.

4.4.2 The construction of the Durham Northern Relief Road will help to facilitate this development. This will run from the A690, immediately to the west of J62 Carrville. It will provide an alternative route from the A1(M) corridor to the north and west of the city centre, and ready access to the A1(M) from the new development areas at North of Amison (1,000 houses) and Sniperley (2,200 houses), as shown in **Error! Reference source not found.** Sherburn Road housing area, while immediately adjacent to, does not have direct access to the A1 with access to the A1(M) also being via J62 Carrville.

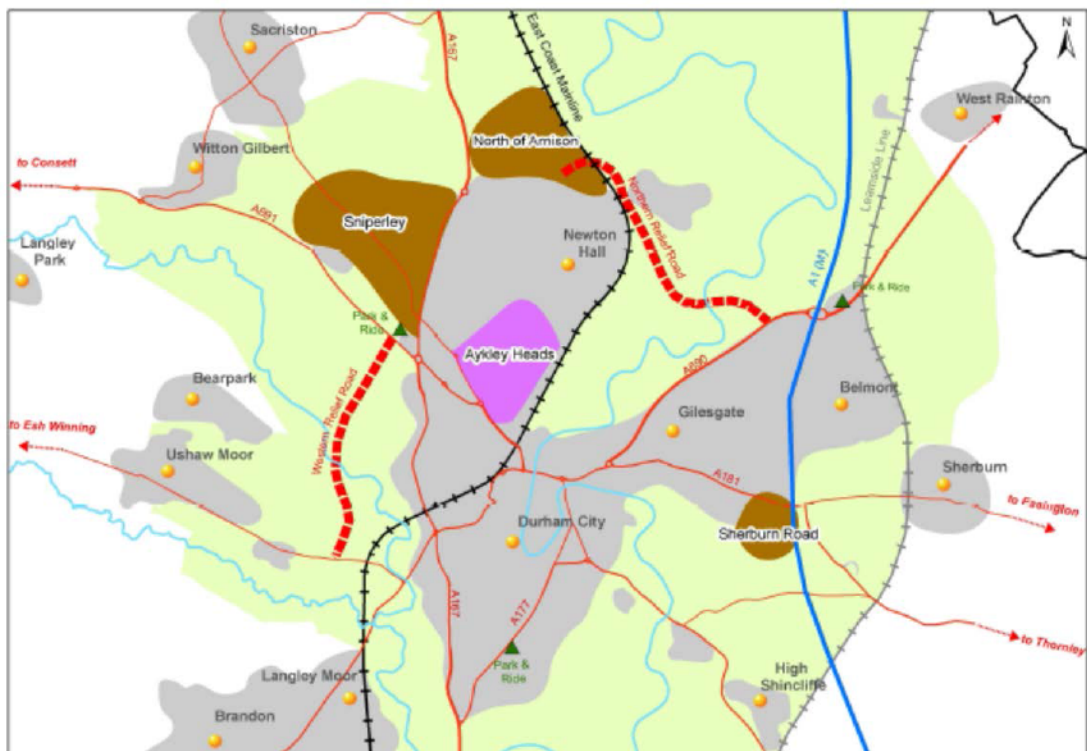


Figure 4-3 Development allocations at Durham City and Durham North and Western Relief Roads (Source: Durham Pre-Submission Draft Local Plan, October 2013)

4.4.3 Aykley Heads is designated as a strategic employment site due to its “excellent road links to the A1(M)”, and has the potential to accommodate 6,000 jobs.

4.5 Northumberland

4.5.1 The Northumberland Local Plan is at Core Strategy Preferred Options Consultation Stage 2, with this document being published in October 2013. The development area at Cramlington near to Seaton Burn is of particular importance with regard to potential impacts on the A1 NGWB, with linkages to Morpeth to the north also being significant.

- 4.5.2 Cramlington is described as being a prime site for inward investment because of the quality of its environment, “and a strategic location for economic development building on its excellent transport links, and ready access to the Tyneside market and labour pool”. Some 13 hectares are reserved for a large inward investment, and 19 hectares for general employment use. Some 3,480 houses are scheduled for delivery over the plan period. As shown in Figure 4-4, the allocated site is the south west of the town, close to the Seaton Burn interchange.
- 4.5.3 The development will increase pressure on the Fisher Lane/Seaton Burn complex, and was considered as a factor in the development of the Seaton Burn Pinch Point scheme. This study found that additional measures would be needed in future to support full build out of the housing and employment allocations at Cramlington.

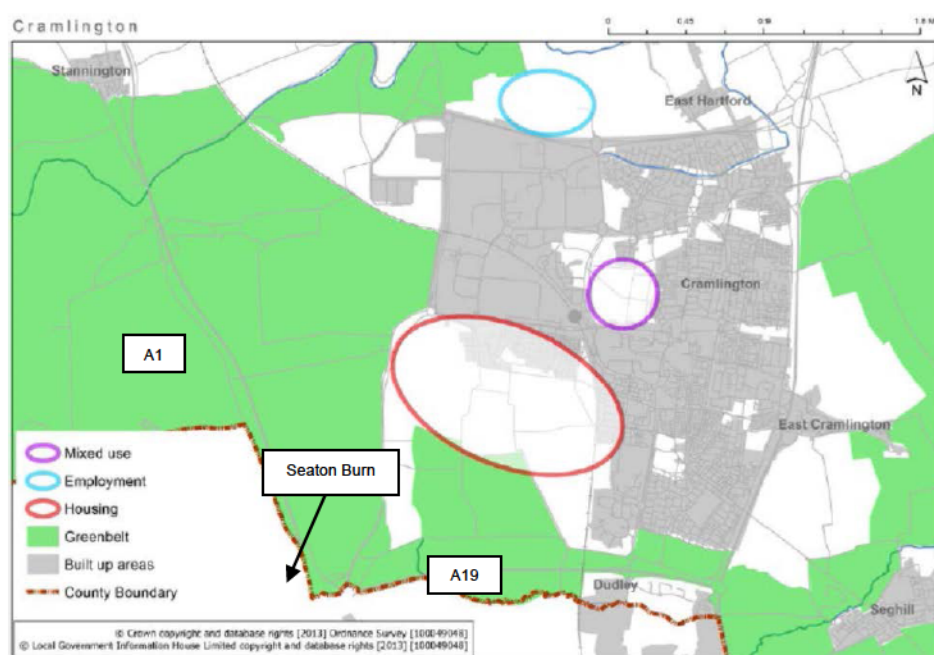


Figure 4-4 Development allocations at Cramlington
(source: Northumberland Local Plan, Consultation Document: October 2013)

- 4.5.4 Morpeth’s linkage with the A1 will be further improved with the construction of the A1 – South East Northumberland Link Road. Sites are identified for the construction of some 1,500 houses over the plan period, with the Morpeth Northern Bypass section of the Link Road being a key facilitator of this development. 18 hectares of land are allocated for employment use, with the A1 Link Road providing access.

4.6 Future Changes to the Transport System

- 4.6.1 A number of changes to the transport system are either committed or aspired to over the coming years. These are included in various documents, including the Local Transport Plan, the Local Plan, and the draft LEP Transport Strategy.

4.7 Committed Future Highway Schemes

- 4.7.1 There are two schemes which are committed and will shortly commence construction on the A1 itself in the study area. These are the Loblely Hill to Dunston Improvement Scheme (incorporating extensions to Coalhouse and Metrocentre) and the Seaton Burn Pinch

Point scheme.

- 4.7.2 The approval of the Lobley Hill to Dunston Improvement Scheme major scheme was announced in the Autumn Statement in 2013. This scheme sees the introduction of collector-distributor roads between the A692 Lobley Hill Road interchange and the A184 Askew Road interchange in both directions. This will mean that traffic making the 'dog-leg' movement between Lobley Hill Road and Askew Road will be separated from through traffic on the A1.
- 4.7.3 An extension to the scheme was approved in early 2014, meaning that the scheme will provide dual three lanes to the A1 between Metrocentre and Coalhouse interchanges. No enhancements are proposed to the interfaces with the LRN at any of the interchanges along the route, the capacity of which to handle increased levels of traffic flow facilitated by the scheme, and generated by development and background growth is of some concern going forward.
- 4.7.4 The Seaton Burn Scheme will see an enhancement of the northbound off slip at Seaton Burn, and amendments to the adjacent roundabout at Fisher Lane. This will prevent traffic queuing back onto the A1 northbound and interfering with through traffic.
- 4.7.5 To the south of the study area, the upgrade of the A1 to A1(M) dual three-lane motorway between Dishforth and Leeming Bar will have increased the attractiveness of the corridor to strategic trips. This will be further enhanced with the recent approval of the upgrade of the 'missing link' between Leeming Bar and Barton. This will connect Tyne and Wear to the National Motorway Network and provide continuous motorway between Tyne and Wear and London. This will further increase the attractiveness of the study corridor for strategic trips, with the motorway terminating at J65 Birtley.
- 4.7.6 The ongoing introduction of junction numbers on the Western Bypass between J65 Birtley and J80 Seaton Burn, continuing the numbering series from the A1(M) will also further reinforce the impression of the A1 NGWB as a key strategic road. Only a handful of other key dual carriageway all-purpose roads which form part of the SRN have their junctions numbered in this way, such as the A14(T) and A42(T).
- 4.7.7 On the LRN there is a scheme to improve access for buses through the Maingate Roundabout, which lies to the North of Team Valley Trading Estate, on Lobley Hill Road. Its proximity to the A692 Lobley Hill Interchange makes this a key scheme with regard to the operation of the A692 Lobley Hill Roundabout, and hence the SRN.

4.8 Aspirational Highways Schemes

- 4.8.1 Among the key aspirational highways schemes on the LRN are a new link road between the A1 at Seaton Burn and the A69 at Throckley. A key facilitator of the proposed development of the 5,300 homes in the north west quadrant encompassing the Callerton Park and Great Park areas is a proposed new dual carriageway link road running between the A1(T) at North Brunton, and the A69(T) at Throckley, connecting with the A696(T) in the vicinity of Newcastle Airport. This is shown in Figure 4.1 as an 'indicative access road'. Envisaged as being at-grade with signal controlled intersections, this road has the potential to change travel patterns in the area, and will greatly enhance access between the developments and the SRN.
- 4.8.2 A long term aspiration has been the provision of additional river crossing capacity within the urban area. As mentioned above, a corridor has been reserved for provision of a road bridge crossing the River Tyne as part of the Metrogreen development. This will link the

Metrocentre in Gateshead with Scotswood Road in Newcastle. This has the potential to alter traffic patterns crossing the River Tyne and in the surrounding area, including on the A1.

- 4.8.3 There are a number of potential pinch-point schemes that have been studied on the A1 corridor. These include the signalisation of Coalhouse Roundabout and alterations to the merge arrangements and northbound link between Birtley and Eighton Lodge interchanges.
- 4.8.4 The key aspiration of local stakeholders, including the LEP and local authorities, is the delivery of additional capacity throughout the A1 NGWB corridor, and as the Draft North Eastern LEP Transport Strategy states, this may involve physical widening of the A1. This is further reinforced in the SEP, with the stated aspiration for a dual three lane A1 NGWB with the exception of the River Tyne crossing.

4.9 Public Transport

- 4.9.1 A number of public transport schemes are proposed in the Local Transport Plan and the Local Plan which could impact on both rail and bus demand in the corridor.
- 4.9.2 In terms of heavy rail, and as mentioned previously, the North East LEP commissioned a new study to produce a business case for the reopening of the Leamside Line in April 2014. Network Rail have cited the Leamside Line as a potential freight route to increase capacity in the area to provide improved and more resilient passenger services, on the East Coast Mainline, but that this would be considered post 2019.
- 4.9.3 Nexus published its Metro Strategy 2030 consultation document in March 2014. This included the possibility of Metro services on part of the Leamside Line. It also included the suggestion of Metro being extended to serve the Metrocentre and Team Valley (Figure 4-5).

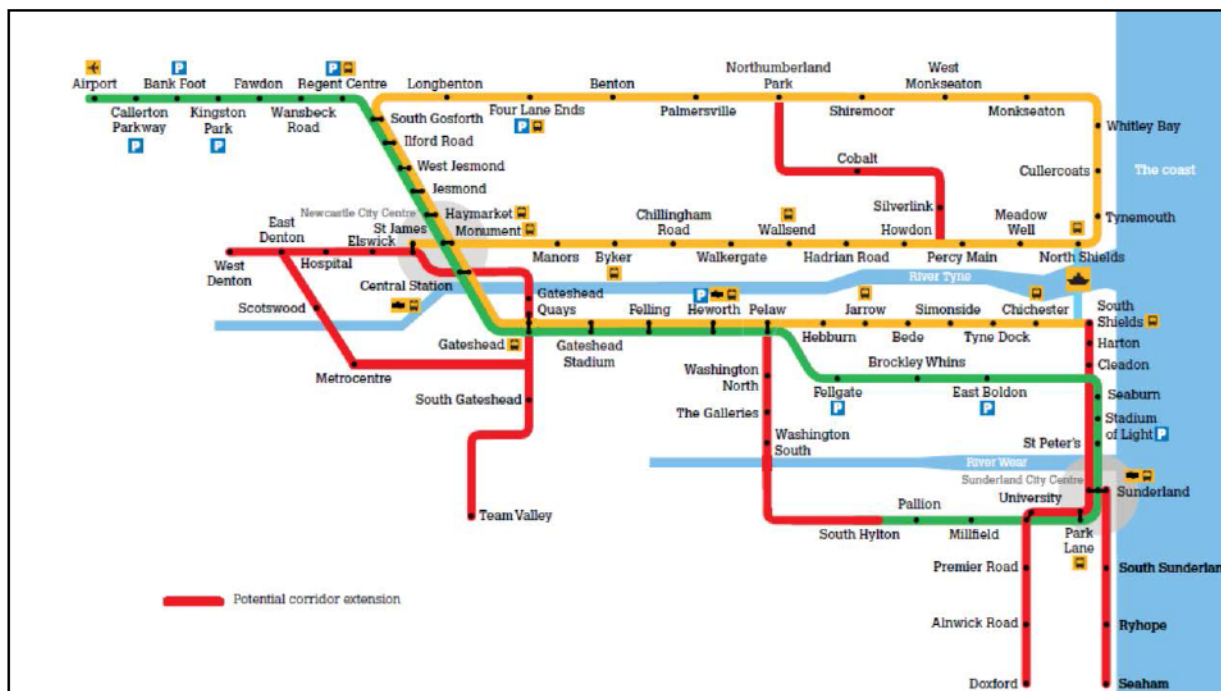


Figure 4-5: Potential Metro Extension to 2030 (Source: Metro Strategy 2030)

4.9.4 In terms of buses, corridor improvements are proposed for four corridors which may potentially impact on the A1 NGWB corridor, as they either parallel or cross the route. These are:

- A692 Corridor (through Lobley Hill interchange and Team Valley North to Urban Core);
- Durham Road (original A1 from Birtley through to the Urban Core);
- West Road (Denton Burn to the Urban Core); and
- Great North Road (original A1 from North Brunton to the Urban Core).

4.9.5 These corridors are shown in Figure 4-1 from the Local Plan. Some parts of these schemes (For example the A692 approach to Lobley Hill Roundabout) have been recently implemented, while others, such as Maingate Roundabout are underway. Others are programmed or currently aspirational.

4.9.6 The bus infrastructure schemes have the potential to encourage modal shift, however depending on the nature and design of the schemes, they may reduce capacity on the LRN. If the reduction in capacity for cars is not met by a commensurate modal shift, traffic may be displaced to the SRN. Likewise, reductions in LRN capacity for general traffic at key points, such as the Maingate Roundabout, in favour of buses may directly impact on the SRN due to blocking back.

4.9.7 There are planned park-and-ride sites identified in the Local Plan, associated with these enhanced bus corridors (Figure 4-1). Those relevant to the A1 NGWB are located at Eighton Lodge. While the A692 would intercept traffic before it reaches the A1 NGWB, traffic wishing to reach the Eighton Lodge site would have to negotiate the current congestion at Birtley, though it will provide an intercept for traffic approaching the A1 NGWB on the A167 Durham Road from the south.

- 4.9.8 The LSTF bid for Newcastle and Gateshead sought funding for a bus service between Washington, Team Valley and Metrocentre, paralleling the A1 Gateshead bypass. Funding for this scheme was not awarded by the DfT. The lack of commercial service on this corridor suggests that either there is little potential for mode shift to bus, or the commercial operators have chosen not to take a risk to grow the market for public transport.

4.10 Future Travel Demands and Levels of Service

- 4.10.1 It has been noted that development plans for the Newcastle-Gateshead area see 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 bypass is critical to the overall 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 the mainline.
- 4.10.2 Much work has been undertaken to date to understand the implications for the future operation of the corridor. This commenced with the Newcastle and Gateshead Infrastructure studies and continued with the A1 West of Newcastle Route Based Strategy. It is continuing to date with an investigation that has been undertaken into the extent to which the LEP aspiration of a dual three-lane route, (with the exception of Blaydon Bridge,) would meet the additional traffic demand that is predicted to be generated by the combination of development and background growth.
- 4.10.3 This work has indicated that, in the absence of additional measures over and above the committed schemes, the level of service offered by the corridor will decline further. Rather than being the key distributional artery for the area, congestion will increase, and the operational metrics, which already illustrate that levels of service are significantly lower than benchmark, will decline further.
- 4.10.4 The work has been undertaken using the Tyne and Wear Meso model, and subsequently the extended version, the North East Strategic Mesoscopic Model (NESMM). Traffic from new developments has been generated using generic trip rates, and distributed using the PENELOPE tool. The resultant flows have been cordoned to the Meso extents and assigned to the network.
- 4.10.5 Background trips have been factored, such that the background growth, when combined with development trips is constrained overall to TEMPRO growth. This process has the effect of reflecting the distribution of development proposals, while maintaining a cap on overall growth.
- 4.10.6 Tests have been run for the Base Year, 2015, 2020. The scenarios considered so far assumed that a three lane A1 NGWB is in place in 2020. A test with the 2020 demand and 2015 network (as present, with the Lobley Hill and Seaton Burn improvement schemes in place) is pending. The results are shown in Table 5.1 for the A1 Southbound, and Table 5.2 for the A1 Northbound.
- 4.10.7 The metric reported is Delay Ratio, which is the ratio of Actual Link Travel Time to Free Flow Link Travel Time. This is reported for mainline links (shaded blue), slip roads and LRN approaches and departures. It is intended as an indicator of predicted conditions. Note that the top green band of 1.0 - 1.2 indicates a journey time between free flow time, and one 20% in excess of the free flow journey time. The black band of >5 indicates a journey time more than five times greater than that experienced during free flow times.

- 4.10.8 The analysis shows the impact of the Lobley Hill scheme in the PM, with the slow moving sections on the Southbound approach to Lobley Hill eradicated in 2015 when the scheme is in place. Issues are seen to remain, and indeed worsen elsewhere.
- 4.10.9 The 2020 test, which includes three dual lanes throughout shows a marked improvement for the A1 mainline, showing that the additional capacity has coped with growth and solved many of the issues apparent in the base and 2015 test. However there are numerous other issues pertaining to capacity at junctions, with delays and queues on the local road network in particular. Lobley Hill in particular is affected, with queuing back occurring from Maingate Roundabout at the north of the Team Valley Trading Estate back onto the A1.
- 4.10.10 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 AM peak period, and Lobley Hill and Coalhouse in the PM peak period. To the north of the river, conditions in the section between Scotswood and Ponteland Road will also deteriorate.
- 4.10.11 This information has been used to inform the node link analysis in Appendix A, and identify the challenges in the following section.
- 4.10.12 The review of the future situation in the A1 NGWB corridor has shown that:
- There are significant development plans in Durham, Gateshead, Newcastle and Northumberland which will have an impact on travel demand on the A1 NGWB;
 - Developments at Cramlington in Northumberland and in County Durham, particularly in the North of the City of Durham, are likely to load additional traffic at either end of the A1 NGWB corridor;
 - There are committed highway schemes, principally the Lobley Hill to Dunston Improvement Scheme and the Seaton Burn Pinch Point Scheme, which will address some of the current and future problems on the A1 NGWB;
 - Without intervention, conditions on other parts of the A1 NGWB will deteriorate, particularly south of Coalhouse to Birtley and between Scotswood and Ponteland Road to the north of the river;
 - Bus priority schemes on the LRN may displace traffic to the SRN, unless the modal shift achieved is commensurate with the loss of general traffic capacity;
 - Consideration is being given to potential major public transport improvements, such as extensions to the Metro system and reopening of the Leamside Line, which could potentially have an impact on travel demand on the A1 NGWB; but
 - In general, committed plans for changes to the transport network are not commensurate with the increase in demand expected due to development and background growth.

Table 4.1 Meso Model Results from 2014 A1A1 NGWB Infrastructure study – Delay Ratio on Links - Southbound

Table 4.2 Meso Model Results from 2014 A1A1 NGWB Infrastructure study – Delay Ratio on Links - Northbound

| A1 Northbound | | South of River Tyne | |
|---------------------|--|----------------------------------|--|
| AM | | A1(M) Blind Lane - Washington | |
| Base | | A1(M) Washington off slip | |
| 2015 Committed | | A1(M) Washington through | |
| 2020 Alternative | | A195 Western Highway out | |
| | | A195 Western Highway in | |
| | | A1(M) Washington on slip | |
| | | A1(M) Washington - Birtley | |
| | | A194(M) out | |
| | | A1 Birtley through | |
| | | A1231 In | |
| | | A1 Birtley on slip | |
| | | A1 Birtley - Eighton Lodge | |
| | | A1 Eighton Lodge off slip | |
| | | A1 Eighton Lodge through | |
| | | A167 Durham Road out | |
| | | A167 Durham Road in | |
| | | A1 Eighton Lodge on slip | |
| | | A1 Eighton Lodge - Coalhouse | |
| | | A1 Coalhouse off slip | |
| | | A1 Coalhouse through | |
| | | Lamesley Lane out | |
| | | Lamesley Lane in | |
| | | A1 Coalhouse on slip | |
| | | A1 Coalhouse - Lobley Hill | |
| | | A1 Lobley Hill off slip | |
| | | A1 Lobley Hill through | |
| | | A692 Lobley Hill Road out | |
| | | A692 Lobley Hill Road in | |
| | | A1 Lobley Hill on slip | |
| | | A1 Lobley Hill - Askew Road | |
| | | A1 Askew Road off slip | |
| | | A1 Askew Road through | |
| | | A1 Askew Road on slip | |
| | | A1 Askew Road - Dunston Road | |
| | | A1 Dunston Road Off | |
| | | A1 Dunston Road Through | |
| | | Dunston Road Out | |
| | | Dunston Road In | |
| | | A1 Dunston Road on slip | |
| | | A1 Dunston Road - Metrocentre | |
| | | A1 Metro Centre off slip | |
| | | Hollinside Road Out | |
| | | Hollinside Road In | |
| | | A1 Metrocentre on slip | |
| | | A1 Metro Centre - Swalwell | |
| | | A1 Swalwell off slip | |
| | | A1 Swalwell - Derwentaugh | |
| | | A1 Derwentaugh off slip | |
| | | A1 Derwentaugh through | |
| | | A1 Derwentaugh on slip | |
| | | A1 Derwentaugh - Blaydon Bridge | |
| PM | | | |
| Base | | | |
| 2015 Committed | | | |
| 2020 Alternative | | | |
| North of River Tyne | | | |
| AM | | Blaydon Bridge - Scotswood Slips | |
| Base | | A1 Scotswood Slips on | |
| 2015 Committed | | A1 Scotswood Slips - Denton Burn | |
| 2020 Alternative | | A1 Denton Burn off slip | |
| | | A1 Denton Burn through | |
| | | A69 out | |
| | | A69 in | |
| | | A1 Denton Burn on slip | |
| | | A1 Denton Burn Stamfordham Rd | |
| | | A1 Stamfordham Road off slip | |
| | | A1 Stamfordham Rd through | |
| | | Stamfordham Rd out | |
| | | Stamfordham Rd in | |
| | | A1 Stamfordham Rd on slip | |
| | | A1 Stamfordham Rd - Ponteland Rd | |
| | | A1 Pontland Road off slip | |
| | | A1 Pontland Road through | |
| | | A696 out | |
| | | A696 in | |
| | | Pontland Road out | |
| | | Pontland Road in | |
| | | A1 Pontland Road on slip | |
| | | A1 Pontland Road - Kingston Park | |
| | | A1 Kingston Park off slip | |
| | | A1 Kingston Park through | |
| | | Kingston Park Road out | |
| | | Kingston Park Road in | |
| | | A1 Kingston Park on slip | |
| | | A1 Kingston Park - North Brunton | |
| | | A1 North Brunton off slip | |
| | | A1 North Brunton through | |
| | | Great Park Way out | |
| | | Great Park Way in | |
| | | A1 North Brunton on slip | |
| | | A1 North Brunton - Seaton Burn | |
| | | A1 Seaton Burn off slip | |
| | | A1 Seaton Burn through | |
| | | A1 Seaton Burn on slip | |
| | | A1 North of Seaton Burn | |
| PM | | | |
| Base | | | |
| 2015 Committed | | | |
| 2020 Alternative | | | |

Key - Delay Ratio

Actual Link Travel Time
Free-Flow Link Travel Time

| | |
|--|-----------|
| | 1.0 - 1.2 |
| | 1.2 - 1.4 |
| | 1.4 - 1.6 |
| | 1.6 - 2.0 |
| | 2.0 - 3.0 |
| | 3.0 - 4.0 |
| | 4.0 - 5.0 |
| | > 5.0 |

5 Need for Intervention

5.1 Introduction

5.1.1 This section summaries the evidence presented in Chapters 3 and 4, drawing out:

- Current transport-related problems;
- Future transport-related problems; and
- The need for intervention.

5.2 Current transport related problems

5.2.1 The evidence presented in Chapters 3 and 4 presents a compelling case for intervention on the A1 NGWB corridor. The current performance of the corridor is poor, preventing development and employment opportunities coming forward in the area.

5.2.2 The major focus of National Policy is on the promotion of economic growth, however local stakeholders identify the levels of service offered by the A1 NGWB as a major impediment to development and economic growth within Tyne and Wear. Intervention on the corridor is seen as a key priority by the North East LEP, by local authorities and by business groups, in order to unlock the potential of the area and facilitate development.

5.2.3 The highway design and configuration is problematic. Design standards on the Gateshead section are variable, with closely spaced interchanges being an issue. There are 15 junctions in the 21km between Birtley and North Brunton inclusive. This results in weaving issues and driver stress, reduces through capacity and gives rise to a significant number of collisions on key links, though casualty levels on those links where most traffic collisions occur are relatively low, perhaps due to low speeds.

5.2.4 A key aspect of the A1 NGWB is the multifaceted role it plays, in part due to the number of junctions, indeed many of the links play multiple roles in the overall road structure of the area. Between Birtley and Seaton Burn it forms the following roles:

- Strategic (whole length);
- Radial-Arterial (e.g. from South via Askew Road into the Urban Core);
- Local 'Rat-Run'(e.g. Swalwell to Metrocentre);
- Suburban-Distributor (e.g. Denton Burn – Kingston Park and intermediate junctions); and
- Ring Road.

5.2.5 Traffic demand in the corridor currently exceeds the capacity of the infrastructure, with flow breakdown and long delays a daily occurrence at peak times. The indicators consistently highlight the same key links as providing a poor level of service, as well as the same pinch points. These issues are reaffirmed by stakeholders and traffic modelling.

5.2.6 The operational issues pertaining to each link are shown in Appendix A, along with information on the lane configuration. This provides a summary of the information

- provided in the previous chapters on the current situation. Pertinent issues are highlighted for links and junctions where these are poorly performing on a particular criterion, and these are rated on a red-amber-yellow 'RAY' scale. Only where the link performs particularly poorly on a given criterion are they reported in this table. The link or junction segment is then given an overall red-amber-yellow-green 'RAYG' rating, based on the poorest performing criterion section.
- 5.2.7 This shows clearly that the most problematic section in operational terms is the Gateshead bypass, particularly the southbound carriageway. The section of the Newcastle Western Bypass between North Brunton and Scotswood is also problematic. The section across Blaydon Bridge, North of North Brunton, and the A1(M) is relatively problem free at present.
- 5.2.8 The most problematic section of the Gateshead Western Bypass is that covered by the Lobley Hill to Dunston Improvement Scheme. Following implementation of this scheme, the sections between Birtley and Coalhouse, and between Swalwell and Derwenthaugh appear to be most in need of intervention. Should this be a capacity enhancement intervention, then the bridges at Derwenthaugh and Allerdene would represent constraints.
- 5.2.9 A key problem in the corridor is air quality, with NO₂ levels along much of the corridor in excess of legal limits set by the European Union. Increasing capacity, and hence traffic levels, on the A1 NGWB, is likely to further exacerbate this problem. This issue has come to increased prominence recently with Hard Shoulder running being removed from the plans for the M60 Smart Motorway scheme because of the predicted impact in a corridor where NO₂ levels already breach European limits by 50%. The proximity of existing residential development to the highway boundary makes this a particular area of concern for the A1 NGWB corridor. It is noted however that there is no AQMA designated at any point along the corridor.
- 5.2.10 The safety record of the corridor as a whole is poor, with most of the route being above benchmark in terms of KSI statistics. The Gateshead bypass section in particular performs poorly on these metrics. Minor shunt type collisions are particularly associated with flow breakdown in the congested areas. Incidents in the corridor cause great disruption given the difficulty of recovery and emergency service access.
- 5.2.11 There are a significant number of pedestrian incidents for a road with no pedestrian footways. It is unclear whether these are associated with attempts to cross the road or perhaps associated with vehicle breakdowns. There are no at grade facilities for pedestrians to cross the A1 mainline itself. Pedestrian bridges are provided, as are crossings at interchanges, but facilities at junctions vary in quality. As such, the A1 NGWB causes severance issues for pedestrians.
- 5.2.12 Being an all-purpose dual carriageway, cyclists are permitted on the A1 NGWB, however given the nature and business of the road, few, if any actually use it. The prohibition on slow moving vehicles at peak times prohibits use by cyclists at these times. Traversing the corridor at a number of the junctions is difficult for cyclists. This is particularly the case at the busy roundabouts. Therefore, as is the case for pedestrians, the A1 NGWB represents a barrier to movement for cyclists.
- 5.2.13 Public transport alternatives are limited for many of the movements facilitated by the corridor. Bus services to cater for key movements which use the A1 NGWB, such as Washington – Team Valley – Metrocentre have been proposed, and funding applied for through the LSTF. In the current institutional environment however, revenue subsidy is

unlikely to be available in the long term, and without pump-priming funding (that part of the bid was unsuccessful), potential commercial viability cannot be proven.

- 5.2.14 The extent to which the problems of the A1 NGWB are an issue for strategic traffic is somewhat debateable. Certainly there is very little through traffic on the A1 between Birtley and Eighton Lodge, and vice versa. Most traffic is either local or has an origin or destination in the area.

5.3 Future transport-related problems

- 5.3.1 Without intervention, the transport-related problems cited above will worsen. Economic development and growth, already affected by the current performance of the corridor, will be further constrained from its potential trajectory due to congestion on the A1 NGWB.

- 5.3.2 Whilst the Lobley Hill to Dunston Improvement Scheme will deal with one of the most problematic pinch points on the network, other issues will remain and worsen. Analysis suggests that congestion will occur at the ends of the new dual three-lane section at Coalhouse and at Swalwell. Issues north of the river are not addressed or resolved by the Lobley Hill scheme.

- 5.3.3 The concentration of development sites adjacent to, and with direct connection to the corridor will increase traffic demand into the future. Access to many of the new jobs and houses to be created in Newcastle and Gateshead will lead to additional trips on or, at least, crossing (and hence interacting with), the corridor. Development planned in County Durham and Northumberland will add to this demand.

- 5.3.4 The impact of these developments, combined with background growth, has been modelled and shared with stakeholders through the infrastructure studies. Based on current infrastructure, plus the committed schemes, the demand exerted on the network will lead to widespread congestion and delay. Whether this would actually occur is open to argument - it is likely that without intervention, many of the proposed housing and employment developments may not be able to come forward.

- 5.3.5 Additional transport links, such as an additional Tyne crossing and A69(T) – A696(T) – A1(T) link road are envisaged as key components in facilitating the delivery of development. They could potentially provide relief to some sections of the SRN, and replace some movements. It is noted, however that they also serve to ease access to the A1 corridor, and once traffic reaches the A1 corridor it has to go somewhere; either traversing or joining the A1 NGWB.

- 5.3.6 Rail is unlikely to be a major contributor in achieving modal shift to relieve demand on the A1 NGWB without major intervention with respect to services, stations and/or line reopening. Even then, the shift that could potentially occur would not provide enough capacity to keep pace with the predicted overall demand for travel.

- 5.3.7 The proposed key bus priority corridors will need to encourage enough modal shift to bus to cater for the reduction in capacity for general traffic on the LRN. If this is not the case, then traffic demand on the A1 NGWB could increase as a result of the implementation of these schemes. This is a particular concern where the corridors are on parallel routes, i.e. the old A1 corridor (Durham Road to the south, and Great North Road to the North of the urban core).

- 5.3.8 The strategic role of the A1 NGWB, in terms of catering for through traffic, may increase in future. There are a number of factors which may have a role in this. These include the

completion of the 'missing link' motorway between Leeming Bar and Barton, the potential scheme to upgrade the A1 north of Newcastle, and even the continuation of junction numbering from the motorway along the western bypass. Conditions on the bypass then become an increasing concern in the context of providing for strategic national movements.

5.3.9 Table 5-1 details the challenges and issues pertaining to the route arising from the analysis presented, and summarises the need for intervention.

| ID | Location | Type | Challenge | Source |
|----|------------------------|--|--|---|
| 1 | Whole Route | Network Operation | Journey Time Reliability | A1 West of Newcastle Bypass RBS |
| 2 | Whole Route | Asset Condition | Current Pavement condition is below national average. | A1 West of Newcastle Bypass RBS |
| 3 | J66 - J68 J66 - J62 | Asset Condition | Geotechnical problem areas around the Team Valley - several new defects found in this section following heavy rainfall in 2012. Following this, full detailed inspection of the A1 NGWB was recommended. | A1 West of Newcastle Bypass RBS |
| 4 | J66 - J67 J67 - J66 | Asset Condition | Allerdene Bridge is a concern for long term serviceability. | A1 West of Newcastle Bypass RBS |
| 5 | Whole Route | Network Operation | Only six MS4 variable message signs in the study area. | A1 West of Newcastle Bypass RBS |
| 6 | J65 - J80 J80 - J65 | Network Resilience | Incident Recovery difficult due to traffic levels and lack of hard shoulder. | A1 West of Newcastle Bypass RBS |
| 7 | Whole Route | Environmental; Social; Other Modes | Limited crossing facilities for pedestrians and cyclists; those at junctions are variable in quality. A1 NGWB represents a major barrier to pedestrian and cyclist movement. | Site observations over numerous studies |
| 8 | Whole Route | Environmental; Social | Residential development both close, and immediately adjacent, to the corridor including sensitive noise receptors. | |
| 9 | J65 - J79 J79 - J65 | Safety; Network Operation | Closely spaced junctions result in issues associated with weaving and blocking back. Also results in heavy use for local and very short distance trips. All local roads between J65 and J73, and between J74 and J79 intersect with the A1 at grade separated junctions. | A1 West of Newcastle Bypass RBS; TAMMS. |
| 10 | J65 - J79 J79- J65 | Network Operation | Conflict in role between strategic and local traffic. | A1 West of Newcastle Bypass RBS |
| 11 | Whole Route | Network Operation | Potential increase in strategic traffic due to completion of London - Newcastle Motorway, with A1(M) Leeming Bar to Barton. | A1 West of Newcastle Bypass RBS |
| 12 | Whole Route | Other Modes | Parallel East Coast Mainline at capacity; rail services flighted to maximise paths; poor services for local journeys. | |
| 13 | Whole Route | Other Modes | Relatively poor bus service alternatives in context of trips using the A1 NGWB. | A1 West of Newcastle Bypass RBS |

| ID | Location | Type | Challenge | Source |
|----|-------------|-------------------------------------|--|--|
| 14 | Whole Route | Other Modes | Allerdene Bridge is a concern for long term serviceability. | A1 West of Newcastle Bypass RBS |
| 15 | Whole Route | Other Modes | Planned Bus Priority Schemes on LRN parallel and traversing routes will reduce capacity for general traffic and may increase demand on the SRN. | A1 West of Newcastle Bypass RBS |
| 16 | J80 | Network Operation; Key Developments | Peak Queuing at Fisher Lane Roundabout extends back to NB mainline in PM peak. Queuing on other approaches to Roundabout. Issues will be mitigated by Seaton Burn Pinch Point Scheme, but then exacerbated by Cramlington development. | A1 West of Newcastle Bypass RBS; Northumberland Local Plan Seaton Burn PPP Business Case; A1 Adonis Infrastructure Study |
| 17 | J80 - J79 | Network Operation; Key Developments | Future demand increases expected to result in queuing back onto this section in the AM peak from the J79 merge, and back from the A1056 in the PM peak. Particularly impacted by the Great Park and Cramlington developments. | A1 West of Newcastle Bypass RBS; Northumberland Local Plan; NewcastleGateshead Local Plan; Seaton Burn PPP Business Case; A1 Adonis Infrastructure Study |
| 18 | J79 | Network Operation; Key Developments | Main junction serving the Great Park development; current queuing to/from A1056. Severe queuing predicted in future to/from A1056 and on approach from Great Park, and back from A1 southbound merge. | A1 West of Newcastle Bypass RBS; NewcastleGateshead Local Plan; A1 Adonis Infrastructure Study |
| 19 | J79 | Institutional | LRN node | |
| 20 | J79 - J78 | Network Operation; Key Developments | Flow breakdown occurs at the merge from J79 in the AM Peak. Conditions predicted to deteriorate due to demands from Great Park development. | A1 West of Newcastle Bypass RBS; NewcastleGateshead Local Plan; A1 Adonis Infrastructure Study |
| 21 | J78 - J79 | Key Developments | Congestion expected in future years due to Great Park Development. | A1 West of Newcastle Bypass RBS; NewcastleGateshead Local Plan |
| 22 | J77 - J79 | Safety | 7 Pedestrian Incidents. | A1 West of Newcastle Bypass RBS |
| 23 | J77 - J79 | Resilience | 60-100 traffic incidents involving a lane closure. | A1 West of Newcastle Bypass RBS |
| 24 | J77 - J79 | Environmental | NOx levels above EU legal limit. | A1 West of Newcastle Bypass RBS |
| 25 | J78 | Institutional | LRN node. | |
| 26 | J78 | Key Developments | Queues on LRN approaches in future years, in part due to demand associated with Great Park Development. | A1 West of Newcastle Bypass RBS; NewcastleGateshead Local Plan; A1 Adonis Infrastructure Study |

| ID | Location | Type | Challenge | Source |
|----|------------------------|-------------------------------------|--|---------------------------------|
| 27 | J78 | Safety/Severance | No footway on Kingston Park Road West; non-controlled crossings only across arms of roundabout where there is a footpath. | |
| 28 | J78-J77 J77-J78 | Physical Constraint | Fawdon Railway Bridge. | |
| 29 | J78-J77 | Network Operation | Queues currently in AM Peak, expected to worsen with development. | A1 West of Newcastle Bypass RBS |
| 30 | J77 | Network Operation; Key Developments | No current issues; Severe queuing is predicted on LRN and A696 approaches associated with Callerton and Airport developments. | A1 West of Newcastle Bypass RBS |
| 31 | J77 | Safety/ Severance | No cycle facilities. Footpath crossings non-controlled. Challenging for cyclists to traverse. | |
| 32 | J76 - J77 | Resilience | 60 - 100 incidents involving lane closure. | A1 West of Newcastle Bypass RBS |
| 33 | J77 - J76 | Network Operation | Flow breakdown at merge in AM period; queuing experienced in AM peak period. | A1 West of Newcastle Bypass RBS |
| 34 | J76 | Institutional | LRN node | |
| 35 | J76 | Network Operation; Key Developments | No current issues; queuing on A6324 westbound approach predicted in 2020, associated with Callerton Park development. | A1 West of Newcastle Bypass RBS |
| 36 | J76 | Safety/ Severance | No cycle facilities. Part time signals potentially confusing for pedestrians. Pedestrian crossings uncontrolled. | A1 West of Newcastle Bypass RBS |
| 37 | J76 - J75 | Network operation | Queuing in both peaks, propagating back from next section; expected to worsen with traffic growth. | A1 West of Newcastle Bypass RBS |
| 39 | J75 - J76 | Network operation | Queuing in AM peak expected to worsen with traffic growth; large volumes joining at J75 then leaving at J76. | A1 West of Newcastle Bypass RBS |
| 40 | J75 - J76 | Safety | 2 KSI 2008 – 2010. | A1 West of Newcastle Bypass RBS |
| 41 | J75 | Network Operation; Key Developments | Extensive queue on A69(T) and A186 approach in both peaks, expected to increase with developments at Callerton. | A1 West of Newcastle Bypass RBS |
| 42 | J75 | Safety/ Severance | No cycle facilities. | |
| 43 | J75 - J74 | Safety | Over 3 RTC per km, concrete walled cutting, affecting visibility, short weaving section. Flow breakdown at merge in AM Peak. Queuing extends back from across Blaydon Bridge on occasions. | A1 West of Newcastle Bypass RBS |
| 44 | J75 - J74 | Network Operation | High level of delay. | |
| 45 | J74 - J75 | Safety | 2.25 - 3 RTC per km. Local road joining slip road causes issues. | A1 West of Newcastle Bypass RBS |
| 46 | J75 - J74 J74 - J75 | Environment | Hadrian's Wall World Heritage site. | English Heritage |
| 47 | J75 - J74 | Environment | Denton Dene LNR. | |

| ID | Location | Type | Challenge | Source |
|----|------------------------|-------------------|---|---|
| 48 | J74 | Network Operation | Queuing back from A695 slip in AM peak. Predicted to worsen in future. | A1 West of Newcastle Bypass RBS; A1 Adonis Infrastructure Study |
| 49 | J74 | Institutional | LRN node. | A1 West of Newcastle Bypass RBS |
| 50 | J74 - J73 | Network Operation | 7.5 - 10% reduced capacity hours, 4000+ Average Monthly Vehicle Delay per km. Is expected to be improved by Metrocentre - Coalhouse scheme. | A1 West of Newcastle Bypass RBS |
| 51 | J74 - J73 | Environment | NOx levels above EU legal limit. | A1 West of Newcastle Bypass RBS |
| 52 | J74 - J73 J73 - J74 | Constraint | Blaydon Bridge. | |
| 53 | J73 - J74 | Network Operation | 2000 - 3000 average monthly vehicle hours delay per km. | A1 West of Newcastle Bypass RBS |
| 54 | J73 | Institutional | LRN node. | |
| 55 | J73 - J72 J72 - J73 | Constraint | Derwenthaugh Bridge. | |
| 56 | J72 - J73 | Constraint | Shibdon Pond SSSI. | DEFRA |
| 57 | J73 - J69 | Network Operation | 7.5 - 10% reduced capacity hours, 4000+ Average Monthly Vehicle Hour Delay per km; is expected to be improved by Metrocentre - Coalhouse scheme; <50% on time reliability. | A1 West of Newcastle Bypass RBS |
| 58 | J73 - J69 | Safety | 18 Pedestrian Incidents 2008 – 2010. | A1 West of Newcastle Bypass RBS |
| 59 | J73 - J69 | Resilience | 100+ incident involving a lane closure. Assumed to be improved by Metrocentre - Coalhouse scheme. | A1 West of Newcastle Bypass RBS |
| 60 | J73 - J69 | Environment | NOx levels above EU legal limit. | A1 West of Newcastle Bypass RBS |
| 61 | J72 - J71 J71 - J72 | Network Operation | Very short weaving section. | A1 West of Newcastle Bypass RBS |
| 62 | J69 - J73 | Network Operation | 2000 - 3000 average monthly vehicle hour delay per km. Expected to worsen with development, and Metrocentre - Coalhouse scheme. | A1 West of Newcastle Bypass RBS |
| 63 | J71 | Network Operation | AM peak queuing on Hollinside Road approach from West. Junction expected to be over capacity in future due to demand from Metrogreen development. | A1 West of Newcastle Bypass RBS |
| 64 | J71 | Institutional | LRN node. | |
| 65 | J70 | Network Operation | No current issues. Junction expected to be over capacity in future due to increased demand from Metrogreen development, and increased throughput due to Lobley Hill scheme. | A1 West of Newcastle Bypass RBS |
| 66 | J70 | Institutional | LRN node. | |
| 67 | J69 | Network Operation | Queuing back on A184 at peak times. | A1 West of Newcastle Bypass RBS; A1 Adonis Infrastructure Study |
| 68 | J69 | Institutional | LRN node | |

| ID | Location | Type | Challenge | Source |
|----|------------------------|-------------------|---|---|
| 69 | J69 -J68 | Network Operation | 4000+ Average Monthly Vehicle Delay per pm; 7.5% to 10% reduced capacity hours. Mitigated by Metrocentre - Coalhouse scheme. In future queuing extends back from Maingate Roundabout in Team Valley Trading Estate, due in part to traffic generated by development in Team Valley. | A1 West of Newcastle Bypass RBS |
| 70 | J69 -J68 | Air Quality | NOx levels above EU legal limit. | A1 West of Newcastle Bypass RBS |
| 71 | J69 -J68 | Safety | 7 Pedestrian Incidents 2008 - 2010, 23.25 - 3 RTC per km. | A1 West of Newcastle Bypass RBS |
| 72 | J69 -J68 | Resilience | 100+ incidents involving a lane closure. | A1 West of Newcastle Bypass RBS |
| 73 | J68 | Institutional | LRN node. | A1 West of Newcastle Bypass RBS |
| 74 | J68 | Network Operation | Extensive queuing on approaches from A692 at peak times, and on B412 in PM peak. Dunston Hill and Team Valley developments will increase pressure on the junction, as will increased throughput from Metrocentre - Coalhouse scheme. | A1 West of Newcastle Bypass RBS; A1 Adonis Infrastructure Study |
| 75 | J68 - J66 | Network Operation | 4000+ Average Monthly Vehicle Delay per km; 7.5% to 10% reduced capacity hours. Mitigated by Metrocentre - Coalhouse scheme, though there is likely to be congestion back from the lane drop at the end of the scheme at Coalhouse. | A1 West of Newcastle Bypass RBS |
| 76 | J68 - J66 | Safety | 2 KSI 2008 - 2010; 17 Pedestrian incidents. Likely to be mitigated by the Metrocentre - Coalhouse scheme. | A1 West of Newcastle Bypass RBS |
| 77 | J68 - J66 | Resilience | 100+ incidents involving a lane closure. Likely to be mitigated by the Metrocentre - Coalhouse scheme. | A1 West of Newcastle Bypass RBS |
| 78 | J66 - J68 | Network Operation | 4000+ Average Monthly Vehicle Delay per km. | A1 West of Newcastle Bypass RBS |
| 79 | J66 - J68 | Safety | 2 KSI 2008 - 2010; 6 Pedestrian incidents. | A1 West of Newcastle Bypass RBS |
| 80 | J66 - J68 | Resilience | 100+ incidents involving a lane closure. | A1 West of Newcastle Bypass RBS |
| 81 | J67 - J68 | Constraint | Scheduled Monument, Ancient Forest. | DEFRA |
| 82 | J67 | Institutional | LRN node. | |
| 83 | J67 | Network Operation | Extensive queuing on Kingsway approach in PM peak and Lamesley Lane in AM peak. Will be exacerbated by Team Valley developments. A LMNS scheme has been designed for partial signalisation, changes to the circulatory carriageway and widening of approaches. | A1 West of Newcastle Bypass RBS; A1 Adonis Infrastructure Study |
| 84 | J67 - J66 | Network Operation | Climbing Lane on Bowes Incline, lost through Eighton Lodge causing congestion. | A1 West of Newcastle Bypass RBS |
| 85 | J67 - J66 J66 - J77 | Constraint | Allerdene Bridge is a concern for long term serviceability. | A1 West of Newcastle Bypass RBS |
| 86 | J66 | Institutional | LRN node. | A1 West of Newcastle |

| ID | Location | Type | Challenge | Source |
|-----|------------------------|-------------------|---|---|
| | | | | Bypass RBS |
| 87 | J66 | Network Operation | Extensive queuing on approach from Durham Road South in AM peak. Queues are expected to increase. In future, queuing back from AM mainline to the south is predicted to impact on the junction operation. | A1 West of Newcastle Bypass RBS; A1 Adonis Infrastructure Study |
| 88 | J66 -J65 J65 - J66 | Environment | Bowes Railway Scheduled Monument. | English Heritage |
| 89 | J66 - J65 | Network Operation | 4000+ Average Monthly Vehicle Hour Delay per km. >10% reduced capacity hours. Heavy weaving. Delays expected to increase in future. Queuing back from Lookout Lake roundabout in PM peak. | A1 West of Newcastle Bypass RBS |
| 90 | J66 - J65 | Safety | 2 KSI 2008 to 2010. 9 pedestrian incidents. | A1 West of Newcastle Bypass RBS |
| 91 | J65 - J66 | Safety | Over 3 KSI 2008 to 2010. | A1 West of Newcastle Bypass RBS |
| 92 | J65 - J66 | Network Operation | Flow breakdown occurs in the AM at the merge. Demand from A1231 and A1(M) exceed available capacity. | A1 West of Newcastle Bypass RBS; A1 Adonis Infrastructure Study |
| 93 | J65 | Network Operation | Extensive queues on A1231 in AM peak from merge. Queuing back from A1231 Lookout Lake Roundabout onto mainline in PM peak. | A1 West of Newcastle Bypass RBS; A1 Adonis Infrastructure Study |
| 94 | J65 - J64 | Network Operation | Merge from A194(M) is predicted to become problematic in future. | A1 West of Newcastle Bypass RBS; A1 Adonis Study |
| 95 | J64 - J65 | Network Operation | 3000-4000 Average Monthly Vehicle Hour Delay per km, with queuing back from merge. County Durham development is likely to increase the issues. | A1 West of Newcastle Bypass RBS |
| 96 | J64 - J65 | Safety | 2.25 - 3 RTC per km. | A1 West of Newcastle Bypass RBS |
| 97 | J64 | Institutional | LRN node. | |
| 98 | J64 | Network Operation | Queuing back from Birtley merge extends back onto Washington Highway. | A1 West of Newcastle Bypass RBS; A1 Adonis Infrastructure Study |
| 99 | J63 - J64 | Network Operation | 2000 -3000 Average Monthly Vehicle Hour Delay per km, due to queuing back from Birtley. | A1 West of Newcastle Bypass RBS |
| 100 | J63 | Institutional | LRN node. | A1 West of Newcastle Bypass RBS |
| 101 | J63 - J64 | Safety | 9 Pedestrian incidents, 2008 - 2009 | A1 West of Newcastle Bypass RBS |
| 102 | J63 | Institutional | LRN node | |
| 103 | J63 | Network Operation | Queuing on approaches from Chester-le -Street in AM peak | A1 West of Newcastle Bypass RBS; A1 Adonis Infrastructure Study |
| 104 | J63 - J62 J62 - J63 | Constraints | River Wear | |
| 105 | J63 - J62 J62 - J63 | Environmental | Lambton Castle Gardens. | A1 West of Newcastle Bypass RBS; A1 Adonis Infrastructure Study |

| ID | Location | Type | Challenge | Source |
|-----|----------|-------------------|---|---|
| 106 | J62 | Institutional | LRN node. | |
| 107 | J62 | Network Operation | Queuing on approaches from Durham in AM peak. This will be exacerbated by developments in Durham, however a mitigation scheme is proposed for the junction. | A1 West of Newcastle Bypass RBS; A1 Adonis Infrastructure Study |

Table 5-1 Route Challenges and Issues

5.4 Underlying cause of problems

5.4.1 The spatial distribution of development and activity chains which give rise to the need to move within the corridor are the fundamental driver of travel demand generally, and hence the ultimate underlying cause of the key issues along the route.

5.4.2 The A1 NGWB, by its very presence, has fostered patterns of activity, development and hence movement on the west side of the Tyne and Wear conurbation which rely upon the accessibility it provides. Although a relatively recent road, with the Newcastle Western Bypass only opening in 1990, these patterns are firmly entrenched. Cutting through the urban area, it was always going to play a variety of roles, from strategic to local, and has come to act as a spine road for new development and largely as a local road.

5.4.3 Population and economic growth in the region requires additional housing and employment land to be identified. Access to the SRN is a key factor in investment decisions, hence the attractiveness of sites along the corridor. The locations which are available and most attractive for such development are located along, or to the west of the corridor, meaning that for many trips to access the key employment areas, and other facilities, people must use, or at least traverse, the corridor, increasing this cycle of dependence.

5.4.4 The imperative for more employment, housing provision and economic growth could serve to reinforce and encourage this pattern of development. It is notable how development locations throughout Tyne and Wear tend to cross the orbital A19/A1/194(M) box. These patterns of development, and hence activity and movement could, without complementary measures, ultimately consume any additional capacity provided. This was the key concern outlined by the Secretary of State in 2003.

5.4.5 Without sensitive design and provision for alternatives to travel by car, or travel at all, for the new developments, the situation will deteriorate. Under these circumstances, and given the level and distribution of development proposed, even if additional capacity were to be provided, the betterment achieved would be short lived. This echoes the concern expressed by the Secretary of State that any additional capacity provided on the A1 NGWB would be taken by local traffic avoiding local congestion issues, and therefore resulting in little benefit for strategic traffic.

5.5 Summary and Conclusions

5.5.1 The review of current and future conditions which will affect the A1 NGWB have led to the summary of specific problems shown in Table 5.1 and Appendix A. In general the conclusions are that:

- Given the current spatial pattern of development, and the demand for travel associated with it, the road in its current form is incapable of meeting the demands placed upon it presently.

- The distribution of future planned development will reinforce these patterns increasing the importance of the A1NGWB as a key *local* artery within the city of Newcastle and Borough of Gateshead.
- Resolving the conflict between the different roles, from local rat-run through to strategic highway is essential to achieving an optimal outcome. Should it be managed as a local road, with a residual strategic function, or should the – comparatively small in number – strategic users be prioritised?
- Problems with the road design exacerbate the problems associated with excess demand.
- It is clear that given the current issues, future development plans and the criticality of the corridor in providing reliable accessibility to enable and foster robust economic growth, that intervention is required.

6 Refined Study Objectives and Area

6.1 Introduction

6.1.1 Chapter 5 summarised the problems experienced in the A1 NGWB corridor and established the need for intervention. Chapter 6 sets out the overall objectives that any such intervention should aim to satisfy.

6.1.2 Along with identified issues these objectives will guide the sifting and assessment of options during Stage 2 of the study.

6.2 Setting the objectives

6.2.1 It is clear from the national policy context through to the concerns of local stakeholders that the key overriding concern for the region is supporting economic growth. Also highlighted in the issues and challenges are those related to other strategic objectives, such as the environment, and national policy objectives related to the social and distributional impacts of interventions.

6.2.2 The next level of objectives, termed intermediate objectives, relate to how the strategic objectives might be delivered, and provide building blocks for them.

6.2.3 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.

6.2.4 It is in this context that the high level objectives for the study have been established. These are shown in Table 6.1

| Objective Type | Objective | Description |
|------------------|--|--|
| Strategic | Facilitating Economic Growth – Jobs | Supporting the role of the A1 NGWB in facilitating job creation and the attractiveness and delivery of current and potential employment locations in the corridor and wider region. In line with SEP – “More and Better Jobs”. |
| | Facilitating Economic Growth – Housing | Supporting the role played by A1 NGWB in facilitating housing developments in the corridor and wider region. |
| | Facilitating Economic Growth – Freight | Maintaining and enhancing the role of corridor in facilitating the movement of goods, and access to transport hubs, in particular ports and airports. |

| | | |
|---------------------|--|---|
| | Social and Distributional – Air Quality | Maintaining air quality with regard to European legal standards. |
| | Social and Distributional – Accessibility | Maintaining and improving accessibility to jobs, housing and key services, with due regard to the needs of non-car users. |
| | Social and Distributional – Disadvantage, Diversity and Equality | Actively challenging patterns of disadvantage and ensuring that interventions take account of the needs of protected groups in potentially affected communities in line with Highways Agency Public Sector Equality objectives. |
| | Environment | Any interventions must be cognisant of the urban and rural environment the corridor passes through and its special features, as well as national environmental objectives and imperatives. |
| Intermediate | Release of Development sites | Mitigation of the constraints placed on specific sites by issues of accessibility and transport system capability. |
| | Optimal targeting of resources | Ensuring that any proposed interventions are targeted to best contribute to the strategic objectives, optimising the benefit from any allocation of scarce resources. |
| | Integration with the Local Road Network | Ensure that interventions on the SRN work in concert with interventions on the LRN, to achieve the best possible outcomes for all. |
| | Multimodal Optimisation | Meeting the derived demand for transport within and traversing the corridor in the optimal way, maximising the use of alternatives to the private car, so as to improve the balance of demand for roadspace and the available supply. |
| | Strategic versus Local Road | Have due regard to the role that the corridor plays in terms of Local versus Strategic link versus connectivity, considering priorities and appropriateness of intervention accordingly. |
| Operational | Reduce Delay | Reduction in delays that occur in the corridor towards benchmark levels. |
| | Improve Safety | Reduction in collisions, in particular incidents involving pedestrians. |

| | | |
|--|----------------------|--|
| | Increase Resilience | Reduction in the impact that perturbations of any kind cause to the transport system. Maintain the condition of the asset. |
| | Increase Reliability | Reduction in the variability in journey times in the corridor. |

Table 6-1: Initial Study Objectives

6.2.5 These objectives are subject to review following stakeholder consultation. In particular, it is noted that 'capacity' is not an objective, as this would at this stage pre-empt the consideration of interventions that will be considered in Stage 2 of the study.

6.3 Geographic Area

6.3.1 The proposed geographical extent for Stage 2 of the study encompasses the road corridor itself, between J62 Carrville and J80 at Seaton Burn, as well as the local road approaches. Also proposed for inclusion are the two key trip generators adjacent to the corridor, namely Team Valley and the Metrocentre, and the Tyne Crossing at Scotswood Bridge, as this has an important symbiotic relationship with the A1 Blaydon Bridge, in terms of trip tidality and route choice.

6.3.2 The study at this stage will concentrate on the road corridor itself, however, should large scale schemes be identified as possibilities, it will be required under Webtag guidance to consider the wider impacts, as well as redistribution and generations, which would require the use of a strategic level analysis and model.

6.3.3 It is noted that the vast majority of journeys using the A1 NGWB are local or regional trips, with only 2% of vehicles passing through J65 Birtley continuing through to J80 Seaton Burn.

6.3.4 It is necessary to take an integrated corridor approach, rather than looking individually at nodes and links, as given the short distance between interchanges, interventions in one section will impact both upstream and downstream as well as the LRN. For example, the slips and merge/diverges at Askew Road would work effectively were it not for the proximity of the Lobley Hill interchange.

7 Conclusions and Recommendations

7.1 Introduction

- 7.1.1 This report represents the culmination of the first stage of a three stage process to develop proposals to mitigate issues and challenges identified along the A1 GNWB, which runs between J65 at Birtley, through to J80 at Seaton Burn. The study also considers the A1(M) immediately to the south, through to J62 at Carville.
- 7.1.2 This report has identified the issues and challenges experienced along the corridor which, if mitigated or resolved, could potentially unlock opportunities for economic development and growth. This is considered in terms of potential sites for commercial and housing development. It has done this by looking at the historical context, current situation and potential future circumstances.
- 7.1.3 These have been drawn together to identify the need for intervention, and subsequently set the objectives for any proposed interventions that are identified in the identification, sift and assessment of options in the next stage of the study.

7.2 Stage 1 Conclusions

- 7.2.1 The corridor has been the subject of a number of studies over recent years, and a number are ongoing. These studies have established the importance of the A1 NGWB in assisting the economic performance of the region and led to a number of potential improvements to the highway network, particularly the A1 Lobley Hill to Dunston Scheme (incorporating extensions to Coalhouse and Metrocentre), which commenced construction in August 2014.
- 7.2.2 The conclusions from the Stage 1 review of the current and future situation in areas relevant to the A1 NGWB are that:
- National, regional and local policies and strategies consider that the A1 NGWB, and improvements to the route, are fundamental to the economic performance of the region;
 - Travel demand data shows that more than 95% of journeys on the A1 NGWB are to, from or within the surrounding area, rather than long-distance trips, emphasising the importance of the route for local and regional journeys;
 - Given the current spatial pattern of development, and the demand for travel associated with it, the road in its current form is incapable of meeting the demands placed upon it presently;
 - There are significant development plans in Durham, Gateshead, Newcastle and Northumberland which will have an impact on travel demand on the A1 NGWB;
 - There are committed highway schemes, principally the Lobley Hill to Dunston Improvement Scheme and the Seaton Burn Pinch Point Scheme, which will address some of the current and future problems on the A1 NGWB;

- Without intervention, conditions on other parts of the A1 NGWB will deteriorate, particularly south of Coalhouse to Birtley and between Scotswood and Ponteland Road to the north of the river;
- Consideration is being given to potential major public transport improvements, such as extensions to the Metro system and reopening of the Leamside Line, which could potentially have an impact on travel demand on the A1 NGWB; but
- In general, committed plans for changes to the transport network are not commensurate with the increase in demand expected due to development and background growth.

7.2.3 It is clear, therefore, that given the current issues, future development plans and criticality of the corridor in providing reliable access to enable and foster robust economic growth, that intervention is required.

7.3 Recommendations

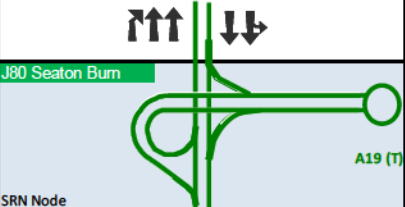
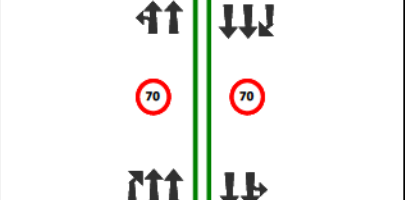
7.3.1 This report, details the first stage of this study, and is commensurate with Transport Appraisal Process Steps 1- 5. It has summarised the challenges and issues pertaining to the corridor, and set objectives by which potential interventions can be assessed.

7.3.2 The recommendations for the next steps are that:

- The issues and problems identified in Chapter 5, and supported by Table 5.1 and Appendix A, are considered in drawing up a long list of options/interventions in Stage 2 of the study; and
- That the resultant long list of options is assessed against the identified issues/problems and the objectives presented in Chapter 6 of this report.

Appendix A

Node & Link Summary

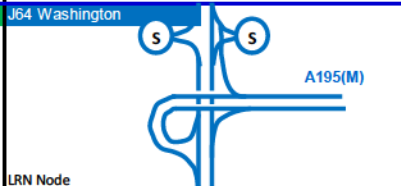
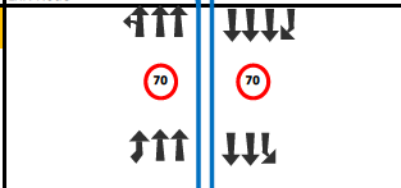
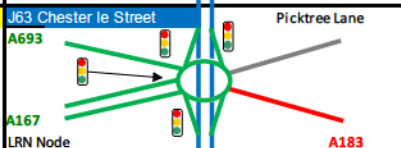
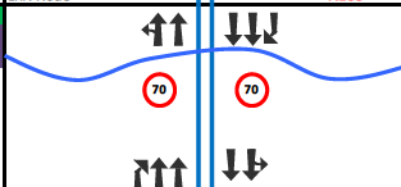
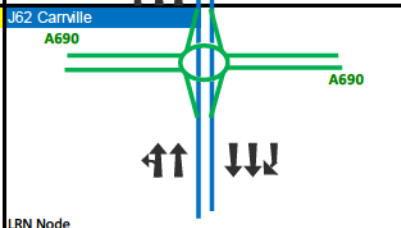
| Northbound - 2020 committed | | Northbound - Current | | Southbound - Current | | Southbound - 2020 committed | |
|--|--|---|--|--|--|---|--|
| No notable issues | | No notable issues |  | No notable issues | | No notable issues | |
| Additional demand to Cramlington - negating pinch point gain | | Peak Queuing back from Roundabout onto mainline | J80 Seaton Bum | Congestion at Fisher Lane Roundabout | | Additional demand from Cramlington - negating pinch point gain | |
| | | Seaton Bum Pinch Point Scheme | SRN Node | Seaton Bum Pinch Point Scheme | | | |
| No notable issues | | No notable issues |  | No notable issues | | Affected by traffic volume and queuing back from North Brunton Merge in AM peak; Traffic queuing back from A1056 in PM peak | |
| | | AADT 27500 | J79 North Brunton | AADT 27200 | | | |
| Increased traffic to/from Great Park dev. Roundabout and slip affected by queuing back from A1056 in PM peak | | No notable issues | J79 North Brunton | Queuing back from A1056 in PM Peak | | Queue back from A1056 expected to impact roundabout at North Brunton | |
| | | | LRN Node | | | | |
| Delays likely to increase due to development traffic Large volumes leaving to Great Park | | Poor Air Quality 7 Pedestrian Incidents 60-100 incidents involving a lane closure | J78 Kingston Park | 2000 - 3000 Average Monthly Vehicle Hour Delay Flow Breakdown at Merge in AM Peak | | Delay likely to increase to next threshold level Flow breakdown in AM likely to propagate back to next link | |
| | | AADT 37300 (RIU sector is J77-J79) | J78 Kingston Park | AADT 36600 (RIU sector is J77-J79) | | | |
| Queues on approaches in peak | | | J78 Kingston Park | No notable issues | | Queues on approaches in peak | |
| | | | Kingston Park Road | | | | |
| | | | LRN Node | | | | |

| Northbound - 2020 committed | Northbound - Current | | Southbound - Current | Southbound - 2020 committed |
|--|--|---------------------------------|--|---|
| Development likely to increase delay to next threshold level | Poor Air Quality 60-100 incidents involving a lane closure Fawdon Metro Bridge | | 2000 - 3000 Average Monthly Vehicle Hour Delay per km Flow Breakdown at Merge in AM Peak Fawdon Metro Bridge | Delay likely to increase to next threshold level |
| | AADT 37300 (RIU sector is J77-J79) | | AADT 36600 (RIU sector is J77-J79) | |
| Severe queuing on approach from A696 in both peaks related to Callerton and Airport Developments | No notable issues | J77 Ponteland Road B6918 | No notable issues | Severe queuing on approach from City in PM peak related to Callerton and Airport Developments |
| Increased demand at developments on A696 | 60-100 incidents involving a lane closure | | 2000 - 3000 Average Monthly Vehicle Hour Delay per km Flow Breakdown at Merge in AM Peak | Delay likely to increase to next threshold level increase demand from developments from A696 |
| | 42700 AADT (RIU sector is J76 - J77) | | 41700 AADT (RIU sector is J76 - J77) | |
| No notable issues | No notable issues | J76 Stamfordham B6324 | No notable issues | Queuing in PM in approach |
| Delay likely to increase to next threshold level | 2000 - 3000 Average Monthly Vehicle Hour Delay per km 2 KSI 2008-2010 Flow Breakdown at Merge in AM Peak | | 2000 - 3000 Average Monthly Vehicle Hour Delay per km Poor Air Quality | Delay likely to increase, propagating back from next section |
| | 47100 (AADT RIU sector is J75 -- J76) | | 46300 AADT (RIU sector is J75- J76) | |
| Extensive queuing on A69 - extending further Impacted by development at Callerton | Extensive queue on A69 in both peaks Safety issue with very minor road joining slip road | J75 Denton Burn A69 (T) | Extensive queue on A186 in both peaks | Extensive queuing on A186 - extending further Impacted by development at Callerton |
| | | | | |

| Northbound - 2020 committed | Northbound - Current | | Southbound - Current | Southbound - 2020 committed |
|--|---|---|--|---|
| Delay likely to increase to next threshold level conditions related to incidents remain | 2000 - 3000 Average Monthly Vehicle Hour Delay per km 2.25 - 3 RTC per km Poor Air Quality 60-100 incidents involving a lane closure Short weaving section on curved alignment Concrete walled cutting Hadrian's Wall World Heritage Site | | 3000 - 4000 Average Monthly Vehicle Hour Delay Over 3 RTC per km Short weaving section, on curved alignment Concrete walled cutting - affects visibility Flow Breakdown at Merge in AM Peak Hadrian's Wall World Heritage Site Denton Dene LNR | Delay likely to increase to next threshold level |
| Queuing back from merge/weaving section Likely to increase to next threshold level | 46700 (RIU sector is J74 - J75) | J74 Scotswood LRN node | 45200 AADT (RIU sector is J74 - J75) Queuing back from A695 slip AM peak | Queuing back from slip - extending back to mainline |
| Delay propagating from merge at Spotswood Likely to increase to next threshold level | 2000 - 3000 Average Monthly Vehicle Hour Delay per km Blaydon Bridge - River Tyne | | 4000+ Average Monthly Vehicle Hour Delay 7.5-10% reduced capacity hours Poor Air Quality Blaydon Bridge - River Tyne AADT drop compared to NB suggests behavior to avoid worse congestion on SB carriageway. AADT 34800 (RIU sector is J73 - J74) | Average Monthly Vehicle Hour Delay decreases due to Metrocentre - Coalhouse scheme |
| No notable issues | AADT 43000 (RIU sector is J73 - J74) | J73 Derwenthaugh A694 LRN Node | No notable issues AADT drop compared to NB suggests behavior to avoid worse congestion on SB carriageway. | No notable issues |
| Delay propagating from merge at Spotswood Likely to increase to next threshold level | 2000 - 3000 Average Monthly Vehicle Hour Delay per km Shibdon Pond SSSI Derwenthaugh Bridge - River Derwenthaugh | | 4000+ Average Monthly Vehicle Hour Delay 7.5-10% reduced capacity hours Poor Air Quality 18 Pedestrian Incidents Derwenthaugh - Askew Road 60-100 incidents involving a lane closure Derwenthaugh Bridge - River Derwenthaugh AADT 42100 (RIU sector is J69 - J73) | Average Monthly Vehicle Hour Delay decreases due to Metrocentre - Coalhouse scheme Pedestrian issues assumed to be mitigated by Metrocentre - Coalhouse scheme |
| No notable issues | AADT 48500 (RIU sector is J69 - J73) | J72 Swalwell B6317 LRN Node | No notable issues | No notable issues |
| Lane drop at Swalwell causing congestion, more traffic allowed through to this point by Lobley Hill scheme | 2000 - 3000 Average Monthly Vehicle Hour Delay per km Very High Flows v. benchmark Poor Air Quality | | 4000+ Average Monthly Vehicle Hour Delay 10%+ Reduced Capacity Hours <50% On-time reliability Poor Air Quality 18 Pedestrian Incidents Derwenthaugh - Askew Road 100+ incidents involving a lane closure | Average Monthly Vehicle Hour Delay decreases due to Lobley Hill scheme Safety issues assumed to be mitigated by Metrocentre - Coalhouse scheme |
| AM increased queuing on Hollinside Road | AADT 48500 (RIU sector is J69 - J73) | J71 Metrocentre Hollinside Road LRN Node | AADT 42100 (RIU sector is J69 - J73) | Junction over capacity increase demand due to Metrogreen |

| Northbound - 2020 committed | Northbound - Current | | Southbound - Current | Southbound - 2020 committed |
|---|---|---|--|---|
| Delays propagating from lane drop at Swalwell | V High Flows v. benchmark 2000 - 3000 Average Monthly Vehicle Hour Delay AADT 48500 (RIU sector is J69 - J73) | | 4000+ Average Monthly Vehicle Hour Delay 10%+ Reduced Capacity Hours Poor Air Quality 18 Pedestrian Incidents Derwenthaugh - Askew Road 100+ incidents involving a lane closure AADT 42100 (RIU sector is J69 - J73) <i>Metrocentre - Coalhouse Scheme</i> | Average Monthly Vehicle Hour Delay decreases due to Metrocentre - Coalhouse scheme Safety issues assumed to be mitigated by Metrocentre - Coalhouse scheme |
| Junction over capacity | No notable issues Recent Scheme provided 3 narrow through lanes | J70 Dunston Park Terrace Dunston Road LRN Node | No notable issues | Increased demand and queues related to Metrogreen on Dunston Road |
| Delays propagating from lane drop at Swalwell | V High Flows v. benchmark 2000 - 3000 Average Monthly Vehicle Hour Delay Poor Air Quality AADT 48500 (RIU sector is J69 - J73) <i>Metrocentre - Coalhouse Scheme</i> | | 4000+ Average Monthly Vehicle Hour Delay 10%+ Reduced Capacity Hours <50% On-time reliability Poor Air Quality 18 Pedestrian Incidents Derwenthaugh - Askew Road 100+ incidents involving a lane closure AADT 42100 (RIU sector is J69 - J73) <i>Metrocentre - Coalhouse Scheme</i> | Queuing back from Maingate Roundabout impact Askew Road - Development at Team Valley Safety issues assumed to be mitigated by Metrocentre - Coalhouse scheme |
| No notable issues | No notable issues | J69 Askew Road LRN Node | Queuing back on A184 at peak times | Queuing back from Maingate Roundabout impact Askew Road - Development at Team Valley |
| Monthly Delay reduced due to Coalhouse - Metrocentre scheme | Very High Flows 4000+ Average Monthly Vehicle Hour Delay <50% On-time reliability Over 3 RTC per km Poor Air Quality AADT 52500 (RIU sector is J68 - J69) <i>Metrocentre - Coalhouse Scheme</i> | | Very High Flows 4000+ Average Monthly Vehicle Hour Delay 7.5-10% reduced capacity hours 2.25-3 RTC per km Poor Air Quality 7 Pedestrian Incidents 100+ incidents involving a lane closure AADT 55100 (RIU sector is J68 - J69) <i>Metrocentre - Coalhouse Scheme</i> | Queuing back from Maingate Roundabout impacting on mainline - Development at Team Valley Overspill queue has safety implications |
| Queuing back through roundabout from Maingate | Extensive queuing on A692 at peak times Recently signalised - bus priority scheme | J68 Lobley Hill A692 B4126 LRN Node | Extensive queuing to/from B4126 at peak times - Queuing from Maingate Roundabout in Team Valley Recently signalised - bus priority scheme | Roundabout over capacity, Queuing back through roundabout from Maingate Roundabout |
| Monthly Delay reduced due to Coalhouse - Metrocentre scheme | 4000+ Average Monthly Vehicle Hour Delay 2 KSI 2008-2010 Eighton Lodge - Lobley Hill 6 Pedestrian Incidents Eighton Lodge - Lobley Hill 100+ incidents involving a lane closure Eighton Lodge - Lobley Hill Scheduled Monument - Ravensworth Coal Mill Grade II Listed Building - South Lodge AADT 44300 (RIU sector is J66 - J68) <i>Metrocentre - Coalhouse Scheme</i> | | 4000+ Average Monthly Vehicle Hour Delay 7.5-10% reduced capacity hours 2 KSI 2008-2010 17 Pedestrian Incidents Lobley Hill - Eighton Lodge 100+ incidents involving a lane closure AADT 46100 (RIU sector is J66 - J68) <i>Metrocentre - Coalhouse Scheme</i> | Queuing back from lane drop at Coalhouse |

| Northbound - 2020 committed | Northbound - Current | | Southbound - Current | Southbound - 2020 committed |
|---|---|---|--|---|
| Queuing on Lamesley Lane increases | Extensive Queue on Lamesley Lane in AM LNMS scheme for partial part time signalisation has been designed River Team | J67 Coalhouse Team Valley - Kingsway Lamesley Lane Team Valley LRN Node | Extensive queuing on Kingsway in PM peak LNMS scheme for partial part time signalisation has been designed River Team | Queuing on Kingsway increase - development at Team Valley. LNMS scheme not committed |
| Monthly Delay reduced due to Coalhouse - Metrocentre scheme | V High Flows v. Benchmark 4000+ Average Monthly Vehicle Hour Delay 2 KSI 2008-2010 Eighton Lodge - Lobley Hill 6 Pedestrian Incidents Eighton Lodge - Lobley Hill 100+ incidents involving a lane closure EL-LH Allerdene Bridge maintenance/replacement issue | | 4000+ Average Monthly Vehicle Hour Delay 7.5-10% reduced capacity hours 2 KSI 2008-2010 17 Pedestrian Incidents Lobley Hill - Eighton Lodge 100+ incidents involving a lane closure Allerdene Bridge maintenance/replacement issue Climbing Lane Gain and drop | Monthly Hour Delay increases |
| Queues on Durham Road increase markedly | Extensive queuing on Durham Road in AM Park - RA west Scheduled Monument - Bowes Railway | J66 Eighton Lodge A167 LRN Node | No notable issues - roundabout east Mainline Lane Drop through junction causes issues Scheduled Monument - Bowes Railway | Queuing now occurs through to Durham Road |
| Weaving, and hence safety issues remain | Very High Flows v. Benchmark Over 3 KSI 2008-2010 Heavy Weaving | | Very High Flows v. Benchmark 4000+ Average Monthly Vehicle Hour Delay 10%+ Reduced Capacity Hours 2 KSI 2008-2010 9 Pedestrian Incidents Heavy Weaving | Monthly Hour Delay increases |
| Problematic Merge remains associated issues worsen | Problematic Merge AM Peak queuing back onto Sunderland Highway | | PM queuing back from Sunderland Highway Turbulence on merge from A194(M) | Queuing back from Sunderland Highway affecting mainline |
| Queuing back from Birtley Merge increases | 3000 - 4000 Average Monthly Vehicle Hour Delay 2.25-3 RTC 2008 - 2010 Extensive queue in AM peak from Birtley Merge | J65 Birtley A1 SRN Node LRN Node | No notable issues | Increased turbulence on section, merge from A194(M) becomes problematic |
| | AADT 44300 (RIU sector is J66 - J68) | | AADT 44300 (RIU sector is J66 - J68) | |
| | AADT 51200 (RIU sector is J65 - J66) | | AADT 47300 (RIU sector is J65 - J66) | |
| | AADT 38500 (RIU sector is J64 - J65) | | AADT 42900 (RIU sector is J64 - J65) | |

| Northbound - 2020 committed | | Northbound - Current | | Southbound - Current | Southbound - 2020 committed |
|--|--|---|--|---|-----------------------------|
| Queuing back from Birtley Merge impact on Washington Highway | | No notable issues |  <p>J64 Washington LRN Node</p> | No notable issues | No notable issues |
| Queuing back from Birtley Merge increases | | 2000 - 3000 Average Monthly Vehicle Hour Delay 9 Pedestrian Incidents |  <p>J63 Chester le Street LRN Node</p> | No notable issues | No notable issues |
| Increased Development in Chester-le-Street | | AADT 40200 (RIU sector is J63 - J64) Queuing on approaches AM peak |  <p>J62 Carrville LRN Node</p> | AADT 41500 (RIU sector is J63 - J64) No notable issues | No notable issues |
| No notable issues | | No notable issues Grade II listed - Lambton Castle Gardens River Wear |  <p>J62 Carrville LRN Node</p> | No notable issues Grade II listed - Lambton Castle Gardens Lindly Wood Remains of Coal Workings River Wear | No notable issues |
| Residential biased development in Durham increases commuter flows to Regional Centre | | No RIU data available Queuing on approaches AM peak |  <p>J62 Carrville LRN Node</p> | No RIU data available No notable issues | No notable issues |