

Trans-Pennine Routes Feasibility Study

Stage 1 Report

February 2015

This report has been prepared for the Highways Agency and the Department for Transport by Mouchel Ltd.



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1 Executive Summary

1.1 Context and Background

- 1.1.1 The Department for Transport has commissioned a number of Feasibility Studies to investigate solutions to some of the most significant and longstanding congestion hot-spots in the country. The aim of this feasibility study is to identify the opportunities and understand the case for future investment on trans-Pennine routes that will improve connectivity between Manchester and Sheffield, and that are deliverable, affordable and offer value for money.
- 1.1.2 The study considers the current trans-Pennine road routes which include the A57, A628, A616 and A61 in terms of the strategic road network, as well as the A57, A6, A623, A624, A625, A6187 and A6103 on the local authority road network. The study also includes the Hope Valley railway line.
- 1.1.3 The modal scope of the study is predominantly road-based and considers potential investment proposals on both the strategic and local authority road networks. The study also aims to understand the contributions that current rail investments plans may bring to trans-Pennine connectivity and be aware of and understand further potential proposals that may emerge from other related transport investment planning processes.
- 1.1.4 The feasibility study does not consider specific issues or proposals in relation to other parts of the strategic road network in the vicinity, as the case for further future investment is being considered as part of the Highways Agency's South Pennines Route Strategy, or within other specific feasibility studies.
- 1.1.5 The study has followed three stages and this report provides the outputs from Stage 1 and follows Steps 1 to 4b of the WebTAG Transport Appraisal Process.
- 1.1.6 Stage 1 focusses on understanding the current and future situations in the study area, establishing the need for intervention and identifying the objectives for any future proposals to resolve the issues identified. In completing Stage 1, a range of policies, previous studies and primary data have been reviewed and analysed to provide a firm basis for further analysis and option development.
- 1.1.7 As part of the engagement process through the three stages of the feasibility study, a Stakeholder Reference Group was established and it was involved at both the commencement and completion of Stage 1. In addition, engagement was undertaken as part of Stage 1 with a number of individual stakeholder organisations to collate information and views on the current and future performance of the trans-Pennine transport network.

1.2 The Current and Future Situation

- 1.2.1 This Stage 1 report has highlighted the importance to the economy of greater connectivity across the whole of the north, not just between Manchester and

Sheffield. Improvements to connectivity locally and between cities and regions are seen as fundamental to the future of the northern economies. HS2 is seen as a major opportunity and catalyst for growth and the city regions expect to see capacity on existing routes released. However, as highlighted in both the Higgins Reports and the One North Report, further investment in east-west transport corridors in the North, including between Manchester and Sheffield, is seen as vital. The Higgins Report of October 2014 also highlighted other opportunities to improve east-west connectivity across the North and the Government has given its backing to 'HS3', a high speed link connecting the North's cities.

- 1.2.2 The most significant challenges to connectivity between Manchester and Sheffield are the journey times across the Pennines, increased by congestion at key locations, including junctions in the urban areas of the A57/A628 and on the A6 into Stockport. These issues are exacerbated by the lack of journey-time reliability generated by the frequent closure of routes due to poor weather and accidents.
- 1.2.3 Rail connectivity is restricted by the limited services (two fast and one slow trains per hour) between Manchester and Sheffield). However, proposals for improvements to the Hope Valley Line as part of the Northern Hub, and potentially electrification in the long term, are opportunities to bring improvements to connectivity.
- 1.2.4 The trans-Pennine routes face a number of operational challenges. The HA's A57/A628/A616/A61 strategic route experiences a road closure every 11 days on average with two third of these being longer than two hours and some 77% of these closures are the result of either road traffic collisions or bad weather. The non-trunk routes are also prone to weather-related closures.
- 1.2.5 Maintenance presents an operational challenge due to the majority of the trans-Pennine routes being single carriageway, resulting in one lane operation, reducing the capacity of the route and causing significant delays on the busiest sections of route. Furthermore, the trans-Pennine routes currently lack significant technology systems, including on the HA's routes. This reduces the ability of the HA and local authorities to manage incidents on the routes and provide information to travellers.
- 1.2.6 The condition of the highways assets presents some significant challenges within the trans-Pennine routes network both on the HA's routes and the local authority roads. Much of the A57/A628/A616/A61 route was constructed prior to being managed by the HA and is therefore constructed to a lower standard and is prone to requiring deep structural repairs, which could have significant impacts on network operation. There are also significant challenges related to maintenance of retaining walls, damage from accidents, drainage-related earthworks defects and risk of land slippage.
- 1.2.7 While current traffic flows on the trans-Pennine routes appear to be within the theoretical capacity of the individual highway links, significant delays are caused by a number of junctions, the most notable being those on the HA's route in the urban areas of the A57, particularly the A57/B6174 junction, and the A616/A61 junction at the eastern end of the route. On the local road network, the A57 north of Glossop

suffers from congestion, particularly at its junction with Woolley Bridge Road and the A628. A recent study has also revealed that the urban section of the A6 heading into Stockport suffers from severe network stress.

- 1.2.8 Parked cars in the built up areas and slower moving vehicles, with speeds reduced further by significant gradients and horizontal alignment, cause delays to traffic, particularly where opportunities to pass are limited. However, junctions are the primary cause of delays on the routes.
- 1.2.9 While the current traffic flows between junctions are within the designed capacity of the road and the A57 and the A6 are likely to be operating close to their link capacity in 20 years' time, as will the A625 into Sheffield. The performance of those junctions identified above will also deteriorate further if no improvements are made.
- 1.2.10 The environmental challenges within the trans-Pennine area are widespread and significant. The majority of trans-Pennine routes pass through the Peak District National Park, while HA's route is also constrained by a number of landscape and conservation designations, as well as nine Defra Important Areas for Noise and four Air Quality Management Areas. The majority of the local authority roads also pass through the National Park, while A6, A57 and A625 pass through Air Quality Management Areas and the same roads, plus the A628, have Important Areas for Noise.
- 1.2.11 Accidents are identified as a significant challenge for trans-Pennine routes and lead to issues for journey-time reliability and maintenance. Analysis of the HA's route and has revealed that sections of the A628, A616 and A61 have personal injury accident rates above the national average. The A628, along with the A61, suffers from a high proportion of accidents during severe weather conditions, while also experiencing a higher than average accidents for accidents at night. The A628 also experiences a high number of pedestrian accidents within the urban section through Tintwistle at its western end. Accidents are primarily focussed at junctions, with a number of clusters on the HA's route but also on the non-trunk A57.
- 1.2.12 The social challenges within the trans-Pennine routes primarily focus on severance where major routes interact with urban areas and the resulting increased levels of pedestrian activity.

1.3 Current Challenges and Priorities

- 1.3.1 The challenges identified have been prioritised to ensure that the next stages focus on the most important problems faced by the trans-Pennine routes. An assessment has been made on the basis of whether the challenges have a direct impact on connectivity between Manchester and Sheffield. The following is a summary of these high priority challenges:
 - Journey-times are increased by delays at junctions and the geometry and topography of routes;

- Long term traffic growth will bring some urban sections of routes to their capacity.
- Accidents reduce journey time reliability, with high accident rates on some routes and a number of accident clusters;
- Severe weather causes road closures which reduce journey time reliability;
- Maintenance on single carriageway sections reduces journey-time reliability;
- Asset condition, including the standard, age and damage to infrastructure, reduce journey-time reliability through significant maintenance operations and risk from closures; and,
- There is a lack of technology to assist in the operation and management of the routes and provide information for travellers.

1.4 Intervention Objectives

1.4.1 The identification of challenges faced on the trans-Pennine routes has resulted in the development of objectives, as directed by the WebTAG Transport Appraisal Process:

1.4.2 The following objectives have been developed for the trans-Pennine routes:

- **Connectivity** – improving the connectivity between Manchester and Sheffield through reduction in journey times and improved journey-time reliability;
- **Environmental** – avoiding unacceptable impacts on the natural environment and landscape in the Peak District National Park, and optimising environmental opportunities;
- **Societal** – improving air quality and reducing noise impacts, and addressing the levels of severance on the trans-Pennine routes in urban areas;
- **Capacity** – reducing delays and queues that occur during peak hours and improving the performance of junctions on the routes;
- **Resilience** – improving the resilience of the routes through reductions in the number of incidents and reduction of their impacts; and,
- **Safety** – reductions in the number of accidents and reductions in their impacts.

2 Introduction and Purpose

2.1 Preamble

2.1.1 Mouchel has been appointed by the Highways Agency (HA) to undertake a feasibility study into improving connectivity between Manchester and Sheffield across the trans-Pennine routes. This report presents the findings of the first of three feasibility study stages and sets out the challenges to connectivity identified on those routes.

2.2 Wider Context of the Investment Process

2.2.1 Following the 2013 Spending Review, the Government announced proposals for the upgrade of the Strategic Road Network (SRN). The HM Treasury document, Investing in Britain's Future (July 2013) set out details of a programme for infrastructure investment and as part of that the Government announced that it will identify and fund solutions, initially through feasibility studies to look at problems and identify potential solutions to tackle some of the most notorious and long-standing road hot spots in the country. The locations identified for the feasibility studies included:

- The A303/A30/A358 corridor;
- The A1 north of Newcastle;
- The A1 Newcastle and Gateshead western bypass;
- The A27 corridor (including Arundel and Worthing);
- trans-Pennine routes; and,
- The A47/A12 corridor between Peterborough and Great Yarmouth.

2.2.2 These studies were progressed by the HA alongside its Route Strategy programme which is considering the current and future performance of the entire national network, to inform future investment decisions.

2.3 Aims and Objectives

2.3.1 The aim of the trans-Pennine Routes feasibility study was to identify the opportunities and understand the case for future investment solutions on trans-Pennine routes that will improve connectivity between Manchester and Sheffield, and that are deliverable, affordable and offer value for money.

2.3.2 The specific objectives of the study were to:

- a) Establish the current and potential future performance, and the scale of current connectivity for the identified trans-Pennine routes.
- b) Review previous proposals and current investment plans to identify and assess the case for, deliverability and timing of solutions that could address existing

and future problems on the trans-Pennine routes and improve trans-Pennine connectivity between Manchester and Sheffield.

- c) Understand the balance of benefits and impacts from potential individual investment proposals and any additional benefits or impacts from an investment on a corridor or package basis.
- d) Evidence where possible, of the wider economic benefits from the transport investment in improvements to trans-Pennine connectivity.

2.3.3 There were also a number of questions that need to be addressed as part of the study work, and these are set out below:

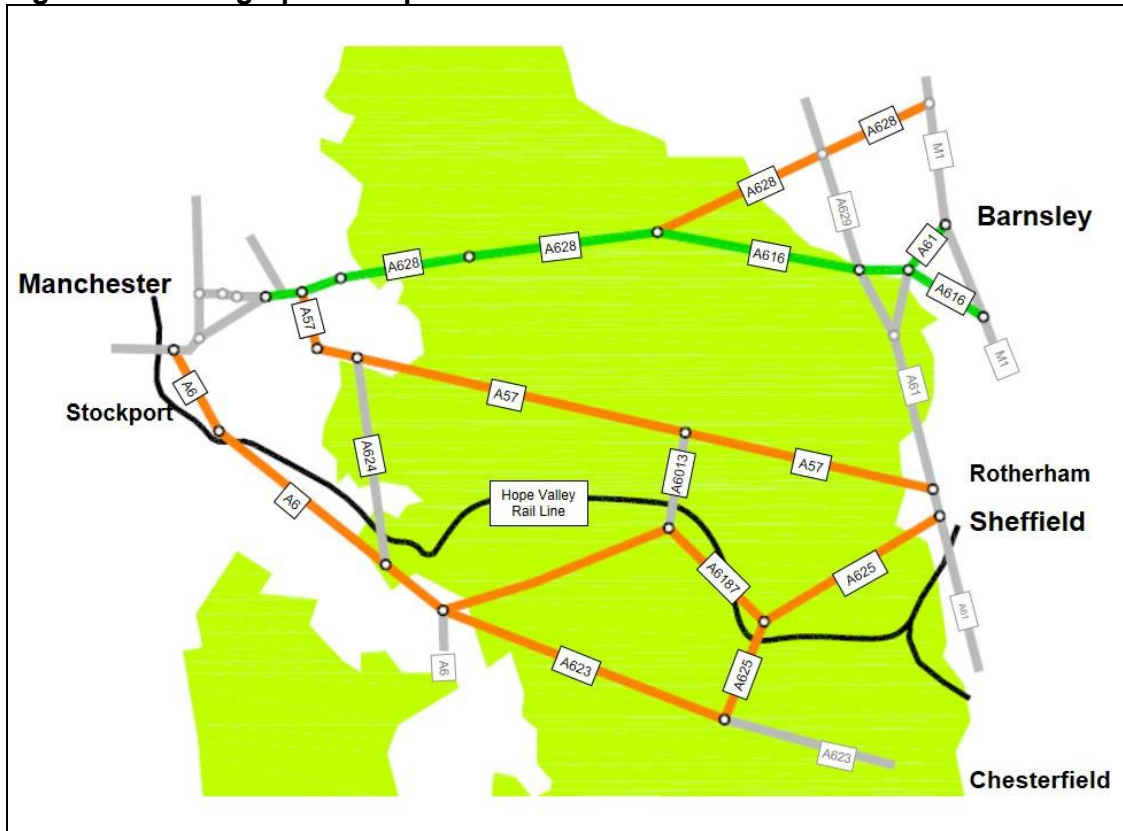
- Given the assessment of current and future performance, and the current levels of connectivity of the trans-Pennine routes, are there specific priority locations/problems that should be addressed?
- Are there viable potential solutions to these problems which are deliverable, affordable and offer value for money, within the timescales of available funding?
- What are the potential timescales for the delivery of identified potential solutions?
- Are there additional benefits or impacts from combinations or packages of potential solutions over and above those for individual solutions?
- Have the potential solutions identified fully considered and optimised the environmental opportunities and mitigation that 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?

2.3.4 Of these six questions, this Stage 1 Report is primarily focussed on answering the first.

2.4 Geographic Scope

2.4.1 The geographic scope of the study, as defined by the Department for Transport, considers the current trans-Pennine road and rail routes which include the A57, A628, A616 and A61 in terms of the strategic road network, as well as the A57, A6, A623, A624, A625 and A6187 on the local authority road network. The study scope also included the Hope Valley railway line. A map of the geographical scope of the study is included in Figure 2-1 below.

Figure 2-1 – Geographic Scope



- 2.4.2 The A6013 was also considered by the study as analysis shows it provides a link between the A6187 and A57 which could be used for strategic movements.

2.5 Modal Scope

- 2.5.1 The modal scope of the study was predominantly road-based and considers potential investment proposals on both the strategic and local authority road networks. The study also aimed to understand the contributions that current rail investments plans may bring to trans-Pennine connectivity and be aware of and understand further potential proposals that may emerge from the Northern Electrification Taskforce set up by the Secretary of State for Transport.
- 2.5.2 The feasibility study did not consider specific issues or proposals in relation to other parts of the strategic road network in the vicinity, as the case for further future investment will be considered as part of the Highways Agency's South Pennines Route Strategy, or within other specific feasibility studies.

2.6 Study Stages

- 2.6.1 This study was undertaken in three stages aligned by the WebTAG Transport Analysis Guidance on the Transport Appraisal Process.

Stage 1: Review of evidence and identification of problems along the routes (WebTAG Steps 1 to 4b)

- 2.6.2 The first stage of this study, of which this report is the main output, was focussed on reviewing any relevant evidence gathered as part of the Highways Agency's South Pennines Route Strategy, together with evidence from any other relevant study work and analysis related to trans-Pennine connectivity, to form a view as to the nature and scale of current and future performance of the relevant routes, and the scale of current connectivity.
- 2.6.3 The study provides details of previous historical work and decisions taken in terms of investment or management of the trans-Pennine road routes.
- 2.6.4 In Stage 1, the study also aimed to establish both the availability of transport modelling and the need to undertake specific transport modelling to provide analysis and evidence to answer some of the questions to be addressed by the study.

Stage 2: Work to finalise the range of proposals that could address the problems along the trans-Pennine routes (WebTAG Steps 5 to 9)

- 2.6.5 Once the problems along the routes had been identified, the second stage reviewed previous work, including proposals for the strategic and local authority road networks, and the rail network to identify proposals that could address the priority problems.
- 2.6.6 This second stage of work culminates in the production of an Option Assessment Report.

Stage 3: Work to assess the affordability, value for money and deliverability of prioritised proposals (WebTAG Step 10)

- 2.6.7 Stage 3 of the study developed the investment business cases for each of the prioritised proposals.
- 2.6.8 Work would also be completed to consider the benefits and business cases for each of the transport investment proposals as well as the cumulative or additional benefits and impacts from combinations or packages of investment.
- 2.6.9 Due to the time constraints of the study the development of full investment business cases for each of the prioritised proposals was not possible. The study would therefore also document any additional work necessary to be able for an investment decision to be made. The length of time needed to complete this additional work would be documented.

2.7 Stakeholder Engagement

- 2.7.1 Stakeholder engagement has been undertaken throughout the feasibility study. At the commencement of the study, a Stakeholder Reference Group was formed (comprising MPs, LEPs, City Regions, local authorities, business organisations,

environmental groups and transport organisations) and this group was engaged both as the study began and at the end of Stage 1. In addition, engagement has been undertaken with individual organisations, this being primarily focussed on city regions, LEAs, transport authorities and local councils, to gather more specific information of policies, strategies and current performance of the transport network.

3 Background and Historical Work

3.1 Route Strategies

- 3.1.1 This feasibility study was undertaken in parallel to the HA's Route Strategies programme and in particular was both informed by and fed into the South Pennines Route Strategy.
- 3.1.2 The Route Strategies were a recommendation from the *A Fresh Start for the Strategic Road Network*¹ report published in November 2011, which recommended that the HA produce these strategies, working with Local Enterprise Partnerships and local authorities. Three pilot studies of the process to develop the strategies were completed and the process has now been rolled out further.
- 3.1.3 Route Strategies are developed in two stages; firstly an evidence gathering stage to assess the current performance of the routes and the potential future challenges. In particular, this stage assesses issues concerned with asset condition and operational requirements, particularly related to supporting economic growth.
- 3.1.4 The second stage of the process takes forward the evidence from the first stage to a programme of work to identify potential solutions to the main challenges and opportunities facing the route. Interventions are likely to cover those related to operation and maintenance but could also include improvement schemes. The identification and appraisal of interventions will result in the development of operational and investment priorities for the period April 2015 to March 2021.

3.2 Approach

- 3.2.1 Stage 1 of this feasibility study focussed on collating and analysing a range of documentation and information related to the current conditions on and surrounding the trans-Pennine routes covering both the strategic and local road networks, as well as the Hope Valley railway line.
- 3.2.2 Stage 1 broadly took two approaches to providing a contemporary understanding of connectivity across the Pennines, between Manchester and Sheffield; the first being through the collation and analysis of a range of documentation and datasets, and the second through engagement with a range of stakeholders.
- 3.2.3 The collation and review of documentation and information has primarily focussed on:
- Existing policy documents, previous and ongoing relevant studies, and current investment proposals;
 - Highways traffic data including flows, journey time, speed and link capacity;

¹ A Fresh Start for the Road Network, November 2011, Department for Transport

- Accident data and road closure information;
- High level land use development information;
- Environmental constraints; and,
- Highway Design Standards.

3.2.4 Key documents reviewed as part of the above process are highlighted in the following table.

Table 3-1 – Existing Policy Documents and Previous and Ongoing Studies

Category	Event
National Policies	Transport White Paper: Creating Growth, Cutting Carbon – Making Sustainable Local Transport Happen (2011)
	National Planning Policy Framework (2012)
	Investing in Britain's Future (HM Treasury) (2013)
	Action for Roads: A Network for the 21st Century (2013)
	English National Parks and the Broads – UK Government Vision and Circular 2010
Wider Regional Policy and Strategy	The Northern Way – First Growth Strategy Report (2004)
	HS2 Plus – A Report by David Higgins (2014)
	Rebalancing Britain – From HS2 towards a national transport Strategy (2014)
	One North – A Proposition for an Interconnected North (2014)
	Greater Manchester Growth and Reform Plan Strategic Economic Plan (2014)
	D2N2 Strategic Economic Plan (2014)
	Sheffield City Region LEP Strategic Economic Plan: Growth Plan 2014
Wider Area Transport Strategies and Studies	South East Manchester Multi Modal Study (SEMMMS) (2001)
	South & West Yorkshire Multi Modal Study (SWYMMS) (2002)
	South Pennines Integrated Transport Strategy (SPITS) (2005)
	The Northern Hub project (2010)
	Greater Manchester Local Transport Plan 3 (2011)
	Derbyshire Local Transport Plan 3 (2011)
	South Yorkshire Local Transport Plan 3 (2011)
	National Networks Trans-Pennine Connectivity Study (2011)
	Derbyshire County Council Trans-Pennine Connectivity Study (2012)
	Greater Manchester Pinch Point Fund Bid (2013)
	M62 Junctions 18-29 Route Strategy (2013)
	South Pennines Route Strategy Evidence Reports (2014)

Category	Event
	High Peak Local Plan Transport Study Final Draft (2014)
	A6 Corridor Study Final Draft Report (2014)
Route Specific Strategies and Studies	Statement of Case for Mottram–Tintwistle Bypass Public Inquiry (2007)
	Longdendale Integrated Transport Strategy (LITS) (2010)
	A57 A628 A616 Strategy Summary (2010)

Stakeholder Engagement

3.2.5 Stakeholders were consulted on a number of occasions during the course of the Stage 1 of the Feasibility Study. Two Stakeholder Reference Group meetings were held during Stage 1, the first at the commencement of the study with the second held as the stage concluded. The first meeting introduced the study to stakeholders and focused on the proposed study scope, timescales and staging, and governance arrangements. The second meeting presented the outputs from Stage 1 and included discussion of the evidenced need and objectives for intervention, and introduced the process and tasks for Stage 2. The membership of the Stakeholder Reference Group included:

- Local Members of Parliament
- Network Rail;
- Derby, Derbyshire, Nottingham and Nottinghamshire LEP;
- Greater Manchester LEP;
- Greater Manchester Combined Authority;
- Sheffield City Region;
- South Yorkshire Passenger Transport Executive (SYLTE);
- Transport for Greater Manchester (TfGM);
- Derbyshire County Council;
- Barnsley Metropolitan Borough Council;
- Manchester City Council;
- Rotherham Metropolitan Borough Council;
- Sheffield City Council;
- Stockport Metropolitan Borough Council;

- Tameside Metropolitan Borough Council;
- High Peak Borough Council;
- Peak District National Park Authority;
- National Trust
- Natural England;
- English Heritage;
- Friends of the Earth;
- Campaign to Protect Rural England;
- North West Transport Activists Roundtable;
- Friends of the Peak District;
- Derbyshire Wildlife Trust;
- Greater Manchester Chamber of Commerce;
- Barnsley and Rotherham Chamber of Commerce;
- Sheffield Chamber of Commerce; and,
- Travel Watch North West.

3.2.6 In addition to representation at the Stakeholder Reference Group, specific engagement was undertaken with a number of the stakeholders focussing on four key areas of understanding:

- Confirming that stakeholders recognise the evidence base and identify any gaps;
- Reviewing proposed local transport schemes/programmes and major land use proposals;
- Reviewing policy and previous strategies to ensure local routes are appropriately covered in Stage 1; and,
- Stakeholder views on problems, issues, constraints and opportunities on the trans-Pennine routes.

3.2.7 This secondary engagement included the following stakeholders:

- Network Rail;
- Greater Manchester Combined Authority;

- Sheffield City Region;
- South Yorkshire Passenger Transport Executive (SYLTE);
- Transport for Greater Manchester (TFGM);
- Derbyshire County Council;
- Barnsley Metropolitan Borough Council;
- Manchester City Council;
- Rotherham Metropolitan Borough Council;
- Sheffield City Council; and,
- Tameside Metropolitan Borough Council.

3.3 Timeline of Previous Work

3.3.1 The following table provides a timeline of improvements and studies within the trans-Pennine routes.

Table 3-2 – Trans-Pennine Routes Timeline

Year	Month	Event
1978	-	M67 Hyde Bypass opened
1981	-	M67 Denton Relief Road opened – completing the M67
1987	-	A6 Chapel-en-le-Frith Bypass opened
1989	-	A616 Stocksbridge Bypass opened
1989/90	-	Mottram/Hollingworth/Tintwistle Bypass included in National Roads programme following earlier investigations to provide a bypass
1998	July	New government publishes the results of its own review in "A New Deal for Trunk Roads" and included the bypass as a scheme to be progressed through the preparatory stages
2001	-	DfT South East Manchester Multi Modal Study report is published. This study focussed on South East Manchester and examined problems of congestion on the strategic road network and sought solutions drawn from all modes of transport.
2002	-	DfT South Yorkshire Multi Modal Study report is published. This study focussed on South Yorkshire and examined problems of congestion on the strategic road network and sought solutions drawn from all modes of transport.
2002	November	The Highways Agency submission to the Regional Planning bodies (including North West) concludes that there were no realistic alternatives to a bypass of the villages to solve the problems that exist on A57/A628/A616/A61 route.

Year	Month	Event
2003	April	Mottram to Tintwistle Bypass is entered into the Targeted Programme of Improvements (TPI) - now known as the Programme of Major Schemes
2004	-	The Northern Way publishes its First Growth Strategy Report setting out the vision <i>'Together, we will establish the North of England as an area of exceptional opportunity combining a world-class economy with a superb quality of life'</i> .
2005	-	South Pennine Integrated Transport Study is published. Launched in 1998 by the Peak Park Transport Forum (PPTF) in response to the forecasted growth of traffic flows across the Peak District National Park.
2005	December	Planning consent granted for Glossop Spur (Tameside MBC)
2006	June	North West Regional Assembly presents advice to Ministers and identifies Mottram to Tintwistle Bypass as a priority
2007	-	Secretary of State announces that a study would be undertaken to look at the problems associated with the rail network in the Manchester area, which has been experiencing congestion for a number of years, and potential solutions
2007	June	Public inquiry for both schemes commences and suspended due to problems with HA's evidence. Statement of Case is produced.
2008	-	Mottram to Tintwistle Bypass deferred by 4 years to 2016/17 and Glossop Spur deferred until 2017/18
2009	-	HA recommend that the Secretary of State withdraw from Public Inquiry which is subsequently cancelled. Public Inquiry formally closed
2009	-	Scheme (Mottram to Tintwistle Bypass) removed from HA's programme
2009	-	Northern Hub Rail Phase One study was undertaken, led by The Northern Way, which looked at the potential economic benefits of making improvements to the rail network around Manchester.
2010	-	Tameside MBC lead a study group to develop Longdendale Integrated Transport Study (LITS) currently included in both Greater Manchester Local Transport Plan and the Greater Manchester Transport Fund
2010	-	Northern Hub Rail second phase study was undertaken by Network Rail looking at infrastructure and services.
2011	January	DfT publishes its local transport white paper: Creating Growth, Cutting Carbon – Making Sustainable Local Transport Happen. The local transport White Paper sets out its vision for a local transport network that generates economic growth while reducing carbon emissions.
2011	February	National Network Trans-Pennine Connectivity Study undertaken as part of Delivering a Sustainable Transport

Year	Month	Event
		System (DaSTS)
2011	-	3 rd Local Transport Plans are published for Greater Manchester, Derbyshire and South Yorkshire.
2012	January	The Government announces the decision to progress HS2, with high speed rail links between London, Birmingham, Manchester and Leeds with intermediate stations in South Yorkshire and the East Midlands.
2012	-	Trans-Pennine Connectivity Study (DCC) published. Derbyshire County Council commissioned the Trans-Pennine Connectivity Study to assess the potential economic benefits of improving connectivity between Sheffield and Manchester.
2013	July	HM Treasury publish 'Investing in Britain's Future in which the government announces it will identify and fund solutions (through feasibility studies initially) to tackle some of the most notorious and long-standing road hot spots in the country, including Trans Pennine routes.
2013	-	Manchester City Council successfully submit a bid for Government Pinch Point Funding for a road widening scheme on A57 Hyde Road, Gorton.
2013	-	HA publishes its M62 J18-29 Pilot Route Strategy. The aim of the strategy is stated as 'to facilitate economic growth, continue to manage journey time reliability and safety performance and maintain a resilient asset',
2014	-	HA develops its Route Evidence Report for South Pennines

3.3.2 The Mottram to Tintwistle bypass and the Glossop Spur link to A57 at Woolley Bridge were developed over a number of years with the Glossop Spur element being granted planning permission by Tameside MBC in 2005. The Mottram to Tintwistle Bypass was subsequently called to public enquiry in 2007. Issues with the traffic modelling for the scheme case arose at public inquiry causing several delays in the process. Due to estimated cost increases in delivering the bypass and the Glossop Spur, the schemes were deferred in 2008. In 2009, the schemes were deemed to be prohibitively expensive and were removed from the HA's programme.

3.3.3 As a result of the removal of the bypass scheme from the HA's programme, it was proposed that an integrated transport study (Longdendale Integrated Transport Strategy or LITS) be developed for the Longdendale villages which would identify alternative schemes to the bypass and spur proposals.

3.4 Previous Findings of Studies into Modal Transfer

3.4.1 The most recent work undertaken on the trans-Pennine corridor that included investigation of multi-modal options included both the National Network Trans-Pennine Connectivity Study and LITS.

- 3.4.2 The **National Network Trans-Pennine Connectivity Study (NNTPC)**² was undertaken as part of Delivering a Sustainable Transport System (DaSTS), jointly commissioned by DfT and The Northern Way. It identified the transport challenges for people and freight along routes connecting Manchester, Leeds and Sheffield and considered interventions which may address these challenges.
- 3.4.3 The report acknowledges that the A628 forms the primary route between the city regions of Manchester and Sheffield and highlights the environmental, topographical and climatic challenges for the route. It also states that, given the environmental constraints on routes through the Peak District National Park and that the Mottram to Tintwistle Bypass scheme was withdrawn, this study did not consider a major highways improvement scheme for this route. Instead, it pointed to the study being undertaken by the then Government Office for the North West and Tameside MBC for this specific route (LITS) and focused on the benefits that improved rail links between the cities could benefit the economies of both city regions and the wider north.
- 3.4.4 The report goes on to summarise challenges presented by trans-Pennine highway connections within the study area. The highway challenges identified on the A628 corridor are shown in the table below.

Table 3-3 – NNTPC Study Challenges

Study Challenges (Highways)
Delay and network stress on the M67/A57 and M67/A628/A616 routes affecting connectivity between Manchester and Sheffield City Regions
Limited connectivity leads to low levels of business to business trip making by road between South Yorkshire and Greater Manchester limiting opportunities to increase economic activity
Port connectivity is affected by capacity and capability constraints of rail networks in the study area, limiting potential for rail freight growth due to gauge and path availability issues. This is compounded by limitations to the road offer, due to delay and poor reliability
Current connectivity limitations of the strategic networks in the study area restrict economic interactions and growth across the wider North

- 3.4.5 LITS was highlighted in the third Greater Manchester Local Transport Plan in connection with improving trans-Pennine links. In 2009, the Greater Manchester Transport Fund included a provisional budget of £100m for major transport proposals in Longdendale as an alternative to the Mottram to Tintwistle Bypass/Glossop Spur. In 2010 the Strategy was developed which identified several options for transport interventions aimed at addressing the transport issues experienced in the Longdendale area and a public consultation was undertaken.

² National Networks Trans-Pennine Connectivity Study Phase 1 Report (February 2011), Aecom

3.4.6 Alongside an alternative road scheme to the Mottram-Tintwistle Bypass, a range of public transport measures were identified and included:

- Increased frequency of bus services on selected routes, running throughout the day, seven days a week, between Glossop, Hyde, Ashton-under-Lyne and beyond
- Initiatives to influence travel behaviour and encourage the use of alternatives to driving
- Additional measures to improve bus travel (where appropriate) such as bus lanes; improved bus stops; raised bus access platforms and improved timetable information
- An increase in the frequency of rail services and rail station improvements such as Park and Ride; waiting facilities; bus interchanges; timetable information and attractive pedestrian routes to and from stations

3.4.7 Following the Government's Comprehensive Spending Review in October 2010, LITS was not included in the programme of schemes to be delivered during this Spending Review Period, although the scheme remained an approved priority under GMTF.

4 Availability and Robustness of Transport Modelling

- 4.1.1 Traffic modelling capability is required in order to support the environmental and value for money (VfM) assessment of any proposals. Traffic forecasting will also inform scheme designs and therefore have an influence on scheme costs.
- 4.1.2 The environmental assessment will be largely concerned with changes in traffic flow and how these impact on population. Hence, traffic reassignment is important as are the effects of additional traffic 'induced' by an improvement scheme.
- 4.1.3 The VfM assessment is largely concerned with changes in travel and accident costs and will reflect the relative efficiency or level of service offered by the old and new road networks. Induced traffic is again an important component of the VfM appraisal.
- 4.1.4 Existing models have been examined in the context of the study objective to assess their suitability for the current feasibility study.
- *Mottram-Tintwistle Bypass Study (2009)*
A CONTRAM-based highway model was developed by Consultants Mott MacDonald specifically for the Mottram-Tintwistle bypass study and used up to the Public Inquiry (PI) in 2009. The model base year is 2001 but a present-year update to 2007 was undertaken prior to the PI.
 - *Manchester (M60/M62) Managed Motorway Study*
Developed for the HA Managed Motorways programme, this provides a detailed, conurbation-wide highway model supported by a multi-modal demand model. Realistically, demand modelling is not viable beyond the Greater Manchester boundaries but highway assignment modelling of trans-Pennine routes would provide at least 'indicative' scheme forecasts. The model is based at 2013.
 - *SWAMM (HA M1 Managed Motorway) Study*
Effectively the mirror image of the Manchester model based on South Yorkshire conurbation and with similar capability for strategic option testing.
- 4.1.5 In summary, no purpose-built contemporary transport model exists that is immediately suitable for the comprehensive assessment of trans-Pennine highway improvement options. The development of a suitable, bespoke model would require between 18 to 24 months and incur considerable cost and was considered to be beyond the resources of this study and disproportionate to the main study task.

- 4.1.6 It is however still important that potential consideration of investment proposals is made on the basis of reasonably realistic scheme costs and benefits, even at the feasibility stage. The application of one of the existing models is therefore considered feasible for certain elements of the option assessment. A distinction should be made though between what may be termed 'strategic' or 'local' improvement schemes. The use of one of the existing strategic models may not be appropriate to assess the impact of small scale local improvements and the development of scheme-specific models (for example the use of small junction models) may be a more appropriate approach in some cases.

Strategic Option Forecasts/Assessments

- 4.1.7 Strategic schemes may include proposals such as bypasses or new, high-capacity routes which aim to avoid constraints within the existing trunk road network. The impact of these schemes may be significant with widespread reassignment and the likelihood of induced traffic as a result of reduced travel costs.
- 4.1.8 For other strategic options, a realistic approach would be to utilise the existing Manchester Multi-Modal model to undertake indicative option forecasts. These would illustrate their likely geographical impacts and the scale of network reassignment, hence the subsequent traffic demands on the scheme. These forecasts would be valuable at this feasibility stage and would provide comparative forecasts for candidate schemes.
- 4.1.9 It would not however be feasible to run full demand model forecasts (the model is not calibrated for application for trans-Pennine routes) and induced/redistributional effects will be underestimated. Similarly, user benefits will not be wholly reliable.
- 4.1.10 Instead, fixed demand highway assignments using demand forecasts generated for the M60 Managed Motorway study are possible. These would allow options to be coded in the model network and tested without results potentially being distorted by unrealistic changes in demand arising from the issues raised above. Using a fixed demand assignment allows a benchmark to be established against which different options can be compared on a 'like for like' basis.
- 4.1.11 This approach would provide sufficient information on possible strategic improvement options to allow interpretation of these forecasts for the subsequent economic and environmental appraisals.
- 4.1.12 It was assumed that information on the impact of possible rail improvements, where available, would be provided by Network Rail. Such improvements are not seen as part of the study itself but their impact may be relevant to the assessment of road-based demands on the trans-Pennine routes.

Local Option Forecasts/Assessments

- 4.1.13 Where schemes of a more 'local' nature are identified, scheme-specific local (micro-simulation) models were developed, based on local road geometry and traffic characteristics. Such models are widely used for minor scheme assessment/ traffic management and provide detailed information on travel time changes in response to capacity or operational improvements. Hence, an initial VfM assessment can be undertaken.
- 4.1.14 A more wholesale route improvement strategy combining several local schemes does of course raise the issue of traffic reassignment and redistribution in response to an improved level of service. Such a strategy would ideally be fed back to be tested at a strategic level using the Manchester Multi-Modal model in order to gauge the potential for additional traffic growth following a whole-route upgrade, although this is unlikely to be possible given timeframes and the coarseness of the multi-modal for modelling trans-Pennine trips.

Appraisal

- 4.1.15 Outputs from the option modelling will include changes in traffic flow and travel times, as a basis for the economic and environmental assessments.
- 4.1.16 As noted above, such forecasts will be relatively coarse during this feasibility stage and this is acknowledged in the assessment process.

5 Understanding the Current Situation

5.1 Introduction

- 5.1.1 This section of the report provides a summary of the current situation of the trans-Pennine routes including a commentary of current transport and other policies, current travel demand and level of service, and current opportunities and constraints.

5.2 Routes Description

Strategic Road Network

- 5.2.1 From the west, the HA's route commences at the A57 junction with the M67. The route uses the A57 for 1.3 miles, passing through the village of Mottram until the A57 diverges southwards and the route continues onto the A628 into the village of Hollingworth. The route enters the Peak District National Park immediately east of the village of Tintwistle and uses the A628 for just under 14 miles. The route uses the A616 from its junction with the A628, and leaves the National Park shortly to the east of the junction. The route terminates after 10.6 miles on the A616, at M1 Junction 35A. A short, 1 mile section of the A61, from its junction with the A616 to the M1 Junction 36 is also included as part of the route.
- 5.2.2 The route has been the focus of significant study and scheme development work for the past few decades, not least in the more urban areas at its western end. This feasibility study aims to build on the significant work that has already been undertaken to identify problems and find appropriate solutions.

Local Road Network

- 5.2.3 The A57 becomes non-trunk road following its junction with the A628. The A57, via Snake Pass, provides an alternative trans-Pennine route linking Mottram-in-Longdendale in the west to Sheffield in the east. It passes through Woolley Bridge and Glossop at its western end before traversing the Peak District National Park and running through suburban areas of Sheffield, ultimately joining the A61 Sheffield city centre ring road.
- 5.2.4 As a trans-Pennine route, the A6 commences as a two lane single carriageway in the centre of Stockport and travels south-east through Hazel Grove before reducing to single lanes through High Lane, Disley and to the south of New Mills. It then bypasses Chinley and Chapel-en-le-Frith, before its junction with the A623. The bypass is dual-carriageway for the majority of its length but reduces to single carriageway two lane southbound/one lane northbound to the east of Chapel-en-le-Frith.
- 5.2.5 The A623 is a rural single carriageway and passes through the Peak District National Park for the entire section of relevance to this study. The road connects the A6 to the A625, passing through a number of small settlements.

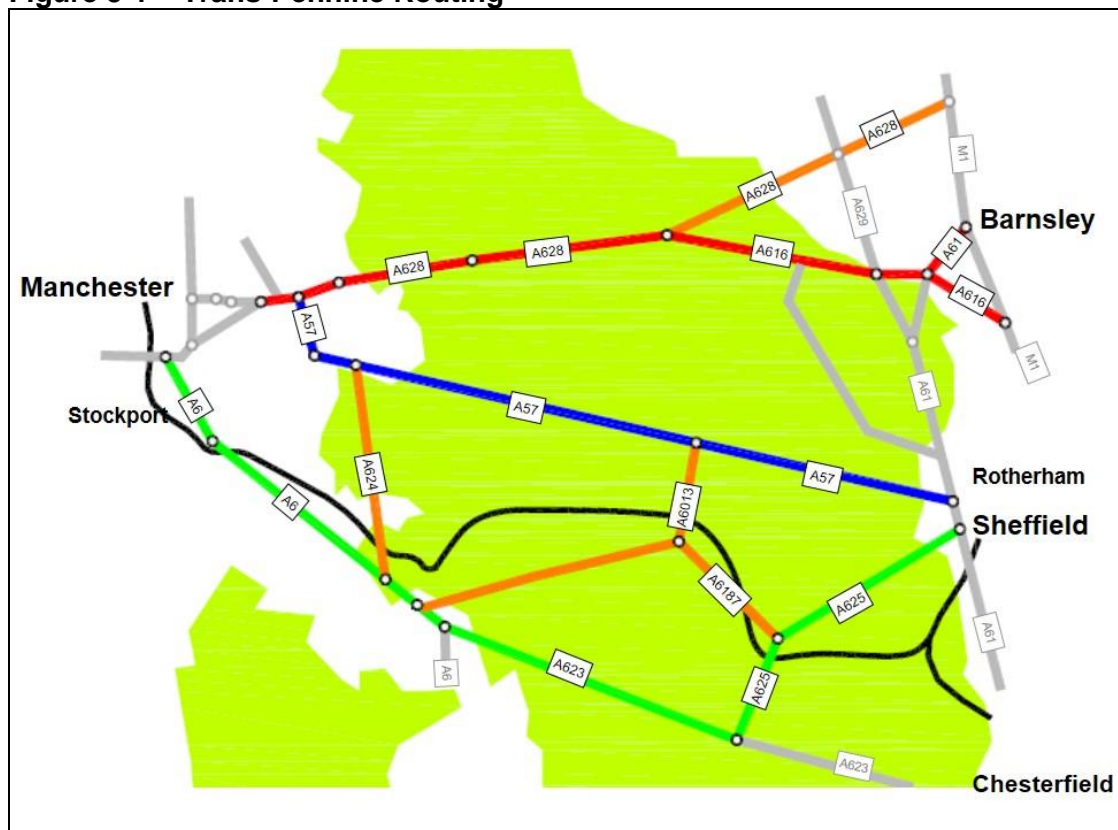
- 5.2.6 The A624 is a rural single carriageway that connects the A6 at Chapel-en-le-Frith to the A57 at Glossop. The route passes through the village of Hayfield and passes through the urban area of Glossop before joining the A57 in the centre of the town. The road passes through the Peak District National Park for the majority of its route, entering to the north of Chapel-en-le-Frith and leaving before it enters Glossop, with a short section outside of the Peak District National Park around Hayfield.
- 5.2.7 A625 is primarily a rural single carriageway that links the A623 at the village of Calver with Sheffield. It travels through the Peak District National Park until it reaches the suburbs of Sheffield and becomes a two lane single carriageway, with some bus lane provision as it gets closer to the city centre, where it has a junction with the A61 ring road.
- 5.2.8 The non-trunk continuation of A628, east of the junction with the A616, connects to M1 at J37 and Barnsley. It is predominantly a rural single carriageway and also passes through Penistone.
- 5.2.9 A6187 is a rural single carriageway connecting the A625 to Castleton, passing through Hathersage on route. The A6187 becomes a 'B' road to the west of the town and has a 7.5t weight restriction on Winnats Road/Arthurs Way. This route joins the A6 to the west of Chapel-en-le-Frith.
- 5.2.10 A6013 links the A6187 with the A57 to the east of Ladybower Reservoir and is a rural single carriageway.

Trans-Pennine Routing

- 5.2.11 The choice of road routes across the Pennines between Manchester and Sheffield will primarily be one of the following three:
- **The Northern Route:** From the west of the Manchester conurbation and the M67, following the A57, A628 and A616 trunk road route before travelling south into Sheffield via the A629/A61 (shown in red on Figure 5-1);
 - **The Central Route:** From the west of the Manchester conurbation and the M67, following the A57 and non-trunk A57 into the centre of Sheffield from the west (Shown in blue in Figure 5-1); and,
 - **The Southern Route:** From Stockport, the A6, A623 and A625 into Sheffield from the southwest (shown in green in Figure 5-1).

- 5.2.12 A variation to the Central Route would be to leave the A57 on the A6013, onto A6187 and into Sheffield via the A625. However, this alternative route is longer and meets the A61 in Sheffield city centre less than a mile from where the A57 meets it.
- 5.2.13 Due to the nature of the road, and the weight restriction, it appears unlikely that significant strategic traffic will use the A6187 between its junction with the A6103 and the A6.

Figure 5-1 – Trans-Pennine Routing



Railway

- 5.2.14 The main railway link between Manchester and Sheffield is the Hope Valley Line. This line is served by three services:
- Manchester Airport to Cleethorpes – Trans-Pennine Express;
 - Liverpool to Norwich – East Midlands Trains; and,
 - Manchester to Sheffield – Northern.

5.3 Trans-Pennine Journeys

- 5.3.1 Journey distances between Manchester and Sheffield using the three alternative road routes are shown below with the non-trunk route via the A57 being the shortest and the route via the A6, A623 and A625 the longest:

- Manchester to Sheffield (via A57/A628/A616) – 41.0 miles;
- Manchester to Sheffield (via A57) – 38.2 miles; and,
- Manchester to Sheffield (via A6/A623/A625) – 45.2 miles.

5.3.2 Indicative journey times for the above routes are shown in the following table and demonstrate that while the non-trunk route via the A57 may be the shortest by distance, it provides marginally longer journey times than the trunk route via the A57, A628 and A616. The data also shows a significant difference between off-peak and peak period journey times with journeys approximately 40 minutes longer eastbound and 30 minutes westbound during peak periods.

Table 5-1 – Indicative Journey Times by Road between Manchester and Sheffield

Current Conditions	Eastbound (hh:mm)		Westbound (hh:mm)	
	Off-Peak	Peak	Off-Peak	Peak
Via A57/A628/A616	01:13	01:51	01:13	01:43
Via A57	01:14	01:52	01:15	01:45
Via A6/A623/A625	01:33	02:13	01:28	01:57

Source: Google Maps Journey Planner (May 2014)

Peak period road journey times between Manchester and Sheffield are 30 to 40 minutes longer than off-peak journeys.

5.3.3 In comparison to the road journey times, of the three rail services, the Manchester Airport to Cleethorpes and Liverpool to Norwich are hourly fast express services, stopping only at Stockport between Manchester and Sheffield and provide journey times between the two cities of between 48 and 60 minutes. The Manchester to Sheffield service is a slower, stopping service calling at Reddish North, Brinnington, Bredbury, Romiley, Marple, New Mills Central, Chinley, Edale, Hope, Bamford, Hathersage, Grindleford and Dore & Topley and journey times are between 1hr 17mins and 1hr 21mins. This slower service operates hourly during peak periods but two-hourly in the off-peak. The three services operate at these frequencies during weekdays and on Saturdays but there is a reduced service on early Sunday mornings and then a mixture of two or three trains per hour until the late evening.

Some journeys by rail between Manchester and Sheffield can be quicker than by road in the off-peak periods and substantially quicker in peak periods.

5.3.4 In addition to passenger trains, the Hope Valley Line also caters for freight with up to one train every two hours.

- 5.3.5 The National Networks Trans-Pennine Connectivity Study (NNTPCS) Phase 1 Report provided a commentary on the strength of travel links between the Greater Manchester, West Yorkshire and South Yorkshire conurbations.
- 5.3.6 The NNTPCS Report reviewed travel patterns between the three conurbations for business travel and freight movements. This was assessed through a review of inter-peak journeys between the three conurbations using a combination of data from the Greater Manchester (GM) SATURN and South and West Yorkshire Making Best Use Study (SWYMBUS). Whilst using historical data, the GM SATURN model used was validated to a base year of 2008, whereas the SWYMBUS data was validated to 2006, it continues to give a basic understanding of travel patterns.
- 5.3.7 The following table presents information on inter-peak hour road-based business trips between the Greater Manchester, South Yorkshire and West Yorkshire conurbations. The table also shows 'other' destinations from the three conurbations and total inter-peak hourly movements. The table indicates that there are presently comparatively few road-based business trips from Greater Manchester to Sheffield (2%) and more in the opposite direction (7%). The table also shows that the linkages between the two conurbations and West Yorkshire are significantly stronger in terms of business trips.

Table 5-2 – Trans-Pennine Inter-Peak Hour Highway Business Trips

Origin	Destination				Total
	Greater Manchester	South Yorkshire	West Yorkshire	Other	
G. Manchester	-	2% (78)	12% (533)	86% (3,899)	4,511
S. Yorkshire	7% (126)	-	32% (604)	61% (1,157)	1,887
W. Yorkshire	15% (399)	26% (669)	-	59% (1,548)	2,615

National Networks Trans-Pennine Connectivity Study Phase 1 Report

- 5.3.8 The following table presents information on inter-peak hour road-based freight trips between the Greater Manchester, South Yorkshire and West Yorkshire conurbations. The table again indicates weaker links between Greater Manchester and South Yorkshire, particularly in the eastbound direction, with only 1% of movements from Greater Manchester.

Table 5-3 – Trans-Pennine Inter-Peak Hour Highway Freight Trips

Origin	Destination				Total
	Greater Manchester	South Yorkshire	West Yorkshire	Other	
G. Manchester	-	1% (47)	10% (492)	89% (4,219)	4,758
S. Yorkshire	8% (165)	-	32% (691)	60% (1,278)	2,135
W. Yorkshire	14% (305)	19% (398)	-	67% (1,431)	2,133

National Networks Trans-Pennine Connectivity Study Phase 1 Report

Analysis of business and freight journeys reveals that connections between Greater Manchester and South Yorkshire are weaker in comparison to links between those conurbations and West Yorkshire.

- 5.3.9 The NNTPCS also referenced a study³ commissioned by the Northern Way which concluded that the east-west commuting links across the North of England were significantly weaker than those in the north-south direction, and particularly to London. The report highlighted that barriers to physical movement, such as time of travel, may be the reason for the limited linkages between the northern cities and restricts growth. The study identified a lack of commuting between Manchester and Sheffield and that this suggests that the two cities do not have overlapping labour markets. The report states that *‘Labour markets which are so largely confined to metropolitan areas and their immediate local surroundings are likely to result in patterns of economic activity that are sub-optimal, although there are potential environmental sustainability advantages’*.
- 5.3.10 Analysis of 2011 Census Travel to Work Data, presented in the following tables, shows a significant variation in the strength of employment links between Greater Manchester, West Yorkshire and South Yorkshire. The strongest links between the three are between the two Yorkshire metropolitan areas with a total of over 41,500 commuting trips made between the two areas. This compares to a total of 20,600 between Greater Manchester and West Yorkshire and only 5,000 between Greater Manchester and South Yorkshire.
- 5.3.11 Of those commuting between Greater Manchester and South Yorkshire, 71% (3,600) travel by car and 12% (600) travel by train.

Table 5-4 – Daily Commuters between Metropolitan Areas – All Journeys

Metropolitan Area	Greater Manchester	South Yorkshire	West Yorkshire
Greater Manchester	904,361 (41.4%)	1,374 (0.1%)	8,916 (0.4%)
South Yorkshire	3,677 (0.1%)	426,951 (19.6%)	26,420 (0.2%)
West Yorkshire	11,692 (0.5%)	15,116 (0.7%)	783,428 (35.9%)
Note: Percentages are for all journeys either within or between the three cities			
Source: 2011 Census Travel to Work Data			

³ Centre for Urban Policy Studies, University of Manchester Institute for Political and Economic Governance, Coates, D. (2008) “Connecting the North: interdependence an barriers: rail, road, air and maritime links”, published by the Northern Way

Table 5-5 – Daily Commuters between Metropolitan Areas – Commuters by Car and Car Mode share

Metropolitan Area	Greater Manchester	South Yorkshire	West Yorkshire
Greater Manchester	600,243 (66%)	1,008 (73%)	7,181 (81%)
South Yorkshire	2,602 (71%)	290,756 (68%)	23,240 (88%)
West Yorkshire	9,122 (78%)	13,458 (89%)	536,612 (68%)

Source: 2011 Census Travel to Work Data

Table 5-6 – Daily Commuters between Metropolitan Areas – Commuters by Train and Train Mode share

Metropolitan Area	Greater Manchester	South Yorkshire	West Yorkshire
Greater Manchester	21,907 (2%)	217 (16%)	806 (9%)
South Yorkshire	374 (10%)	5,560 (1%)	1,556 (6%)
West Yorkshire	1,527 (13%)	706 (5%)	27,352 (3%)

Source: 2011 Census Travel to Work Data

5.3.12 The following tables present the commuting journeys between the Manchester, Leeds and Sheffield metropolitan boroughs. Total journeys between the three cities amount to 3,600 between Leeds and Sheffield, 1,250 between Manchester and Leeds and only 760 between Manchester and Sheffield. Of the journeys between Manchester and Sheffield, 46% are made by car and 41% by train. This does show that, while total commuting journeys by car and train between Manchester and Sheffield are relatively few, less than 0.2% of all journeys either between or within the three cities, the modal share between road and rail for such journeys are similar. This should also be contrasted with the mode share of journeys between Greater Manchester and South Yorkshire with car being the dominant mode at 71% to the rail mode share of 12%.

Table 5-7 – Daily Commuters between Metropolitan Boroughs – All Journeys

Borough	Manchester	Leeds	Sheffield
Manchester	108,658 (21.2%)	530 (0.1%)	236 (0.0%)
Leeds	718 (0.1%)	236,326 (46.2%)	1,154 (0.2%)
Sheffield	527 (0.1%)	2,477 (0.5%)	161,004 (31.5%)

Note: Percentages are for all journeys either within or between the three cities
 Source: 2011 Census Travel to Work Data

Table 5-8 – Daily Commuters between Metropolitan Boroughs – Commuters by Car and Car Mode share

Borough	Manchester	Leeds	Sheffield
Manchester	43,744 (42%)	274 (52%)	122 (52%)
Leeds	388 (54%)	140,633 (60%)	916 (79%)
Sheffield	228 (43%)	1,821 (74%)	91,894 (57%)

Source: 2011 Census Travel to Work Data

Table 5-9 – Daily Commuters between Metropolitan Boroughs – Commuters by Train and Train Mode share

Borough	Manchester	Leeds	Sheffield
Manchester	1,762 (2%)	152 (29%)	75 (32%)
Leeds	227 (32%)	6,040 (3%)	149 (13%)
Sheffield	236 (45%)	406 (16%)	1,135 (1%)

Source: 2011 Census Travel to Work Data

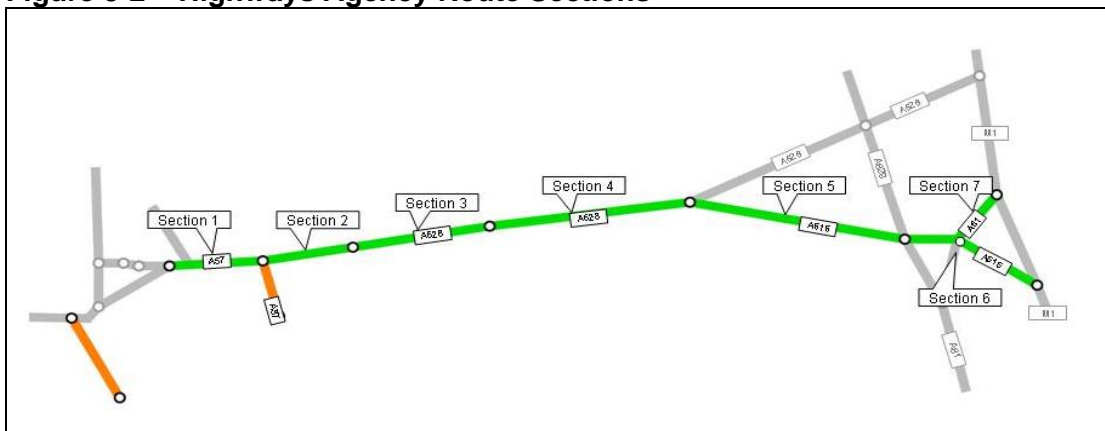
Journey data on business travel and freight indicates that the transport links between Greater Manchester and South Yorkshire compare less favourably than their respective links with West Yorkshire.

The level of commuting between Manchester and Sheffield is small compared to the levels of commuting between the two cities and Leeds. However, the modal share between road and rail is generally similar, unlike the respective share of journeys between Manchester/Sheffield and Leeds.

5.4 Traffic Flow Data

- 5.4.1 Traffic flows have been analysed across the highway network on the trans-Pennine routes. The flows on the HA's Strategic Road Network have been analysed in more detail and to aid this analysis, the A57/A628/A616/A61 route has been split into seven sections; this was based on the split between the roads themselves and the varying urban and rural nature of individual roads. The split of the route sections is presented in Figure 5-2 below.

Figure 5-2 – Highways Agency Route Sections



Annual Average Daily Traffic flow (AADT) with the number of Heavy Goods Vehicles (HGVs) shown in brackets are presented in Figure 5-3 below for all the trans-Pennine route sections.

Section/Route	AADT No. vehicles (HGV %)			Year
	Eastbound	Westbound	2-Way	
Source: HA TRADS Database				

- 5.4.3 Section 1, covering the A57, is the busiest of the seven sections, with a two-way AADT of 36,638 and AAWT of 38,274. The survey site is positioned on the A57 to the east of the A6018 junction and the data will therefore include traffic travelling to/from the A6018 in addition to traffic travelling to/from the A57/M67/A560 roundabout. Section 7 and to a lesser extent Section 6 are also busier sections, but traffic flows decrease significantly in Section 2 and within the High Peak area. It can be concluded that traffic flows are therefore higher at the two ends of the trunk route, in closest proximity to the motorway links.
- 5.4.4 HGV proportions are broadly similar in both eastbound and westbound directions. The highest proportions of HGVs are found in the High Peak area. HGV proportions are lower in Sections 1 and 7, at the two ends of the trunk route, due to the overall heavier traffic flows in these sections.
- 5.4.5 In terms of the other trans-Pennine routes, the M62 and A50 experience significantly higher flows. Flows on the A66 and A69 are comparable to those experienced in Sections 2 to 5 of the study route. HGV proportions on the other trans-Pennine routes are broadly similar to the study route, with the exception of the A66, which has a larger proportion of HGVs.

Traffic flows on the central sections of the HA's Trans-Pennine route, along with the A66 and A69, are substantially lower than those on the M62.

HGV percentages on the HA's Trans-Pennine route are comparable to other Trans-Pennine routes with the exception of the A66.

- 5.4.6 The following table presents a summary of peak hour traffic flows for the average of all weekdays.

Table 5-11 – Summary of Traffic Flows: Ave. Weekday (Mon-Fri)

Section	AM Peak (vph)			Inter-Peak (vph)			PM Peak (vph)			Off-Peak (vph)		
	EB	WB	2-Way	EB	WB	2-Way	EB	WB	2-Way	EB	WB	2-Way
1 – A57	1,341	1,125	2,467	1,156	1,165	2,322	1,226	1,524	2,750	398	411	809
2 – A628	528	426	954	523	445	968	608	468	1,076	166	165	331
3 – A628	504	427	931	444	428	872	452	500	952	141	147	288
4 – A628	523	450	973	454	444	898	486	495	981	138	158	295
5 – A616	603	485	1,088	496	488	984	543	588	1,130	148	168	315
6 – A616	899	606	1,504	642	647	1,288	630	673	1,303	181	198	380

Section	AM Peak (vph)			Inter-Peak (vph)			PM Peak (vph)			Off-Peak (vph)		
	7 – A61	992	768	1,760	725	674	1,399	888	1,014	1,902	222	211

Source: HA TRADS Database

- 5.4.7 In terms of the daily profile of traffic flows, with the exception of Section 6, the PM peak traffic flows are greater than other periods.
- 5.4.8 In Section 1, the heavier eastbound flow experienced in the AM peak period and the heavier westbound flow in the PM peak period suggest some tidality of traffic away from Manchester in the AM peak and towards Manchester in the PM peak. This tidality is less apparent in Section 2, with higher eastbound flows in both the AM and PM peak periods. This suggests that some of this tidal traffic leaves the trunk route prior to Section 2.
- 5.4.9 Minor tidality in traffic flows is apparent in Sections 3 to 6, with eastbound flows higher than westbound flows in the AM peak period but westbound flows only very slightly higher than eastbound flows in the PM peak period. In Section 7, tidality is more evident, with higher eastbound flows towards the M1 in the AM peak and higher westbound flows away from the M1 in the PM peak.
- 5.4.10 In terms of traffic on the local authority roads, the following table presents the AADT information and these are also shown in Figure 5-3.

Table 5-12 – Summary of Minimum AADT Flows on Local Authority Roads

Road	Minimum AADT Between Manchester and Sheffield
A57	4,082
A6	10,115
A623	6,367
A624	6,651
A625	2,618
A6187	5,111
A6013	5,126

Source: DfT

With the exception of the A6, the HA's Trans-Pennine route supports significantly higher traffic flows (minimum 12,350 AADT) than the comparable local authority routes (between 2,600 and 6,650).

5.4.11 Further analysis of the above traffic flow data indicates that a relatively small proportion of journeys on the A57/A628/A616/A61 are end-to-end trans-Pennine journeys along the entire length of the HA's route. The busiest section on the HA's route is the A57, which has an AADT flow of 36,600, while the A628 has the lowest flow of 12,400. If it was assumed that all those journeys on A628 were end-to-end, it could be assumed that a maximum of one third of journeys on the busiest section of the HA's route, the A57, were end-to-end journeys (i.e. 12,400 of the 36,600 maximum flow). In reality, however, it is unlikely that all journeys on the A628 will be end-to-end due to the significant potential for the route to be used as part of shorter, non-trans-Pennine journeys.

Less than one third of journeys on the busiest section of the HA's trans-Pennine route are end-to-end journeys.

5.4.12 However, the trunk road section of the A57 also takes traffic from the non-trunk A57, which provides an alternative and more direct route between Manchester and Sheffield. The lowest AADT on the A57 between the two cities is 4,000; this would indicate that, when combined with the lowest flow on the A628, no more than 16,400 vehicles make trans-Pennine movements via the trunk road section of the A57 each day and, in reality, this flow will be less.

5.4.13 Furthermore, if a screenline of traffic counts is assumed, using the AADT minimum flows on the A628, A57 and A625 to provide a maximum trans-Pennine movement per day, a total flow of 19,000 vehicles is identified. This reveals a number of points:

- The Northern Route (A57/A628/A616) is the predominant route for trans-Pennine movements, with a minimum of 12,400 vehicles making such journeys per day;
- The Central Route (A57) is the second most used route, with a maximum of 4,000 vehicles making trans-Pennine journeys per day; and,
- The Southern Route (A6/A623/A625) is least used route between Manchester and Sheffield with less than 2,600 journeys per day. Furthermore, the A625 will also be used by traffic between Sheffield and Bakewell, Buxton, Cheshire and North Staffordshire, therefore the traffic between Manchester and Sheffield is likely to be significantly lower.

5.4.14 The above figures compare to the lowest AADT flow on the M62 between Manchester and Leeds of 87,000 and a rail movement of approximately 3,700 journeys per day between Manchester and Sheffield city centres (see below). It should be highlighted that the 87,000 flow will comprise of a wider number of movements than purely Manchester to Leeds.

- 5.4.15 Stakeholder comments highlighted in the South Pennines Route Strategy Evidence Report state that on the A628 there are ‘*conflicts between longer distance and short commuter trips*’ and that ‘*the route serves a variety of functions adding to delay, congestion and journey time reliability*’. Due to the close proximity and interaction of the A628 to the A57 and these same issues can also be applied to the A57.

Railways

- 5.4.16 The Hope Valley Line carries over 1.5 million passengers annually for journeys between Manchester and Sheffield stations and the intermediate calling points. This equates to approximately 5,000 journeys per day. Outward journeys are higher towards Sheffield, however, journeys between the two centres themselves are very similar.

Table 5-13 – Summary of Passenger Journeys on Hope Valley Line

Railway Station	Total Journeys into Manchester	Total Journeys into Sheffield	Total Journeys to and from Station (ORR station usage 2011/12)	Daily Journeys into Manchester *	Daily Journeys into Sheffield*
Manchester	-	574,000	39,900,000	-	1,840
Stockport	Unknown	103,000	3,313,000	-	330
Hazel Grove	Unknown	1,000	610,000	-	3
Chinley	57,000	13,000	103,000	183	42
Edale	16,000	20,000	73,000	51	64
Hope	13,000	15,000	52,000	42	48
Bamford	6,000	10,000	25,000	19	32
Hathersage	9,000	24,000	56,000	29	77
Grindleford	13,000	24,000	55,000	42	77
Dore	32,000	36,000	106,000	103	115
Sheffield	583,000	-	8,424,000	1,869	-
Total	729,000	820,000		2,337	2,628
* based on 6 days per week					
Source: Long Term Planning Process: Regional Urban Market Study (Network Rail, October 2013)					

There are approximately 5,000 rail journeys per day on the Hope Valley railway line including 3,700 journeys between Manchester and Sheffield city centres.

- 5.4.17 Network Rail has stated that, broadly, the operators providing the fast services, East Midlands Trains and First Trans-Pennine Express, carry 50% and 20% of the passengers respectively, with the slow service operated by Northern accounting for the remaining 30% of passengers.
- 5.4.18 The Long Term Planning Process: Regional Urban Market Study (Network Rail, October 2013) states that ‘the market on this route is driven by some commuting into Sheffield and Manchester and leisure trips to and from the Peak District National Park.’ The report also states that in ‘terms of the market share for rail in this area, this is described as being relatively small into Sheffield, with potential gains to be made, due to the road route between Manchester and Sheffield offering poor journey times and being unreliable in bad weather’.
- 5.4.19 The Hope Valley Line has been subject to crowding for boarding at both Manchester and Sheffield in the peak and shoulder peak periods due to the operation of only one peak fast service. However, since December 2011, a second hourly fast service has been introduced which will have somewhat reduced crowding but overcrowding remains an issue on the route, particularly at the two ends.
- 5.4.20 The key freight flows on the hope valley line are related to:
- Aggregates: Peak Forest – Greater Manchester / Yorkshire / SE Terminals / London Terminals. Typical destinations include Elstree, Radlett, St. Pancras;
 - Limestone: Peak Forest – Aire Valley Power Stations (Drax / Eggborough) and Peak Forest to Nottinghamshire Power Stations (Cottam, West Burton, Radlett) and Peak Forest to Fiddlers Ferry;
 - Cement: Earles / Tunstead to Theale / Seaham / Dewsbury;
 - Waste: Manchester to Roxby Gullet (Scunthorpe); and,
 - Potential biomass traffic Liverpool Docks to Aire Valley Power Stations.

5.5 Route Capacity

Congestion Reference Flows (CRF), essentially a measure of the capacity of highway sections expressed as a percentage, have been calculated for each road route section. Sections 3 and 4 appear to have the largest levels of available capacity, with the calculations suggesting that these links are currently operating at around 40% of capacity while Section 7 is the closest to reaching capacity at existing traffic levels, operating at around 75%. CRFs are presented in Figure 5-4.

Figure 5-4 – Congestion Reference Flows – Existing Traffic Flows

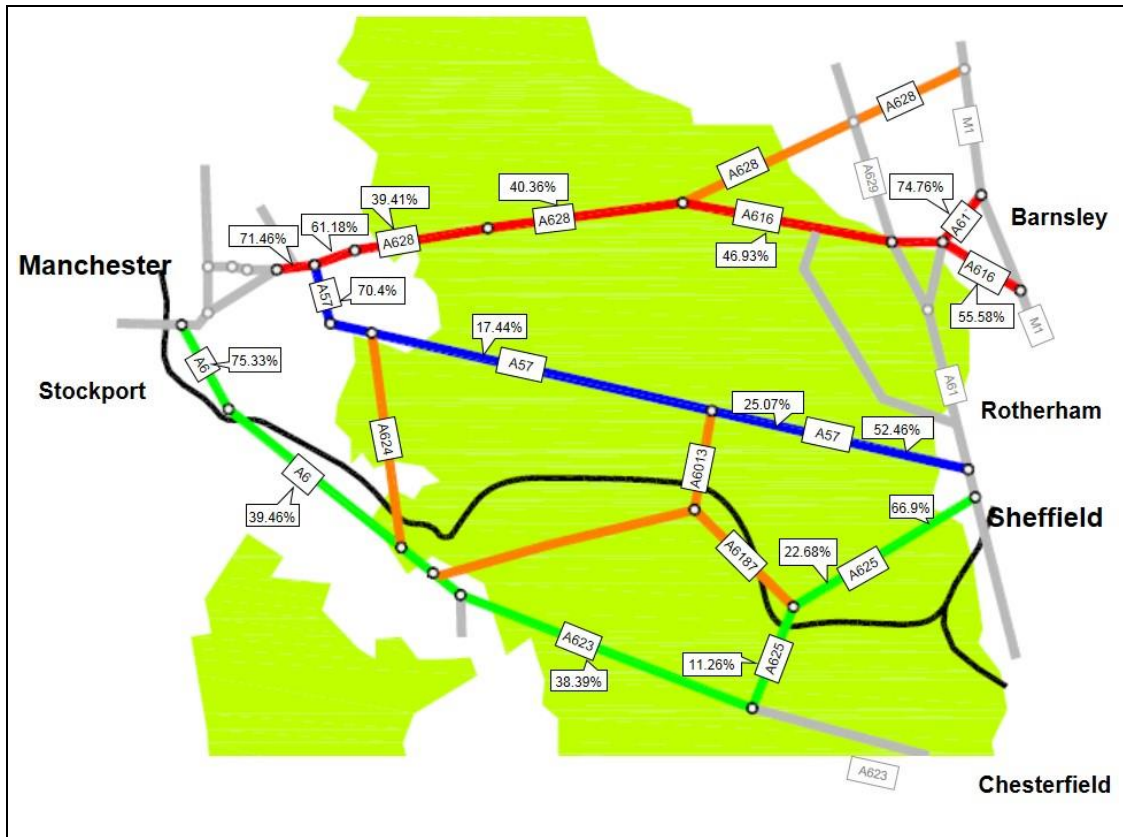


Table 5-14 – Congestion Reference Flows by Section – Existing

Section	Existing Traffic Flows
1) A57 between M67 J4/A57/A560 roundabout and A57/A628 junction in Hollingworth	71.46%
2) A628 between A57/A628 junction in Hollingworth and end of Tintwistle 30mph section	61.18%
3) A628 between end of Tintwistle 30mph section and A628/A6024 junction	39.41%
4) A628 between A628 / A6024 junction and A628 / A616 junction	40.36%
5) A616 between A628 / A616 junction and A616 / A629 junction	46.93%
6) A616 between A616 / A629 junction and A616 / M1 J35A	55.58%
7) A61 between A61 / A616 junction and A61 / M1 J36	74.76%

5.5.1 During peak periods, Section 3 appears to have the greatest level of available capacity, operating at less than 40% of capacity. Section 7 is the closest to reaching capacity, though it is still operating at less than 75% capacity. Sections 1 and 2 are operating at 71% and 61% of capacity respectively.

On the HA's route, the A61 and A57 are closest to reaching link capacity, however, all sections are currently operating at below 75% of capacity.

- 5.5.2 CRF values have been calculated for a number of locations on local highway authority routes which are shown in the following table and these links are currently operating with a maximum capacity at around 75%.

Table 5-15 – Congestion Reference Flows on Local Authority Roads

Section	Current
A57 between the A628 and Glossop	70.40%
A57 between Glossop and A6013	17.44%
A57 between A6013 and A6101	25.07%
A57 between A6101 and Sheffield	52.46%
A6 between Stockport and A523	75.53%
A6 between Chapel-en-le-firth and A623	39.46%
A623 between the A6 and A625	38.39%
A625 between the A623 and A6187	11.26%
A625 between the A6187 and Dore	22.68%
A625 between Dore and Sheffield	66.90%

- 5.5.3 During peak periods, the A57 through Glossop and the A6 near Stockport appear to have the least level of available capacity, and are operating at between 25% and 30% spare capacity.

Of the local authority roads, the A6 and A57 provide the least levels of available capacity.

5.6 Congestion and Speed

- 5.6.1 Analysis of AM and PM peak hour journey times has been undertaken using Trafficmaster data for the HA's trans-Pennine route comprising the A57, A628, A616 and A61. Average journey times for weekday AM (08:00-09:00) and PM (17:00-18:00) peak hours have been calculated for the entire route, and for individual route sections, for both directions.
- 5.6.2 The following four tables present the outputs of this analysis.

Table 5-16 – M67/A57 Roundabout to M1 Junction 35a: AM Peak Eastbound Journey Time Summary

Time Period	Journey Time by Section (mm:ss)					
	1 (1.34 miles)	2+3 (6.42 miles)	4 (7.38 miles)	5 (7.58 miles)	6 (3.05 miles)	Total Journey Time
2013 Baseline (00:00 - 02:00)	02:34	09:28	09:38	09:05	03:34	34:19
AM Peak (08:00 - 09:00)	06:13	10:54	12:10	09:50	08:45	47:52
Peak as % of Baseline	242%	115%	126%	108%	246%	140%
Cumulative Journey Time	06:13	17:07	29:16	39:07	47:52	47:52
Source: Trafficmaster						

Table 5-17 – M67/A57 Roundabout to M1 Junction 35a: PM Peak Eastbound Journey Time Summary

Time Period	Journey Time by Section (mm:ss)					
	1 (1.34 miles)	2+3 (6.42 miles)	4 (7.38 miles)	5 (7.58 miles)	6 (3.05 miles)	Total Journey Time
2013 Baseline (00:00 - 02:00)	02:34	09:28	09:38	09:05	03:34	34:19
PM Peak (17:00 - 18:00)	07:45	10:24	12:32	09:48	04:25	44:54
Peak as % of Baseline	301%	110%	130%	108%	124%	131%
Cumulative Journey Time	07:45	18:09	30:41	40:29	44:54	44:54
Source: Trafficmaster						

Table 5-18 – M1 Junction 35a to M67/A57 Roundabout: AM Peak Westbound Journey Time Summary

Time Period	Journey Time by Section (mm:ss)					
	6 (3.05 miles)	5 (7.58 miles)	4 (7.38 miles)	3+2 (6.42 miles)	1 (1.34 miles)	Total Journey Time
2013 Baseline (00:00 - 02:00)	03:54	09:23	09:21	10:00	02:38	35:16
AM Peak (08:00 - 09:00)	04:20	10:01	10:48	14:12	05:01	44:22
Peak as % of Baseline	111%	107%	116%	142%	190%	126%
Cumulative Journey Time	04:20	14:21	25:09	39:21	44:22	44:22
Source: Trafficmaster						

Table 5-19 – M1 Junction 35a to M67/A57 Roundabout: PM Peak Westbound Journey Time Summary

Time Period	Journey Time by Section (mm:ss)					
	6 (3.05 miles)	5 (7.58 miles)	4 (7.38 miles)	3+2 (6.42 miles)	1 (1.34 miles)	Total Journey Time
2013 Baseline (00:00 - 02:00)	03:54	09:23	09:21	10:00	02:38	35:16
PM Peak (17:00 - 18:00)	10:59	09:43	10:22	13:15	05:04	49:23
Peak as % of Baseline	281%	103%	111%	133%	192%	140%
Cumulative Journey Time	10:59	20:42	31:04	44:18	49:23	49:23
Source: Trafficmaster						

Peak hour journeys on the HA's route are between 126% and 140% of the baseline (free flow) journey time – adding up to 14 minutes to the journey

The sections at either end of the HA's route suffer from proportionately great journey delays

Vehicle Speeds

5.6.3 Analysis was undertaken of the Trafficmaster data to assess average speeds on the HA's route. Figures 5-5 and 5-6 below present the average AM and PM peak hour speeds respectively.

Figure 5-5 – Average AM Peak Hour Vehicle Speeds

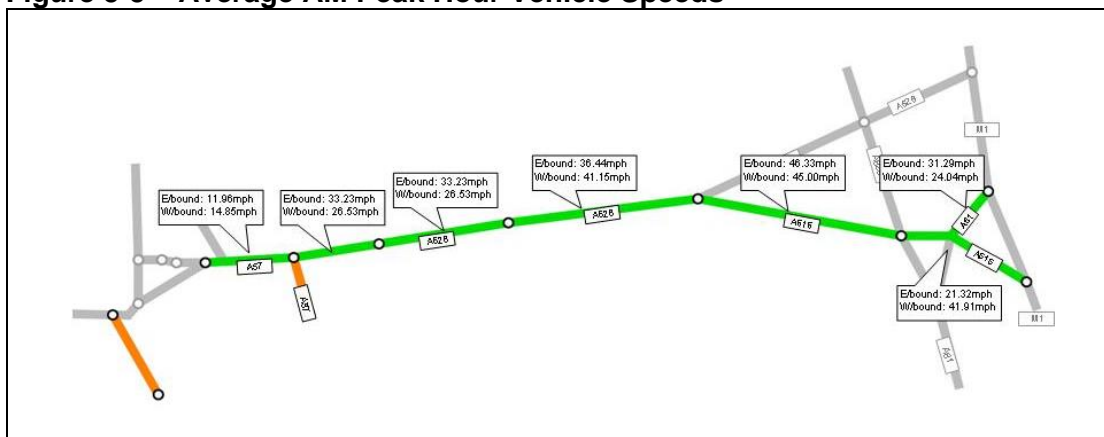
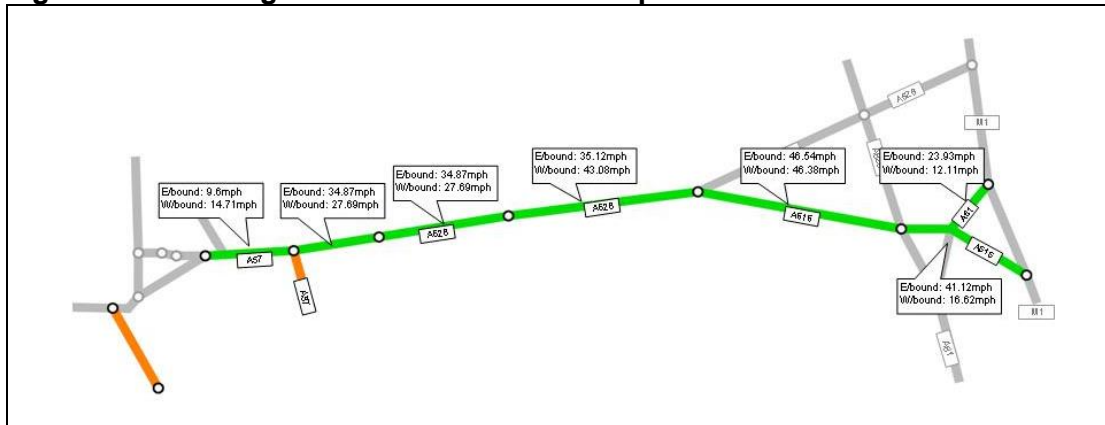


Figure 5-6 – Average PM Peak Hour Vehicle Speeds



5.6.4 The following table shows average peak hour speeds for the route in the eastbound direction. As can be seen, the average speed in Section 1, the A57 through Mottram, drops significantly in the peak hours compared to the free flow conditions of the 00:00 to 02:00 baseline. The speed drops to below 10mph in the PM peak hour and is below 12mph in the AM peak hour. The speeds in Section 6 also drop significantly, particularly in the AM peak hour there it drops to 21mph compared to the 50mph free flow. In Section 7, the PM peak speeds are particularly low in the eastbound direction. All other sections also show decreases in average speed in the peak hours, some considerable.

Table 5-20 – Eastbound Average Vehicle Speeds (mph)

Period	Section 1	Section 2&3	Section 4	Section 5	Section 6	Section 7
2013 Baseline (00:00–02:00)	31.65	40.69	46.02	52.02	50.12	44.79
AM Peak (08:00–09:00)	11.96	33.23	36.44	46.33	21.32	31.29
PM Peak (17:00–18:00)	9.6	34.87	35.12	46.54	41.12	23.93

Source: Trafficmaster

5.6.5 In the westbound direction, Section 1 shows another significant drop in average speed, but not quite as severe as the eastbound direction. Section 2 and 3 however, show lower speeds than in the eastbound direction. Section 4 has slightly higher speeds in the westbound direction while Section 5 speeds do not significantly vary between directions. Section 6 appears to reveal some tidality as eastbound flows are low in the AM peak but westbound speeds are low in the PM peak. The speeds in Section 7 in the PM peak are the slowest on the HA's route of 12.1mph.

Table 5-21 – Westbound Average Vehicle Speeds (mph)

Period	Section 7	Section 6	Section 5	Section 4	Section 2&3	Section 1
2013 Baseline (00:00–02:00)	45.93	47.31	50.24	47.55	38.61	31.21
AM Peak (08:00–09:00)	24.04	41.91	45.00	41.15	26.53	14.85
PM Peak (17:00–18:00)	12.11	16.62	46.38	43.08	27.69	14.71
Source: Trafficmaster						

- 5.6.6 Overall, the speed analysis shows significant congestion in Sections 1, 6 and 7. Furthermore, the information also shows that in some of the more lightly trafficked sections, speeds are significantly below the speed limits, potentially indicating traffic is slowed by causes other than congestion, such as vertical and horizontal alignments.

Analysis of traffic speed data has identified significant congestion on the A57(T), A61 and eastern end of the A616.

- 5.6.7 It should be noted that additional monitoring work undertaken in 2013 at the western end of the route by the HA’s Managing Agent Contractor has identified significantly larger delays. Surveys undertaken for journey times on the A57, from the start of queues waiting to access the A57 from the M67, A628 or non-trunk A57, can be upwards of 40 minutes in some directions in the peak periods. This work highlighted that the most significant cause of delay in this area was the signalised junction of the A57 and the local B6174.
- 5.6.8 While there appears to be some discrepancy between the two sources of data, the Trafficmaster analysis is based on a larger number of ‘observed’ movements through the route and is an average of movements over two neutral months.
- 5.6.9 Using a combination of journey-time analysis, link capacity data and contemporary understanding of junction operation from HA analysis⁴, it is understood that the junctions on the HA’s route which are subject to the most significant delays are:
- M67/A57/A560 – Hattersley Roundabout;
 - A57/B6174 – Jollies Corner Junction;
 - A57/A6018 – Back Moor Junction;
 - A57/A628 – Gunn Inn Junction;

⁴ Aone+ on behalf of the HA as been undertaking a study of the A57 to identify the location of junction delays and identify potential solutions.

- A616/A61 – Westwood Roundabout; and,
- A616/Thornccliffe Road Roundabout.

Six junctions on the HA's Trans-Pennine route have been identified as being subject to significant delays including the M67/A57/A560, A57/B6174, A57/A6018, A57/A628, A616/A61 and A616/Thornccliffe Road.

5.6.10 Without detailed surveys and/or modelling of individual junctions it is not at present possible to provide a detailed commentary of the extent of delay caused by each junction. Furthermore, in the built up area in the villages of Mottram, Hollingworth and Tintwistle, there is significant interaction between a number of junctions and the delays at some reduce the capacity of others. From the work Aone+ has been undertaking for the HA, it is believed that the A57/B6174 'Jollies Corner' junction is the primary cause of delay on that section of the A57.

5.6.11 Earlier in this section analysis revealed that link capacity is not presently a constraint on the HA's network, therefore, the low average speeds will be for a number of other reasons. While the most significant delays on the HA's route are caused by junctions, knowledge and experience of the HA also identifies a number of other causes:

- The topography of the routes, particularly the A628 and A616, combined with a lack of frequent over-taking opportunities, results in slow-moving vehicles reducing the average speed of traffic;
- The horizontal alignment of the A628, with frequent bends also slows traffic; and,
- On-road parking within the villages of Mottram, Hollingworth and Tintwistle reduce the carriageway widths and therefore the capacity of the links.

In addition congestion at junctions, delays on links may also be caused by topography, horizontal alignment and on-road parking.

Local Roads

5.6.12 The 2014 High Peak Local Plan Transport Study⁵ reports on the potential traffic impacts of land use allocations within the High Peak Local Plan. As part of the evidence base, the report has reviewed congestion on the road network within the High Peak area and an assessment of peak period travel times has been made through the use of Trafficmaster data. In addition to the High Peak area, the road network shown also covers some part of the networks in neighbouring authorities and it provides a good indication of the levels of congestion on the following local authority roads within the trans-Pennine route network:

- A6 between Chapel-en-le-Frith to Hazel Grove;
- A57 between the A628 and the eastern edge of the Peak District National Park, close to Sheffield;
- A623 between the A6 to the west of Eyam;
- A624 between Chapel-en-le-Frith and Glossop;
- A very limited rural section of the A625;
- A6187 between the A625 and Castleton;
- A6013 between the A6187 and A57; and,
- The local road between Winnats Pass and Chapel-en-le-Frith.

5.6.13 The above roads make up the majority of the local authority road network of interest to this study. The Transport Study shows that congestion is primarily limited to the urban areas including the A57 through Glossop and the A6 within the Greater Manchester conurbation. Elsewhere there is limited congestion on the trans-Pennine routes. There does appear to be congestion on the rural sections of the network on the A623 between Sparrowpit and Peak Forest, on the A57 Snake Road, and on the road between Winnats Pass and Chapel-en-le-Frith. However, the report highlights that these are uphill sections where overtaking slow moving vehicles will be made more difficult during peak periods due to increased oncoming traffic.

Congestion on the local authority trans-Pennine routes is primarily on the A57 through Glossop and the A6 in Greater Manchester.

⁵ High Peak Local Plan Transport Study, Derbyshire County Council (April 2014)

- 5.6.14 The report goes on to identify congestion in Glossop. However, the most significant congestion appears limited to the junction of the A57 and Woolley Bridge Road, in Woolley Bridge, to the north of Glossop and close to the junction of the A57 and A628.
- 5.6.15 The A6 Corridor Study⁶ has considered the potential impact of predicted traffic growth and demands on public transport within the A6 Corridor (Buxton to Stockport / Manchester) over the next twenty years. As part of the analysis of existing traffic conditions, this study undertook similar congestion analysis to the High Peak Local Plan Transport Study. This report highlights that both the local and strategic highway networks (including the A6) are suffering from severe network stress within the Stockport urban area.

5.7 Journey-Time Reliability

- 5.7.1 From a range of sources⁷, it is known that the A57/A628/A616/A61 northern route across the Pennines is subject to significant journey-time reliability issues.
- 5.7.2 Based on performance against the HA's Strategic Road Network Performance Specification 2013-15, the South Pennines Route Strategy⁸ specifically identifies issues on the A61, which is eighth least reliable in the South Pennines area and 49th least reliable across the country with an on-time reliability measure of 58.1% for the 2012/13 financial year.
- 5.7.3 However, the Route Strategy also highlights the issue of severe weather on the both the A628 and A616 with high winds being an issue on the former and fog being an issue on both roads.
- 5.7.4 Road closure data for the latest four full years has been obtained from A-One+ for the study area. It should be noted that this data excludes any closures made by HA Traffic Officers.
- 5.7.5 A summary of the number of road closures per year is provided in the table below.

⁶ A6 Corridor Study, Stockport Metropolitan Borough Council, (2014)

⁷ Including Highways Agency road closures data, National Networks Trans-Pennine Connectivity Study, South Pennines Route Strategy Evidence Report, Accident Data and Local Highway Authority consultations and feasibility study observations.

⁸ South Pennines Route Strategy Evidence Report Version 2.0

Table 5-22 – Road Closures by Year

Year	No. Road Closures
2010	32
2011	49
2012	25
2013	23
Total	129
Source: Aone+	

5.7.6 As shown in the table above, the greatest number of closures occurred in 2011. The number of closures remained broadly consistent in 2012 and 2013 and was lower than the 2010 figure.

5.7.7 In the latest four year period, a total of 129 road closures have occurred in the study area. This equates to an average of 32 closures per year or one closure every 11.4 days.

On average, the HA's trans-Pennine route suffers from a road closure every 11.4 days.

5.7.8 The road closures which have occurred in the study area are classified by type and these are summarised in the table below.

Table 5-23 – Road Closures by Type

Year	Number of Road Closures by Type						
	Collision	Weather	Broken Down Vehicle	Closure Request	Fire	Other	Total
2010	14	7	4	2	1	4	32
2011	26	12	6	3	2	0	49
2012	11	13	0	1	0	0	25
2013	7	10	0	1	1	4	23
Total	58	42	10	7	4	8	129
%	45%	32%	8%	5%	3%	10%	100%
Source: Aone+							

5.7.9 As shown in the table above, the greatest number of road closures were as a result of road traffic collisions, with a total 58 closures due to road traffic collisions in the latest four year period. This equates to 45% of all closures that have occurred.

5.7.10 The second highest cause of road closures was the weather, with 42 closures ('weather' or 'ice') in the latest four year period, equating to 32% of all closures. The remaining closures were a result of a wide spread of factors, including broken down vehicles and fire.

77% of road closures on the HA's route are as a result of collisions or bad weather.

5.7.11 Details of the start and end time of each of the road closures has been examined and the overall length of closures is summarised in the table below:

Table 5-24 – Duration of Road Closures

Year	Duration of Road Closure							Total
	<1 Hr	1-2 Hrs	2-5 Hrs	5-10 Hrs	10-24 Hrs	>24 Hrs	Unk	
2010	3	10	10	4	1	3	1	32
2011	7	12	17	7	5	1	0	49
2012	3	5	4	4	5	2	2	25
2013	1	1	8	4	6	3	0	23
TOTAL	14	28	39	19	17	9	3	129
%	11%	22%	30%	15%	13%	7%	2%	100%

Source: Aone+

5.7.12 As shown in the table above, the duration of the road closures varies, from a total of 14 closures which lasted less than one hour, to a total of 9 closures which lasted longer than 24 hours. Of the closures long than 24 hours, seven lasted between one and two days and the other two lasted between three and four days. Three of the road closures did not include a start time and so have been categorised as unknown in the table above. Overall, two thirds of closures were longer than two hours.

Two thirds of road closures on the HA's route last longer than two hours.

5.7.13 The road closures which have occurred on the HA's route have been examined in terms of the road on which they occurred and these are summarised in the table below.

Table 5-25 – Road Closures by Road

Year	Road Closure by Road				
	A57 (1.34 miles)	A628 (13.8 miles)	A616 (10.61 miles)	A61 (1.05 miles)	Total
2010	3	16	11	2	32
2011	2	30	12	5	49
2012	0	19	4	2	25
2013	0	19	0	4	23
TOTAL	5	84	27	13	129
%	4%	65%	21%	10%	100%
Closures per mile	3.7	6.1	2.5	12.4	4.81
Source: Aone+					

5.7.14 As shown in the table above, the majority of road closures have occurred on the A628, with 65% of closures occurring on this road. The remaining road closures are split between the other three roads, with a fifth of the total closures occurring on the A616, a tenth on the A61 and the smallest proportion occurring on the A57 (4%).

5.7.15 The above table provides the total distance of each of the roads that make up the trunk route. When comparing the number of closures to the length of each road, it is clear that the low number of closures on the A57 and A61 correlate to the short length of these roads, though the number of closures is higher on the A61, despite this having a shorter length. The highest number of closures is found on the longest road, the A628, though it is noted that whilst this road is approximately 1.3 times longer than the A616 section, it has experienced over 3 times as many closures in the study period. Comparing the number of closures over period to the length of each road shows that the A61 has by far the highest number of closures per mile, more than double the second highest, the A628.

Local Authority Routes

5.7.16 Derbyshire County Council and Sheffield City Council have confirmed that their routes (A57/A6/A623/A624/A625/A6187/A6013) are subject to weather related closures and this impacts on journey reliability. Due to its topography, the A57 is the most prone to weather-related road closures but such events also occur on the other routes. Barnsley Council has stated that its section of the A628 is less prone to weather-related closures.

5.8 Environment

5.8.1 An environmental appraisal has been undertaken to understand the environmental issues along the existing HA route. The environmental appraisal process has served to establish the extent and availability of existing environmental information and key environmental sensitivities and interests within and around the route corridor.

- 5.8.2 A route corridor was defined around the existing route and this represents the maximum geographical extent the design team are currently investigating to address the need for intervention. This in effect for the route is a 1.5 km buffer of Section 1 and 1 km for Sections 2 to 7.
- 5.8.3 The environmental appraisal has comprised:
- Identification and review of desk based information relating to known environmental receptors and resources within defined study areas.
 - Compilation and mapping of these receptors and resources and production of an environmental constraints plan.
 - Rating of the identified environmental receptors and resources based on their relative value/importance and/or distance from the existing route.
- 5.8.4 A detailed environmental constraints schedule and detailed environmental constraint maps have been completed by the study team.
- 5.8.5 Desk based data sources have comprised: literature relating to the study area; databases, records and schedules relating to environmental designations, local policy documents; historic and current mapping; recent aerial photography; and data from previous environmental studies.
- 5.8.6 Previous environmental study reports reviewed include:
- Glossop Spur Environmental Statement, October 2005, prepared by Mouchel Parkman Ltd.
 - A57/A628 Mottram – Tintwistle Bypass & A628/A616 Route Restraint Measures Environmental Statement, February 2007, prepared by Hyder Consulting (UK) Ltd and Mowlem Plc.
 - M1 J32 to 35a Smart Motorway Environmental Assessment Report, February 2014, prepared by Mouchel Ltd.
- 5.8.7 Information on the baseline environment has also been collected from a number of previous studies on the Trans Pennine route. These include the South Pennines Route Based Strategy Draft Evidence Report, February 2014, the Trans-Pennine Routes Feasibility Study and the Trans-Pennine Connectivity Study, prepared by URS Infrastructure & Environment UK Ltd in August 2012.
- 5.8.8 Local Planning Authorities (LPAs), Statutory (SEBs) and Non-Statutory Environmental Bodies have not been consulted at this stage. In addition to the aforementioned data sources, data from Agency's Environmental Information System (EnvIS) has been incorporated where appropriate.

- 5.8.9 For the decision-making process during the development of scheme options, Red, Amber, Green (RAG) categories have been defined and these should be taken account of as follows:
- 5.8.10 **RED** – avoidance or minimisation of impact is a key consideration in developing potential scheme options;
- 5.8.11 **AMBER** – avoidance or minimisation of impact is an important consideration in developing potential scheme options and all options should be designed to facilitate mitigation where avoidance cannot be achieved; and,
- 5.8.12 **GREEN** – avoidance or minimisation of impact is desirable but is a lesser consideration in development of potential scheme options.”
- 5.8.13 A schedule of the environmental receptors and resources identified within the study area has been produced. This contains information on the type of receptors and resources, their names, distance from the existing route, source of information, RAG rating and justification for inclusion within identified RAG category. As the Trans-Pennine Route consists of a number of roads, the closest roads to the identified receptor or resource have also been provided in the constraints schedule.

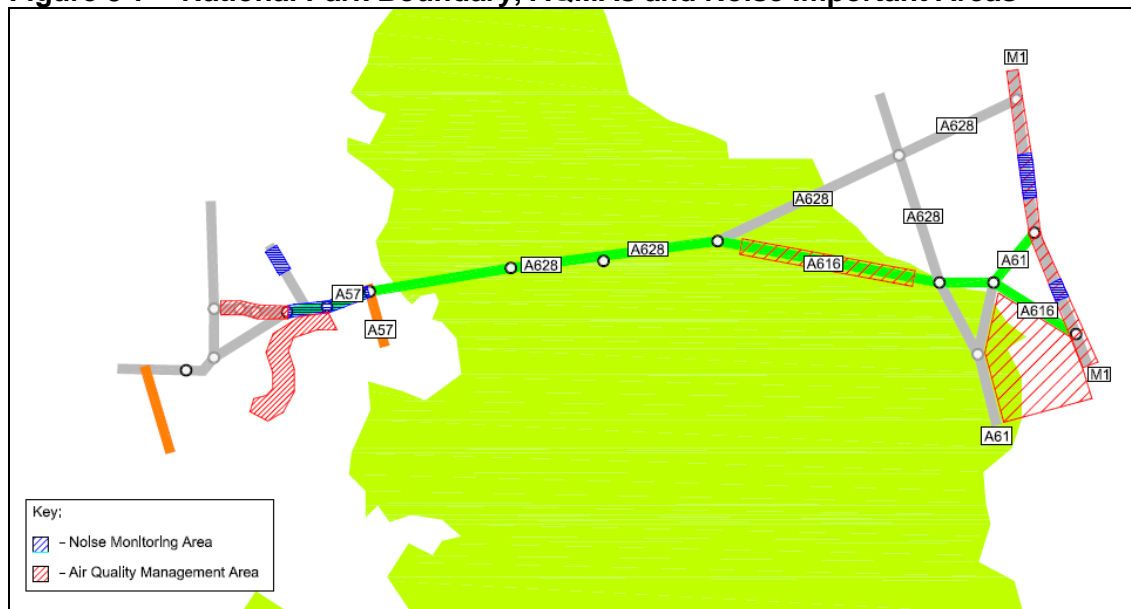
Analysis

- 5.8.14 The Trans-Pennine Route runs through/is bordered by five LPAs:
- Tameside District Metropolitan Council
 - Derbyshire County Council (High Peak Borough Council and Peak District National Park Authority)
 - Barnsley Metropolitan Borough Council
 - Sheffield City Council
 - Rotherham Metropolitan Borough Council
- 5.8.15 The existing route at its western end (A57) runs through the valley of Longdendale cutting through the settlements of Mottram in Longdendale, Hollingworth and Tintwistle. Heading eastwards, the route corridor becomes rural with a number of reservoirs and woodland to the north and south. Past Woodhead bridge, the route (A628) cuts through the Peak District National Park for about 40% of its length before joining the A616. The A616 continues past Stockbridge becoming the A61 which runs past Tankersley in a north-eastern direction to meet the M1 at junction 36 whilst the A616 continues in a south-eastern direction with Westwood Country Park to its south and Tankersley Park Golf Club to its north. All along the route, several disused quarries, shafts and pits can be found; evidence of historic mining and quarrying works in the area.

5.8.16 There are nine Defra Important Areas for noise within the route corridor. The Highways Agency has been identified as the noise making authority on seven of these whilst the local highway authority has been identified as the noise making authority on the remaining two located on the A6018. Four of IAs can be found on the M1 close to the junctions of the M1/A61 and the M1/A616. Of the nine IAs, seven have First Priority Locations (FPL) within them. Defra Noise Important Areas are locations where the 1% of the population are affected by the highest noise levels from major roads according to the results of Defra's strategic noise maps whilst FPLs are Important Areas which have locations with road traffic noise levels in excess of 76dB according to the results of Defra's strategic noise maps.

There are nine Defra Important Areas for Noise on the HA's route.

Figure 5-7 – National Park Boundary, AQMAs and Noise Important Areas



5.8.17 Air Quality Management Areas (AQMAs) are declared where the EU limit and Government standards adopted for nitrogen dioxide (NO₂) and dust particles: particulate matter with an aerodynamic diameter of less than 10µm (PM₁₀) are not being achieved or are in danger of being exceeded. There are four AQMAs within the route corridor. To the western along the A67 and the A57 is an AQMA declared by Tameside MBC for the exceedence of PM₁₀ and NO₂; key acknowledged air pollutants associated with traffic.

5.8.18 Sheffield City Council has also declared a city wide AQMA for the aforementioned air pollutant whilst Barnsley MBC has declared AQMAs along the M1 for NO₂.

- 5.8.19 Baseline air quality monitoring data contained within previous environmental assessment reports have been reviewed as part of this appraisal. Eleven monitoring locations along Section 1 (A57) registered exceedences of the NO₂ average annual mean concentrations over the EU set limit of 40µg/m³ and four additional monitoring locations measured concentration above 36µg/m³ but under the set limit. Further exceedences of the NO₂ objective limit were recorded within Section 2 of the route (A628 through Hollingworth).
- 5.8.20 There were two monitoring locations around the A628 within the Peak District National Park (Sections 3 to 4) with measured exceedences of the NO₂ annual mean concentration limit and two with concentrations above 36µg/m³. There was one record of exceedence of the NO₂ objective limit by Stockbridge and concentrations over 36µg/m³ along the corridor. Within Section 6 (A61 and A616), there were measured concentrations between 36 and 40µg/m³.
- 5.8.21 The location of the identified IAs and AQMAs are typically synonymous with densely populated areas which close to the existing roads - traffic related noise and emission sources. Within the route corridor, the densely populated areas falls to the western (Mottram in Longdendale, Hollingworth, Hadfield and Tintwistle) and eastern ends (Stockbridge, Deepcar, Wortley and Tankersley) of the route. It is therefore expected that these areas will constitute the major areas of concern for traffic related environmental effects. These areas could also present opportunities to address existing noise and air quality issues if traffic can be transferred off the existing route to bypass these areas.

The HA's route passes through four Air Quality Management Areas.

- 5.8.22 The Peak District National Park is located in-between the densely populated areas to the west and east of the route corridor. It contains areas designated as Special Area of Conservation (South Pennine Moors), Special Protection Area (Peak District Moors) and Special Site of Scientific Interest (The Dark Peak). This area is deemed to be a constraint to any intervention outside the existing route due to its high nature conservation, historic, landscape and geological value.
- 5.8.23 As a result of the landscape value of the Peak District, landscapes in and around it have been recognised as Special Landscape Areas within the Local Plans of the Local Planning Authorities within which the route lies.
- 5.8.24 Other environmental resources such as Little Don Stream (SSSI), Spring Meadows (SSSI) and a number of Scheduled Monuments could constrain the definition of options.
- 5.8.25 A review of the Environment Agency's website "What's in my Backyard" revealed the presence of over 60 historic landfill sites and 4 existing sites within the route corridor. Further information on these will be required at Stage 2 to inform the appraisal of options.

There is a range of conservation and landscape designations within the HA's route corridor and many of the trans-Pennine routes pass through the Peak District National Park.

Conclusions

5.8.26 The following table summarises the findings of environmental constraints identification exercise:

Table 5-26 – Environmental Constraints Summary

Assessment Area	Overall Potential Impact (Positive/Negative)	Potential Opportunities and Constraints	Level of Uncertainty (RAG)
Noise	Neutral (at this stage of the appraisal this could be positive or negative)	<p>Potential Opportunities: Reduction of noise through Mottram, Hollingworth and Tintwistle if traffic is removed from the section of road running through these areas.</p> <p>Potential Constraints: 9 Defra Important Areas for Noise – one encompassing the route (A57) and 8 within the route corridor. Reduction in route delays likely to increase use of route.</p>	Orange
Air Quality		<p>Potential Opportunities: Improvement of air quality through Mottram, Hollingworth and Tintwistle if traffic is removed.</p> <p>Potential Constraints: 4 Air Quality Management Area have been identified within the route corridor.</p>	
Greenhouse Gases	Negative	<p>Potential Opportunities: -</p> <p>Potential Constraints: - No data available. However any improvement to the route is likely to make it more attractive to road users thereby increasing greenhouse gases.</p>	Red
Landscape	Negative	<p>Potential Opportunities: None</p> <p>Potential Constraints: Presence of Park District National Park and 6 Special Landscape Areas designations within the route corridor.</p>	Green
Townscape	Neutral (at this stage of the appraisal this could be positive or negative)	<p>Potential Opportunities: - Removal of traffic from Mottram, Hollingworth and Tintwistle,</p> <p>Potential Constraints: - None currently identified</p>	Green

Assessment Area	Overall Potential Impact (Positive/Negative)	Potential Opportunities and Constraints	Level of Uncertainty (RAG)
Heritage of Historic Resource	Negative	Potential Opportunities: None Potential Constraints: 7 scheduled monuments within 1km of the existing routes.	Amber
Biodiversity	Negative	Potential Opportunities: Potential Constraints: 1 SPA, 1 SAC and 1 SSSI within the Peak National Park and 2 additional SSSIs within 50m of the existing route.	Green
Water Environment	Neutral	Potential Opportunities: Opportunity to address 6 Highways Agency Flood Hot spots Potential Constraints: 6 Highways Agency Flood Hot spots	Amber
Note: The level of uncertainty (RAG) is a reflection of the quality of information used to give the potential assessment score and therefore, the degree of confidence in the outcome of the assessment impact score given			

5.8.27 To note the level of uncertainty (RAG) is a reflection of the quality of information used to give the potential assessment score and therefore, the degree of confidence in the outcome of the assessment impact score given. For example we have confidence that any changes to the route would have a potential negative impact on the National Park and the data is recent and up-to-date, this is therefore green. Whereas there are potential positive and negative impacts for noise, so we have scored as neutral, but this could change as although we have high level data, we have not carried out any modelling at this stage, uncertainty is therefore amber.

5.8.28 For each of the HA's roads, the following table provides details of environmental constraints.

Table 5-27 – Environmental Constraints on HA Routes

Roads	Topic	Constraints
A57	Biodiversity	1 x Local Nature Reserve (Hurst Clough ~550m from route) 4 x Ancient Woodland (closest ~ 8,00m Westwood Clough)
	Landscape	2 x Areas of Greenbelt (area adjacent to the A57 – Tameside MBC, area ~ 800m High Peak BC)
	Historic Environment	1 x Scheduled Monument (Melandra Castle Roman Fort ~ 1,000m) 37 x Listed Buildings (closest ~ 40m, furthest ~ 1,450m) 1 x Conservation Area (Mottram Conservation Area – adjacent to the A57)

Roads	Topic	Constraints
	Water Environment	1 x Highways Agency Hotspot (covers section of the A57) 1 x Flood Zone 2 (approximately 250m from the A57 (Trunk)) 3 x Main Rivers (One river – Hurstclough Brook crosses under the A57 close to the M67 roundabout)
	Air Quality	1 x Air Quality Management Area (Tameside) covers A57 section
	Noise	5 x Noise Important Area (1726 covers section of A57, others are 1574, 7247, 1575, 1576 in wider study area)
A628	Biodiversity	1 x Special Protection Area SPA (Peak District Moors adjacent to A628) 1 x Special Area of Conservation SAC (South Pennine Moors adjacent to A628) 1 x Site of Special Scientific Interest SSSI (The Dark Peak adjacent to A628) 2 x Local Wildlife Sites (Brockholes Wood ~ 500m, Swallows Wood ~ 400m) 15 x Ancient Woodland (adjacent = Millbrook Bridge Wood, Didsbury Intake, Unnamed) 1 x Important Bird Area (Peak District Moors adjacent to the A628) 1 x RSPB Reserve (Dove Stone ~ 2,600m from the A628)
	Landscape	1 x National Park (Peak District adjacent to A628) 3 x Special Landscape Areas adjacent to the A628 2 x National Trails (Pennine Bridleway and Pennine Way cross the A628) 2 x Areas of Greenbelt (adjacent to the A628 – Tameside MBC and High Peak BC)
	Historic Environment	3 x Scheduled Monument (Melandra Castle Roman Fort ~ 1000m, Roman fortlet ~220m, Wayside cross ~450m) 45 x Listed Buildings (closest ~ 5m, furthest 1425m) 2 x National Trust Properties (Hope Woodlands ~ 1520m, Derwent and Howden Moors ~ 1400m) 1 x Conservation Area (Tintwistle Conservation Area – wasn't available during search, assumed to be the Tintwistle area adjacent to A628)
	Water Environment	4 x HA Hotspots 2 x Flood Zone 2 (one crosses the A628 around Hurstclough Brook, other 950m away along the River Don) 2 x Main Rivers (Hollingworth Brook – crosses A628 at Millbrook Bridge, Glossop Brook ~ 980m away)
	Air Quality	1 x Air Quality Management Area (Tameside) covers section of the A628 to the Tameside Borough Boundary
	Noise	1 x Noise Important Area (1726 – adjacent at A57 junction)
A616	Biodiversity	1 x SPA (Peak District Moors ~ 500m at closest point)

Roads	Topic	Constraints
		1 x SAC (South Pennine Moors ~ 500m at closest point) 1 x SSSI (Dark Peak ~ 500, Little Don Stream – adjacent, Spring Meadows, Alderman's Head & Cow Croft Meadows ~20m) 1 x Local Nature Reserve (Wharnccliffe Heath ~400m) 4 x Local Wildlife Sites 46 x Areas of ancient woodland (closest -0m, furthest 1400m) 1 x Important Bird Area (Peak District Moors ~ 500m at closest point)
	Landscape	1 x National Park (adjacent Peak District) 2 x Special Landscape Areas (adjacent Barnsley MBC Western Rural Area, Penistone Community area ~ 1100m) 3 x Areas of greenbelt (two adjacent to the A616)
	Historic Environment	3 x Scheduled Monument (Iron Age and Roman quern workings on Wharnccliffe Rocks ~ 740m, Water powered bloomery, iron forge and rolling mill at Low Forge ~ 750m, Romano-British settlements at Finkle Street – 0m) 1 x Registered Park and Garden (adjacent Wortley Hall) 68 x Listed Buildings (closest ~ 5m, furthest ~ 1070m) 4 x Conservation Areas (two adjacent)
	Water Environment	1 x HA Hotspot (Area of Langsett/ Midhopestones) 3 x Flood Zone 2 (one crosses the A616) 2 x Main Rivers (River Don crosses at Soughley Bridge, The Porter or Little Don ~240m)
	Air Quality	3 x Air Quality Management Areas (Sheffield Citywide AQMA, Barnsley AQMA No.1, Barnsley AQMA No.6)
	Noise	2 x Noise Important Areas (6438, 6439 – both in wider study area)
A61	Biodiversity	1 x Local Nature Reserve (Potters Plantation – adjacent) 2 x Local Wildlife Sites (Wharnccliffe Wood, Potters Holes Plantation – both adjacent) 7 x areas of ancient woodland
	Landscape	1 x Special Landscape Area (~ 20m at closest point) 1 x Area of greenbelt
	Historic Environment	1 x Scheduled Monument (~170m) 11 x Listed Buildings (closest ~ 90m, furthest ~ 800m)
	Water Environment	1 x Main River (Blackburn Brook ~ 500m from A61)
	Air Quality	2 x AQMA (Sheffield Citywide AQMA, Barnsley AQMA No.1)
	Noise	3 x Noise Important Areas (6436, 6437, 6438 – all in the wider study area)

5.8.29 Whilst this detailed analysis has not been undertaken for the local roads element of the trans-Pennine route network, these roads are likely to be affected by similar constraints. The Peak District National Park covers the majority of the area between Manchester and Sheffield and only the A616, A61 and A6 do not pass through it.

5.8.30 The following table provides details of the air quality and noise issues on each of the local authority roads.

Table 5-28 – Summary of Air Quality and Noise Issues on Local Authority Roads

Roads	Air Quality Management Areas (AQMAs) and Noise Important Areas (IAs)
A6	2 AQMAs – Stockport AQMA No.2 (extends along the A6 from High Lane through Stockport Town Centre and past the crossing with the M60) and Cheshire East - Disley AQMA (running from the Market Street/ Buxton Old Road crossroads in the West, to the junction with Redhouse Lane in the East)
	12 Noise IAs – 7233, 7232, 7231, 7230, 8205, 7229, 7228, 1527, 1528, 1529, 1530, 1532
A57	1 AQMA – Sheffield Citywide AQMA (Rivelin Dams to city centre)
	3 Noise IAs – 7745, 7746, 2146 (*note joins with the A61 in Sheffield via a roundabout which is covered by IA 2172)
A623	No AQMA
	No Noise IAs
A624	No AQMA
	No Noise IAs
A625	1 AQMA – Sheffield Citywide AQMA (from approx the junction with Sheephill Road into the City Centre)
	8 Noise IAs – 2159, 2094, 2093, 2158, 2157, 2092, 2171, 2091
A628	No AQMAs
	1 Noise IA - 6427
A6187 / Winnats Road	No AQMAs
	No Noise IAs
A6013	No AQMAs
	No Noise IAs

5.9 Society

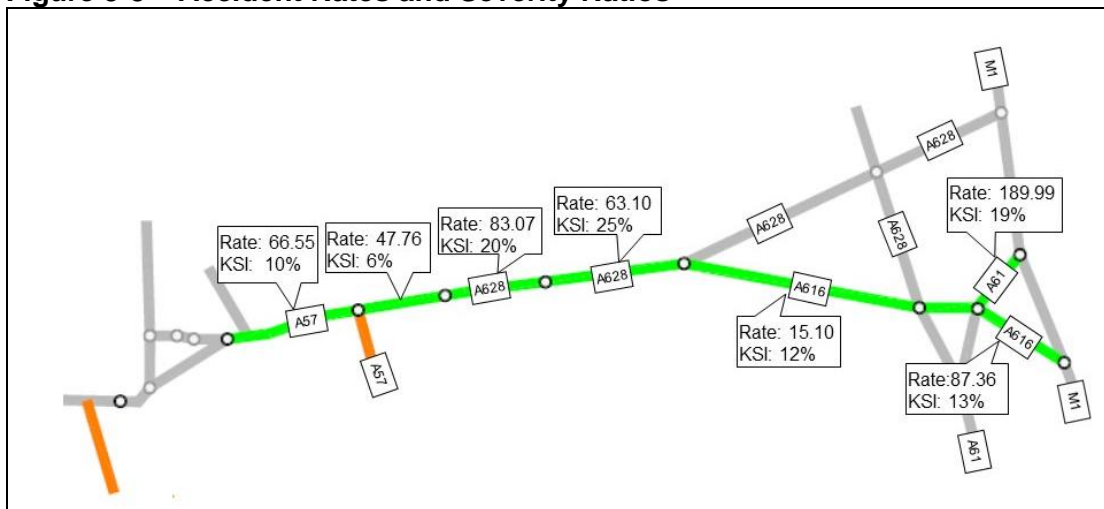
- 5.9.1 The South Pennines Route Strategy Evidence Report highlights the A628 through the villages of Hollingworth and Tintwistle as having high proportion of PIAs involving pedestrians. The report states that *'throughout these villages, the A628 is bordered by residential properties with many boundaries in close proximity to the carriageway edge. The footways are also very narrow in places. However, there are numerous desire lines for vulnerable user movements across the A628 including the Pennine Way National Trail and parts of the national cycle network such as the Longdendale Trail. These lead to potential conflicts with vehicles, particularly when traffic volumes are high during peak travel periods. Where the Pennine Way interacts with the A628 the footways are narrow and there is no tactile paving or dropped curb provision'*.
- 5.9.2 The A6 Corridor Study highlights severe severance through the urban areas between High Lane and Newtown. The report states that *'residents of both High Lane and Disley that would access community facilities such as schools, churches, bus stops, post office, shops, hotels, restaurants, pubs and Disley train station would be required to cross the A6. Due to the existing high traffic flows, this section of the A6 would be considered to result in severe severance for residents between High Lane and Newtown without the A6MARR. With the A6MARR in place, the predicted increase in traffic flows would worsen the severance. As existing severance would already be severe without the A6MARR the predicted impact is slight adverse'*.
- 5.9.3 Stakeholders spoken to as part of this evidence gathering process have also highlighted severance issues, however, not as significant, as those identified on the A628. The A57 may cause some severance in Glossop but stakeholders believe there are sufficient pedestrian crossings for this issue to be limited. There may also be severance issues Millhouse Green and at Penistone on the non-trunk A628, where Penistone Grammar School is on the opposite site of the road to its catchment.

Severance and issues for vulnerable users have been identified in urban areas of the A628 and non-trunk A6, A57 and A628.

5.10 Safety

- 5.10.1 The South Pennines Route Strategy highlights trans-Pennine trunk roads, including sections of the A628, A61 and A616, as routes where collisions risks are particularly high. It states that *‘collisions involving overtaking are evident on the rural single carriageway section of the A628. Adverse weather conditions also play a role in increasing the likelihood of a collision on the exposed sections’*. The report also highlights that the single carriageway nature of the A628, A61 and A616, and the frequency of at-grade junctions are likely to increase collisions in these locations. The Strategy documents go on to state that the HA *“is developing a number of Local Network Management Schemes with the intention of improving safety. These schemes will, however, be localised improvements and may not fully address stakeholders’ wider concerns”*.
- 5.10.2 Detailed personal injury accident (PIA) data has been analysed for the HA A57/A628/A616/A61 routes across the Pennines and a number of trends have been revealed. PIA rates and the Accident Severity Ratios for the route are presented in Figure 5-8 below. The numbers killed or seriously injured are shown as a percentage KSI.

Figure 5-8 – Accident Rates and Severity Ratios



Accident (KSI) Rate

- 5.10.3 The following table shows the AADT flows for each of the seven sections of the HA's route, which have been obtained from the TRADS annual reports. Based on these flows the KSI rate per billion vehicle miles has been calculated.

Table 5-29 – KSI Rate per Billion miles (Average per Year)

Section	Two-Way	Distance (miles)	miles	Average KSI per year	KSI per billion miles
1 – A57	36,638	1.34	18,030,836	1.2	66.55
2 – A628	14,192	1.61	8,374,786	0.4	47.76
3 – A628	12,367	4.80	21,668,111	1.8	83.07
4 – A628	12,947	7.37	34,867,192	2.2	63.10
5 – A616	14,368	7.57	39,741,601	0.6	15.10
6 – A616	18,532	3.04	20,604,993	1.8	87.36
7 – A61	22,001	1.04	8,421,357	1.6	189.99
Total				9.6	63.28

Source: DfT

- 5.10.4 The table shows a wide range of KSI rates along the route, with a maximum of 190 KSI accidents occurring for every billion vehicle miles travelled in Section 7. Section 5 has the lowest accident rate at 15 KSI accidents occurring for every billion vehicle miles travelled. Overall the route average is shown to be 63 KSI accidents occurring for every billion vehicle miles travelled.
- 5.10.5 It should be noted that, due to the relatively short section lengths along the route, the accident rate is very sensitive to changes in the number of KSIs.
- 5.10.6 A review of Table RAS10002 of the DfT's 'Road Safety Statistics' shows that the national average over the five year period (2007-2011) on rural A-roads ranged between 57 and 69 KSIs for every billion vehicle miles travelled, with an average of 62 KSI. For urban sections of A-roads the national average increases to a range between 108 and 126 KSI for every billion vehicle miles travelled, with an average of 117.
- 5.10.7 Based on the national averages for urban and rural section along A-roads, the number of KSIs along Section 1 and Section 2, which are urban in nature, fall well below the national average. In the rural area, Section 3 has an accident rate substantially above the national average, while Section 4 is close to the average and Section 5 is significantly below the average. Section 6 is also substantially above the national average for rural roads whilst Section 7 is above the national average for both urban and rural roads.
- 5.10.8 Overall, the rural sections of the A628, the eastern end of the A616 and on the A61 have KSI accident rates above the national average; this analysis is supported by outputs from the South Pennines Route Strategy.

Personal Injury accident rates on the rural sections of the A628, the eastern end of the A616 and on the A61 are above the national average.

Personal Injury Accident Severity

5.10.9 The table below shows the percentage of all PIAs which were categorised as KSIs.

Table 5-30 – Killed and Serious Injured / PIA Ratio (2005-2011)

Section	Total PIAs	Total KSI	Ratio of KSI to All PIAs
1 – A57	63	6	10%
2 – A628	31	2	6%
3 – A628	44	9	20%
4 – A628	44	11	25%
5 – A616	25	3	12%
6 – A616	70	9	13%
7 – A61	43	8	19%
Total	320	48	15%
Source: DfT			

5.10.10 The table above shows that the KSIs represented 15% of all PIAs, with Section 3, Section 4 and Section 7 recorded as having higher than average rates. Section 3 and Section 4 are the sections through the Peak District National Park with road sectional significant changes in horizontal and vertical curvature. Section 7 is subject to the national speed limit with increased carriageway width on the approach to the M1 Junction 36.

5.10.11 A review of Table RAS10003 of the DfT's 'Road Safety Statistics' shows that the national average severity rates over the same five year review period was recorded to be 14.8% for all road types and speeds. The average severity rates by different A road speeds, that are similar to those experienced along the route, are as follows:

- 30mph = 12.8%
- 40mph = 14.0%
- 50mph = 16.6%
- 60mph = 22.4%

5.10.12 Based on the national average accident severity rate for each speed limit, it can be determined that the over the length of the route the recorded PIA rate is very similar at 15%, while the different speed limit sections of the route are comparable to the national averages. It is therefore concluded that the route currently falls in line with the national average in the ratio of KSIs to total PIAs.

Accident severity on the HA's route falls in line with national averages.

Accident Factors – Weather

5.10.13 The table below provides a summary of the weather conditions for each PIA. The percentage of recorded PIAs occurring during adverse weather conditions has also been provided to determine the frequency of these accidents.

Table 5-31 – PIA Weather Factors by Section (Average per Year)

Section	Average PIAs per Year	Fine	Unknown/ Other	Adverse	% Adverse
1 – A57	12.6	9.8	0.8	2.0	16%
2 – A628	6.2	4.8	0.4	1.0	16%
3 – A628	8.8	6.2	1.0	1.6	18%
4 – A628	8.8	4.8	0.2	3.8	43%
5 – A616	5.0	4.4	0.2	0.4	8%
6 – A616	14.0	11.4	0.2	2.4	17%
7 – A61	8.6	6.4	0.2	2.0	23%
Total	64.0	47.8	3.0	13.2	21%
Source: DfT					

5.10.14 The above table shows that approximately 21% of the recorded PIAs occurred when there were adverse weather conditions with a significant increase shown in Section 4 at 43% of accidents. This section is the highest peak over the Pennines and has the majority of the steeper gradients along the route, both of which would likely to have a greater detrimental effect due to adverse weather.

5.10.15 A review of Table RAS1006 of the DfT's 'Road Safety Statistics' shows that the national average in 2011 on built-up roads, similar to Section 1 and Section 2, was 11.8% of PIAs occurred during adverse weather conditions and on non built-up roads, similar to the other 5 sections, was 16.3% of accidents.

5.10.16 Based on the national average for PIAs occurring during adverse weather conditions it can be determined that, other than Section 5, the number of PIAs recorded on both built-up and non-built up sections are higher along the length of the route. It can therefore be concluded that the route has a higher than average number of PIAs occurring during adverse weather conditions, compared to the national average. This is likely due to the nature of the route crossing the Pennines with significant horizontal and vertical alignment changes.

The HA's route suffers from a higher than average number of personal injury accidents in adverse weather conditions.

Accident Factors – Day/Night

5.10.17 The following table provides a summary of the light conditions at which the recorded PIAs occurred. The percentage of PIAs recorded as occurring when dark, including lit and unlit conditions, has also been calculated.

Table 5-30 – PIAs Light Factors by Section (Average per Year)

Section	Average PIAs per Year	Light	Darkness	% Darkness
1 – A57	12.6	9.6	3.0	24%
2 – A628	6.2	4.8	1.4	23%
3 – A628	8.8	5.4	3.4	39%
4 – A628	8.8	5.8	3.0	34%
5 – A616	5.0	4.0	1.0	20%
6 – A616	14.0	10.6	3.4	24%
7 – A61	8.6	6.2	2.4	28%
Total	64.0	46.4	17.6	28%
Source: DfT				

5.10.18 The summary above shows that on average 28% of the recorded PIAs occurred at night, including both lit and unlit conditions, when the traffic flows would be expected to be significantly lower. Section 3 and Section 4, which are primarily unlit and travel through the Peak District National Park show a significant increase at an average of 34% and 39%, respectively.

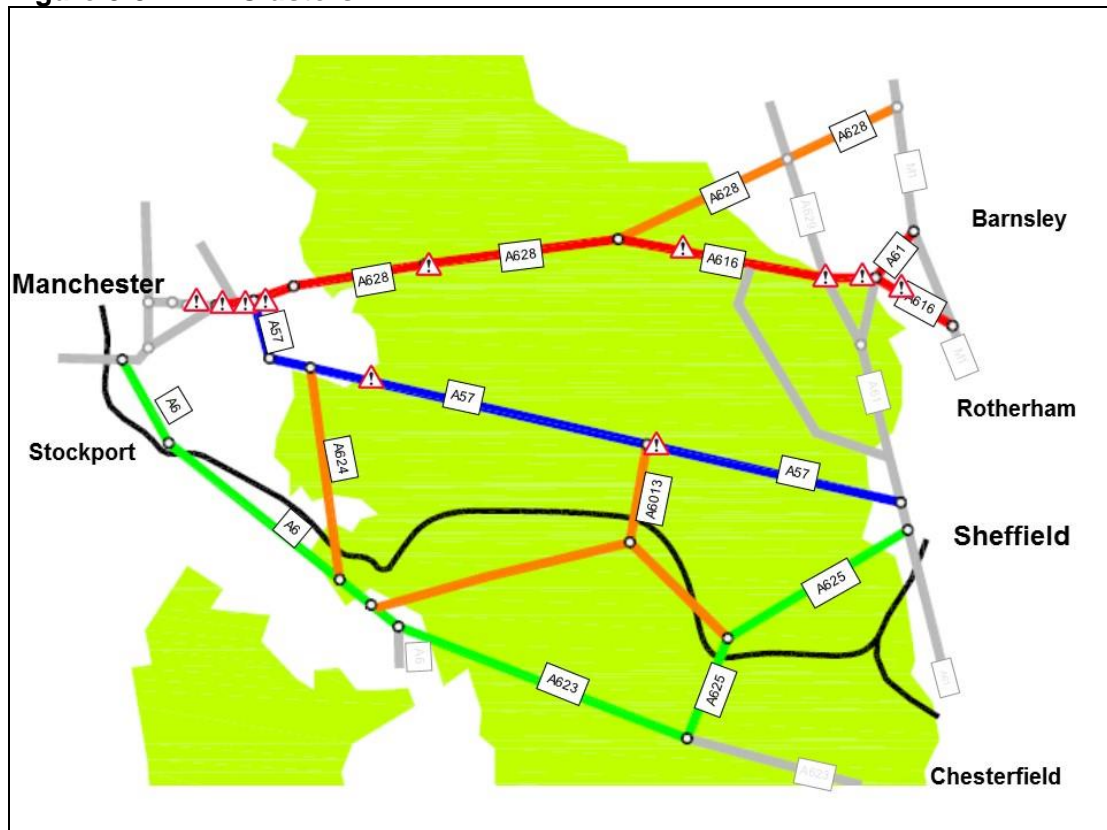
5.10.19 A review of Table RAS1006 of the DfT's 'Road Safety Statistics' shows that the national PIA in 2011 on built-up roads, similar to Section 1 and Section 2, was 25% of accidents occurred at night and on non built-up roads, similar to the other five sections, was 26% of accidents.

5.10.20 Based on the national average for PIAs occurring at night it can be determined that Section 3 and Section 4 are above the national average, while the other 5 sections correspond to those expected on these types of road. It can therefore be concluded that the route is generally in line with the national average, with the section through the Peak District National Park higher when compared to the national average. This is likely due to the nature of the route crossing the Pennines, being predominately unlit with significant horizontal and vertical alignment changes.

Accident Clusters

5.10.21 This section provides a detailed review of any PIA clusters along the route and provides a conclusion of any specific hazardous sections of road. The five year period PIA locations are shown in Figure 5-9.

Figure 5-9 – PIA Clusters



- 5.10.22 Section 1 provides a route through the urban area of Mottram in Longdendale up to the A57 junction to the west of Hollingworth, with signal controlled junctions with B6174, A6018 and the A57 towards Glossop. There are clusters of PIAs at each of these signal controlled junctions, along with a small cluster at the priority controlled junction with John Kennedy Road which is located approximately 600m to the east of the M67 roundabout junction. In general all other PIAs within this section are in individual locations. Given the level of traffic along this section and the urban nature of the road, with a number of side roads property frontages, the locations at the main junctions and spreading of other PIAs are typical of normal road conditions.
- 5.10.23 Section 2 provides two urban sections, through Hollingworth and Tintwistle, with a short rural section between the two. All junctions along this section are priority controlled with a significant number of side roads through both Hollingworth and Tintwistle. Through Hollingworth there are a number of PIAs, but these are generally at individual locations, with no specific clusters. This is also observed through Tintwistle and between the two urban areas, with no specific PIA clusters.
- 5.10.24 Section 3 is rural in nature with a limited number of junctions, which are all priority controlled, and predominately restrict to a 60mph speed limit. The junction with the B6105 to the east of the section shows a small PIA cluster, generally to the west of the junction. The increase in PIAs at this location is likely due to the bend on the approach from the west on the A628, along with the incline and the acute angle of the approach on the B6105. In general all other PIAs within this section are in individual locations.

- 5.10.25 Section 4 is also rural in nature with a limited number of junctions, which are all priority controlled, and restricted to 60mph along the entire length of the section. To the far west of the section the A628 forms a priority controlled junction with the A6024 at which there is a PIA cluster. This is likely due to the incline and the acute angle of the approach on the A6024, along with the potentially restricted visibility to the east. There are a couple of locations, generally on bends, where there are a couple of PIAs recorded, but no other locations that would be described as clusters, along the remainder of the section.
- 5.10.26 Section 5 starts at the roundabout junction between the A628 and A616, to the west of the section, which shows a PIA cluster. This level of PIAs would generally be expected at a roundabout junction between two main roads, within a 60mph speed limit. In addition to this location, there is an accident cluster at the priority controlled junction between the A616 and the B6088, which provides access to Stocksbridge. This junction is located within a 60mph speed limit and provides a ghost island right turn lane and left slip lane, with the main eastbound carriageway on the A616 introducing a climbing lane immediately to the east of the junction. In general all other PIAs within this section are in individual locations.
- 5.10.27 Section 6 has two significant junctions, one with the A629 and one with the A61, both showing clusters of PIAs. The A629 junction provides a left off/left on only arrangement on the A629, allowing all turning movements from the connecting lanes onto the A629. The A61 junction is a 5-arm roundabout with two lane approaches on all arms. Both junctions are located within 60mph speed limits and the number of PIAs are generally considered similar to those that could be expected for the level of traffic and type of junction. In general all other PIAs within this section are in individual locations.
- 5.10.28 Section 7 connects the A616 to the M1 Junction 36 and has two junctions along its length, one to Wentworth Industrial Park and one to Tankersley. Both junctions have a small number of PIAs recorded at them, but not at a level that would generally be considered as a cluster. In general all other PIAs within this section are in individual locations.

A number of personal injury accident clusters have been identified on the HA's route including the most significant clusters at the junctions of the A57(T)/B6174, A57(T)/A6018, A57(T)/A57, A628/A6024, A628/A616, A616/B6088, A616/A61, A616/A629.

Pedestrian Accidents

- 5.10.29 The Route Strategy states that the A628 through Hollingworth and Tintwistle villages (to the east of Manchester) has a high proportion of PIAs involving pedestrians. It comments that *“throughout these villages, the A628 is bordered by residential properties with many boundaries in close proximity to the carriageway edge. The footways are also very narrow in places. However, there are numerous desire lines for vulnerable user movements across the A628 including the Pennine Way National Trail and parts of the national cycle network such as the Longdendale Trail. These lead to potential conflicts with vehicles, particularly when traffic volumes are high during peak travel periods. Where the Pennine Way interacts with the A628 the footways are narrow and there is no tactile paving or dropped curb provision”*.

The HA’s Route Strategy highlights the high proportion of personal injury accidents on the A628 through the villages of Hollingworth and Tintwistle.

Local Roads

- 5.10.30 The High Peak Local Plan Transport Study identifies a number of PIA clusters in the High Peak area; however, only one, at Hope Woodlands A57 Snake Road adjacent to Nether North Grain, is on one of the trans-Pennine routes.

5.11 Asset Condition

- 5.11.1 The Route Strategy Evidence Report highlighted the HA’s trans-Pennine route on a number of occasions in terms of challenges related to asset conditions.

Carriageway surfaces

- 5.11.2 The Strategy states that the A57, A628, A616 and A61 were not constructed to current HA standards and which leads to the pavements on these sections being prone to requiring deep structural repairs, which can be complicated by constraints on maintenance activities.

Structures

- 5.11.3 The Route Strategy Evidence Report states that there are locations particularly on non-motorway trunk roads, such as the A628, where the vertical and horizontal alignment has led to numerous parapet strikes, requiring temporary concrete barrier installation and repair works.
- 5.11.4 Also on the A628, a large proportion of the retaining walls have current or repaired sections of impact damage. This is an ongoing issue with impacts occurring on a regular basis.

Geotechnical

- 5.11.5 The A628 is predominantly single carriageway with limited or no verges. Defects occurring close to the carriageway on this route have significantly more potential to create network disruption than those on the areas' motorways. Maintenance and repair of defects is also more difficult, as it requires restricting traffic to a single lane under traffic management. Large sections of the Woodhead Pass section are constructed on sidelong ground, with the land either side of the kerblines being outside our ownership and, additionally, subject to the planning restrictions imposed by the National Parks Authority.
- 5.11.6 High rainfall in the area is channelled beneath the road in substandard culverts. Surface water runoff is thought to be the cause of many of the earthwork defects recorded. Following several landslip incidents along the A628 in recent years, a geotechnical study is currently underway, covering a 12.5mile stretch of the A628 between Tintwistle and Chapel Brow. The objective of this study is to determine the works required in order to prevent further landslip activity which would adversely affect the A628 running lanes.

Maintenance Operations

- 5.11.7 In terms of undertaking maintenance operations, the HA has stated that it currently undertakes an annual total closure of the route to allow maintenance works to be undertaken. Any pavement schemes for the route are grouped together and delivered under such closures which tend to be a week's duration of night time closures. The local authorities are invited to share the closures to undertake their sweeping and litter clearance duties.

Technology

- 5.11.8 The HA has confirmed that its route lacks significant technology provision and such provision is currently limited to speed cameras on A616, one manually controlled portable Variable Message Sign and traffic lights at the junction on the A57 (these are managed by Greater Manchester Urban Traffic Control Team).

Local Roads

Structures

- 5.11.9 Consultations with Derbyshire County Council have revealed that there are significant retaining walls on the A6 which represent a significant ongoing maintenance liability and work has recently been completed on sections of the route outside of the trans-Pennine routes.

Geotechnical

- 5.11.10 Derbyshire County Council has stated that the A57 is subject to significant risk of land slippage which can result in road closures and resulting impacts on connectivity.

Maintenance Operations

- 5.11.11 In a similar way to the majority of the HA's trans-Pennine route, maintenance operations on the local authority roads will cause issues with journey-time reliability due to the single carriageway nature of the majority of the roads.

Technology

- 5.11.12 Local authorities have confirmed that the local roads lack technology in the form of systems to support detection of journey-time reliability issues (e.g. weather-related road closures) and the dissemination of that information to drivers.

A number of asset condition issues have been identified on both the Strategic Road Network and local roads including construction standards, collision-related damage, earthworks defects, maintenance disruption and a lack of technology.

5.12 Summary

- 5.12.1 This section has presented information from a range of policy, strategy and primary data sources to provide an evidence base for the current situation within the trans-Pennine routes. The Route Strategy has provided a number of inputs, however, this information has been supplemented by other data sources including previous study work and consultations with stakeholders.
- 5.12.2 The section sets the context of the trans-Pennine routes within the wider transport network and city region policy framework. The individual routes through the study area are described and key datasets have been analysed to provide an evidence base for the identification of challenges.
- 5.12.3 Analysis has revealed:
- Limited commuting, business and freight travel between Manchester and Sheffield compared to movements between Manchester and Leeds;
 - Journey time reliability issues caused by weather, accidents and maintenance;
 - Significant environmental constraints but also environmental impacts in the form of AQMA and Noise Important Areas; and,
 - Significant maintenance issues on a number of routes;
 - Congestion at a number of locations within the built up areas including on the A57, in Glossop and Stockport;
 - High PIA rates on the HA's route and a number of accident clusters;
 - There is crowding on the Hope Valley Railway Line, between Manchester and Sheffield,

6 Understanding the Future Situation

6.1 Introduction

6.1.1 This section provides a commentary on the potential for growth within the trans-Pennine route network and the travel market it serves. Outputs from the South Pennines Route Strategy have provided inputs into this section. However, further analysis has been undertaken of local plans and discussions have also been held with the relevant local authorities.

6.2 Inter-regional Connectivity

6.2.1 During the course of this feasibility study, growing and significant national focus has been placed the relatively poor connections between the major cities of the North and the drive to build a stronger and better connected economy across those regions – the Northern Powerhouse. In setting out the policy and strategy focus for the development of improved connections across the North, two particular publications have been prominent; One North – A Proposition for an Interconnected North⁹ and Rebalancing Britain – From HS2 towards a national transport strategy¹⁰.

One North – A Proposition for an Interconnected North

6.2.2 This report highlights that the key outstanding issue, as highlighted by the Higgins *HS2 Plus* Report¹¹, is HS2 alone will not resolve the issues of poor connectivity between the major northern cities and between the cities and the major international gateway airports and ports. The basis on the One North proposition is to resolve these issues.

6.2.3 One North has been developed as a strategy spanning the North of England and in a partnership of the Northern city regions surrounding Leeds, Liverpool, Manchester, Newcastle and Sheffield. With greater connections between the city regions, the One North strategy aims to deliver a 'powerful and integrated series of economic geographies' to provide a counterweight and complement to the strong London economy.

6.2.4 The report sets out a number of guiding principles for the delivery of the One North strategy:

- Growing the national economy by developing the North's economy as a whole by transforming connectivity

⁹ One North – A Proposition for an Interconnected North, July 2014, 1 North

¹⁰ Rebalancing Britain – From HS2 towards a national transport strategy, 2014, HS2 Ltd.

¹¹ HS2 Plus, 2014, HS2 Ltd

- Developing a multi-modal approach to connectivity for both freight and personal travel
- Rail will have a greater role to play in connectivity, which will mean investment in new rolling stock and infrastructure to support growing demand and reduce operating costs with the target of increased capacity, transformed connectivity and reduced public subsidy.
- The North's economy will become more productive, more competitive and more efficient through the development of a more balanced, transformed interconnected transport network
- Value will be maximised by prioritising investment that delivers the best overall return to the taxpayer
- Making the North a destination of choice through delivering a transformational proposition through major capital investment in HS2 and the North's interconnected city regions.

6.2.5 The report sets out what investment in connectivity and capacity is required for the North to become the economic powerhouse:

- Continuing the Highways Agency's improvement programme to resolve pinch-points and implement best practice in operational management with additional investment in key missing strategic links, including to ports.
- A new 125 trans-Pennine rail route, linked to HS2 and the existing network, connecting the city regions, Manchester Airport and the ports.
- Good access for freight by rail, road and water including not only ports, rail links and distribution centres but also light commercial vehicles and airports.
- Investment in railfreight focussed in port connections and rail-linked distribution centres.
- Improving connections between South and West Yorkshire addressing key gaps in the strategic networks.
- A new railway between Newcastle and Darlington.
- A programme of rail service development for each city region to widen the benefits brought by HS2, with new rolling stock, developing hub stations and enabling direct connections.
- Early adoption of key elements of HS2, including commencing construction from the north (as well as the south) and integrating it with the new trans-Pennine link.

6.2.6 Overall, the proposition means spending in the region of £10-15bn. The report sets out the details of the above plans including indicative timescales with the improvements to be delivered by 2030.

Rebalancing Britain – From HS2 towards a national transport strategy

6.2.7 The document, written by Sir David Higgins, Executive Chairman of HS2, follows on from the *HS2 Plus* report from March 2014, which highlighted that a combination of capacity constraints, predominantly in the South, alongside poor connectivity, particularly in the North, were increasing the unbalanced state of the national economy, with London growing too quickly and the Midlands and North underperforming. This second report provides a further set of conclusions and recommendations for the development of HS2 and resolving wider connectivity and capacity issues. The key messages of the report are:

- The strategic proposals for HS2 is correct with an Eastern leg from Birmingham to Leeds via the East Midlands and South Yorkshire, and a Western leg from Birmingham to Manchester via Crewe
- The proposed hubs in the East Midlands and South Yorkshire are the best solutions for their regions.
- The North West hub should be at Crewe and its delivery should be accelerated to 2027 instead of 2033.
- Leeds station will need to be remodelled to support HS2 and improved East-West services.
- Substantially improved East-West rail services across the North are both desirable and possible with the potential for Manchester to Leeds journey times of between 26 and 34 minutes and double the number of trains per hour amongst other significant journey time savings.
- Sir David Higgins strong recommends that the Government and local authorities work together to deliver the One North proposition by agreeing a way forward for turning the analysis into a plan.
- Lessons should be learned from HS2 Phase One to ensure that Phase Two is built more quickly and cheaply.
- A new body should be formed, 'Transport for the North, representing the five city regions across the North, to enable the North to more strongly put forward its case for investment.

6.2.8 The overall message is that HS2 cannot deliver the required connectivity improvements across the North alone and that substantial further investment is required, promoted by a single, stronger voice for the North.

6.3 Strategic Economic Plans

- 6.3.1 The Strategic Economic Plans for the Greater Manchester, Sheffield and D2N2 city regions provide the direction for growth in these areas over the coming decades. These documents are reviewed below.

Greater Manchester Growth and Reform Plan

- 6.3.2 The Greater Manchester Growth and Reform Plan, published in March 2014 and produced by the City Region and Local Enterprise Partnership, recognises the importance of the relationship between Greater Manchester and its surrounding areas and its access to other major conurbations such as Merseyside and the Leeds and Sheffield city regions. It states that Greater Manchester is *'positioned at the heart of the North, along the axes of the main national motorway corridors and key railway connections – Greater Manchester's productivity and prosperity is intimately connected with the wider economic growth potential of the North'*.
- 6.3.3 Greater Manchester places connectivity and transport at the centre of its economic strategy and will focus investment to improve connectivity locally, nationally and internationally. The Strategy highlights that there is significant investment, both planned and underway, in Greater Manchester's transport network, including the following:
- The initial £1.5 billion Greater Manchester Transport Fund (GMTF) includes new Metrolink lines, transport interchanges, rapid bus system developments and strategic highway schemes;
 - The 'Earn Back' model provides scope to extend GMTF spending power by up to a further £500 million by 2020, enabling the delivery of further transport priorities that offer significant GVA potential, such as the Metrolink extension to Trafford Park and funding for SEMMMS (the A6 to Manchester Airport relief road), which will deliver enhanced access to the Airport City Local Enterprise Zone; and,
 - The £560 million investment in the Northern Hub rail scheme, scheduled for delivery by 2019, is estimated to have an economic impact of £2.1 billion each year across the North of England.
- 6.3.4 It is also identified that the planned investment strategy will add particular value to the *'Highways Agency Route Strategy priorities for Greater Manchester, by complementing the current HA pinch-point programme and supporting key local highway investment measures that improve the flow between strategic and local highway systems'*.
- 6.3.5 The trans-Pennine Route Feasibility Study is acknowledged and is considered to be of fundamental importance in identifying a range of future options for trans-Pennine routes, and a commitment to fully input into the analysis, option generating and delivery of proposals is stated.

- 6.3.6 The A6 to Manchester Airport Relief Road scheme, connecting the A6 at Hazel Grove to the Airport Link Road at A555 is outlined. This relief road will provide much needed improved connectivity to the airport but will also relieve some capacity on the congested A6 route, improving connectivity for strategic routes in south Manchester.
- 6.3.7 HS2 is identified as a very major source of potential growth which must be exploited in the region in terms of generating jobs within the region, regenerating areas around the HS2 hubs and freeing up capacity and therefore potentially improving rail services for existing rail routes.
- 6.3.8 The Plan acknowledges the HS2 Plus report by David Higgins and commits to working with neighbouring northern LEPs in order to develop optimal trans-regional transport solutions which will maximise the economic potential which HS2 offers the north of England.
- 6.3.9 It is acknowledged in this Plan that further investment in transport connectivity along the east-west corridor in the north of England i.e. between Liverpool, Manchester, Sheffield and Leeds, will provide significant benefits not only for the north but also to the UK as a whole. As such in the Greater Manchester Local Transport Plan 4 which is under development and due to be published later in 2014, prioritisation will be on improving local connections, improving access to employment opportunities from a wider geography, given the capacity freed up on classic rail lines due to the introduction of HS2.
- 6.3.10 A number of major scheme priorities are identified for the Greater Manchester area including Stockport Town Centre Major Scheme. This is a proposal covering the whole of the town centre of Stockport but there are specific measures identified for the A6 corridor through Stockport, including:
- A6 corridor enhancements between George's Road and Bramhall Lane including improved pedestrian and bus provision;
 - New link road between the A6 and Travis Brow;
 - Improved access to Stockport rail and bus stations;
 - Bus priority improvements including along the A6;
 - New and improved cycle routes;
 - Improved cycle and pedestrian links; and,
 - Upgraded signing strategy.
- 6.3.11 Expected benefits of the scheme are the reduction of traffic on the A6 travelling through the town centre and the improved connectivity this will provide for pedestrians between the rail and bus stations and the retail core of the town centre.

Sheffield City Region Strategic Economic Plan

6.3.12 The Sheffield City Region (SCR) Strategic Economic Plan (SEP) was submitted to Government in March 2014 and produced by the City Region and Local Enterprise Partnership. Its vision for the region is; ‘*A City Region with a stronger and bigger private sector that can compete in national and global markets*’. The ambitions of the SCR to 2024 are set out as follows:

- Create 70,000 net new jobs, with 30,000 in highly skilled occupations;
- Increase GVA by £3.1billion; and,
- Generate 6,000 new start-up businesses.

6.3.13 The strategic objectives of the SEP for the Sheffield City Region are to:

- Ensure SCR businesses have the support they need to realise their full growth potential;
- Become more outward looking; and,
- Provide the conditions that businesses need to prosper and become more resilient.

6.3.14 The SEP sets out how it will achieve these objectives by securing investment in infrastructure where it will do most to support growth and increase sales of the City Region’s goods and services to other parts of the UK and abroad.

6.3.15 There is particular focus on the following elements which will enable the identification and implementation of activities or measures in order to deliver the vision and objectives for the region economically:

- External connectivity;
- Transformational schemes;
- Enabling infrastructure;
- Developing export potential;
- Export challenge;
- Harnessing export growth; and,
- Proactively targeting high growth markets.

- 6.3.16 The SCR is centrally located nationally and the SEP looks to capitalise on its proximity and economic linkages with other key markets, including Greater Manchester, Leeds, Hull and Humber, Birmingham and Nottingham.
- 6.3.17 In terms of infrastructure, the SEP aims to improve SCR's external connectivity, nationally and internationally, by air, road and rail, including maximising the benefits of high speed rail which is seen as key to the region's future growth. Secondly, it aims to ensure that infrastructure supports the efficient movement of goods and people across the SCR, enabling residents, businesses, employees and visitors to access the range of opportunities available.
- 6.3.18 Congestion on the road network is identified as a challenge to the economic growth of SCR. With demand and congestion rising, ongoing investment in the transport network is needed to enable the SCR's economy to prosper and grow.
- 6.3.19 The SEP sets out SCR's commitment to working with the HA in order to develop route strategies and makes a request that the HA develops, in conjunction with SCR partners, a realistic, long term solution for trans-Pennine road access to Manchester and that this forms a pilot project for a formal protocol.
- 6.3.20 The arrival of HS2 is identified as a major factor which needs to be capitalised upon and that the SCR needs to ensure that benefits from HS2 are fully maximised by ensuring local connectivity to HS2 is in place. It is predicted that the economic and regeneration benefits to be brought by the introduction of the HS2 station in the region will be significant in achieving the ambitions of the SEP.

D2N2 Strategic Economic Plan

- 6.3.21 The D2N2 Strategic Economic Plan submitted to Government in March 2014, covers the Derby, Derbyshire, Nottingham and Nottinghamshire Local Enterprise Partnership area. The Plan sets out the vision for the area: '*A more prosperous, better connected, increasingly resilient and competitive economy*'. The Plan also identifies a single target; '*to create an additional 55,000 private sector employee jobs by 2023*'. To achieve this target, the Plan identifies economic infrastructure, including a world class transport system, as being a key aspect of its proposals and includes this in its strategic priorities which are listed below:
- Business support and access to finance;
 - Employment and skills;
 - Infrastructure for economic growth; and,
 - Innovation.

- 6.3.22 By 2023, it is envisaged that D2N2 is recognised as a place which, amongst other things, is the best connected place in the country, is at the heart of the national economy and all communities are able to contribute to growth and prosperity regardless of location.
- 6.3.23 To achieve these ambitions, it is identified that the infrastructure and conditions that will support business and employment growth needs to be put in place, including infrastructure that meets the needs of the 21st century economy. This specifically includes a world-class transport system that allows D2N2 to capitalise on its central position at the heart of the national road and rail network, with links to international markets via HS2, East Midlands Airport, other airports including Manchester, Robin Hood and Birmingham and providing excellent local connectivity.
- 6.3.24 The critical role the strategic road network plays in connecting the area to international gateways and other major cities is identified. The D2N2 area is strongly dependant on airports outside of the area for international connectivity, including Manchester as indicated above. Access to global markets via ports and airports, supported by effective strategic road and rail connections, is critical in meeting the area's growth requirements.
- 6.3.25 HS2 will also have a major impact on connectivity of D2N2 to destinations further afield upon which its economy can prosper. The plan sets out proposals to capitalise on the arrival of HS2 and sets out to lead on developing a regional connectivity package to deliver improved connectivity across the D2N2 area, and fully capture the benefits of HS2 for the East Midlands economy.
- 6.3.26 The transport infrastructure is identified as being a key element in delivering the ambition of the plan. Without the necessary step changes in transport infrastructure investment across the area then the D2N2 would face serious constraints in terms of delivering its ambitions.
- 6.3.27 In order to outline its infrastructure strategy the D2N2 area is broken down into six areas as follows:
- Derby (includes Derby City, Amber Valley, Erewash & South Derbyshire);
 - North Eastern Derbyshire (includes Bolsover, Chesterfield & North East Derbyshire);
 - Peak (includes Derbyshire Dales and High Peak);
 - Greater Nottingham (includes Nottingham, Broxtowe, Gedling & Rushcliffe);
 - Mid Nottinghamshire (including Ashfield, Mansfield and Newark & Sherwood); and,
 - North Nottinghamshire (including Bassetlaw).

6.3.28 Opportunities and challenges have been identified for each of the areas with the relevant opportunities and challenges affecting trans-Pennine routes (Peak District National Park area) summarised below.

- **Opportunities**

- World class natural environment and offer for visitor economy;
- Strong linkages with surrounding cities, offering high quality housing and recreation opportunities;
- Key towns as local centres and foci for local growth, including Ashbourne, Matlock, Bakewell, Buxton, New Mills and Glossop; and,
- Strong business sector in manufacturing, food and drink.

- **Challenges**

- Poor trans-Pennine connectivity, both road and rail, and focused challenges on routes into Greater Manchester;
- Need to improve quality of place to transform the potential of Buxton as one of England's leading spa towns for visitors, building from a strong base;
- Ability to unlock growth in key towns; and,
- Broadband cold spots in rural areas which hampers growth of SMEs, both in terms of coverage and slow speeds.

6.3.29 As well as the area specific opportunities and challenges outlined above, the strategy also identifies some shared opportunities and challenges which are relevant across the D2N2 area:

- **Opportunities**

- HS2 will transform D2N2's national and international connectivity, increasing the area's attractiveness as a business location. D2N2 LEP are strongly committed to providing local transport links to the proposed HS2 station to ensure that D2N2 fully benefits from this transformational national project;
- Collaboration with adjacent areas to deliver shared infrastructure priorities, including SCR, LLEP, Greater Lincolnshire, Stoke & Staffordshire and Greater Manchester;

- Sustainable travel programmes are delivering a step-change in attitudes to active travel and public transport and are reducing car dependence for journeys to work and local centres; and,
- Ambition to transform cycling across the D2N2 area with transformational projects in Derby and Nottingham.

- **Challenges**

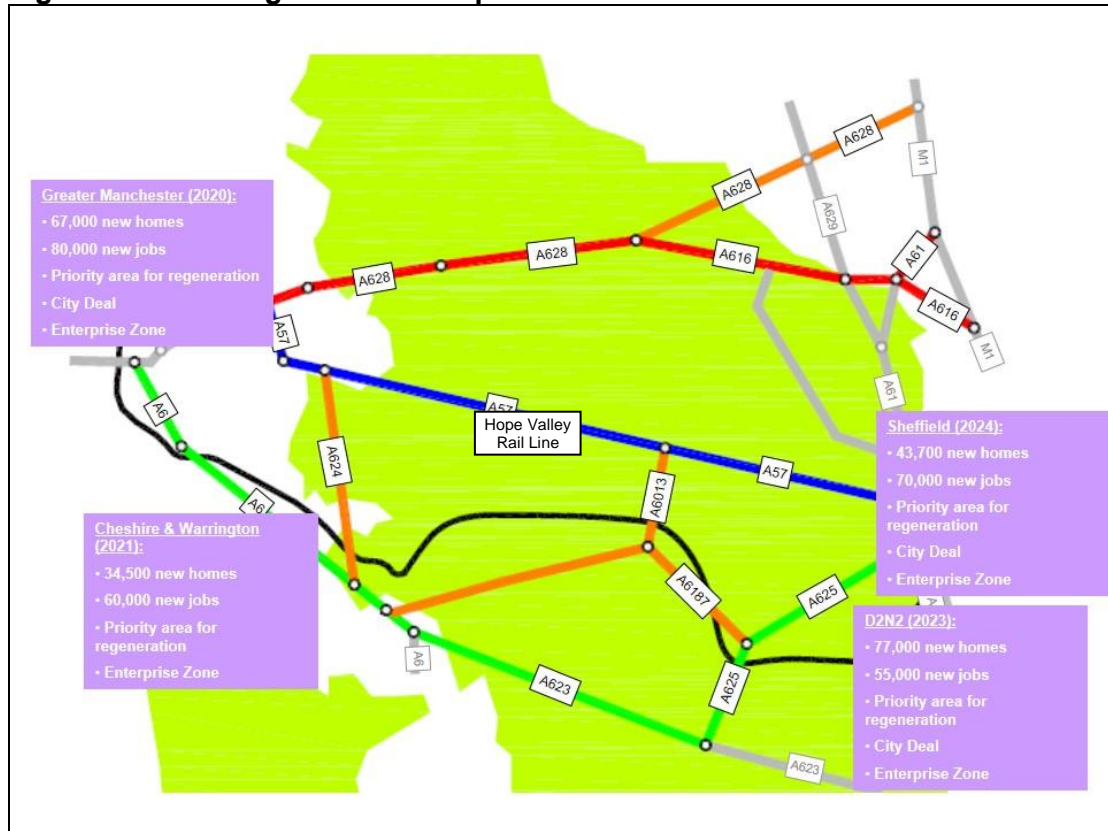
- Ensuring good inter-urban connectivity to meet the needs of businesses and commuters in D2N2 and adjacent areas, including improved opportunities for journeys by rail and targeted improvements to key highway corridors;
- Extensive congestion on strategic and local road networks, which impacts on business connectivity, labour markets and is constraining D2N2's growth potential;
- Maintenance and adaptation of the highway network to ensure resilience in response to extreme weather and continued levels of service to meet the needs of the D2N2 economy. This is particularly important in our rural areas where economies are vulnerable to closure of key routes; and,
- Broadband connectivity across large areas of both Derbyshire and Nottinghamshire: cold spots in rural areas and the need to provide ultra-fast broadband to meet business needs in Derby and Nottingham.

6.3.30 The strategy then goes on to identify key priority measures and strategic packages for the D2N2 area which will enable the economic growth of the area. Whilst no key transport priorities for D2N2 focus on trans-Pennine routes, focussing more so on north-south and eastern connectivity, there is a commitment to working with DfT and HA as part of the trans-Pennine study, covering the highly congested A628 and other routes through the Peak area.

6.4 Strategic Growth Proposals

6.4.1 The Route Strategy and Strategic Economic Plans highlight the overall strategic growth proposals for the Greater Manchester and SCR and the D2N2 area. These proposals show very significant plans for both regions. The Cheshire and Warrington area has also been included in the table below. However, the impact of these growth proposals are less likely to have a significant impact on the trans-Pennine routes as much of the growth will be outside of the main travel market.

Figure 6-1 – Strategic Growth Proposals



6.4.2 By 2020, Greater Manchester has planned growth of 67,000 homes and 80,000 new jobs, with a further 43,700 homes and 70,000 jobs, and 77,000 homes and 55,000 jobs in the SCR (by 2024) and the D2N2 region (by 2023) respectively. This amounts to a total of at least 187,700 homes and 205,000 jobs across the three city regions by 2024.

Table 6-1 – Strategic Growth Proposals

Area	Target Year	New Homes	New Jobs	Priority Area for Regeneration	City Deal	Enterprise Zone
Greater Manchester	2020	67,000	80,000	Yes	Yes	Yes
Sheffield City Region	2024	43,700	70,000	Yes	Yes	Yes
D2N2	2023	77,000	55,000	Yes	Yes	Yes
Cheshire and Warrington	2021	34,500	60,000	Yes	No	Yes

Source: South Pennine Route Strategy and Strategic Economic Plans for Greater Manchester, Sheffield, D2N2 and Cheshire & Warrington

The Greater Manchester, Sheffield and D2N2 city regions have identified combined plans for at least 187,700 new homes and 205,000 new jobs by 2024.

6.5 Future Land Uses and Policies

- 6.5.1 This section provides details of the future development proposals that could have an impact on the trans-Pennine routes. This information has been fed into this report from the work on the Route Strategy but also from an analysis of local planning documents and discussions with local authorities.
- 6.5.2 The Route Strategy report identified a number of key strategic developments, including the nature, scale and timing of the proposals that could impact on the South Pennines corridor. There are significant numbers of strategic development proposals within the area of the South Pennines route that are likely to impact upon it. The table below gives an indication of the approximate scale and type of strategic development along the South Pennines route, along with the anticipated location of impact in the area.
- 6.5.3 It should be noted that whilst the table below shows that the anticipated location of impact of the listed developments does not include any routes within the scope of this feasibility study, they are within the wider travel market associated with those routes.

Table 6-2 – Key Housing and Economic Growth Proposals

Location of Development	Development Type	Anticipated growth			Anticipated Location of Impact on Route
		2011-2015	to 2021	to 2031	
Manchester Airport & Airport City Enterprise Zone	Commercial		7,000 jobs	11,500 jobs	M56 J5 & J6
Manchester Regional Centre	Commercial		15,000 jobs	50,000 jobs	M60, M602, M62, A663, M56
	Residential	11,000 homes	29,500 homes	55,000 homes	
Port Salford	Commercial		3,800 jobs		M60 J10, M60 J11, M62 J12, M60 J9-13
Salford Quays (including Media City)	Commercial		7,000 jobs	15,500 jobs	M602, M60 J10 - 12, M62

Source: South Pennine Route Strategy

- 6.5.4 The Route-Based Strategy for South Pennines Evidence Report, produced in January 2014, provided details of the number of dwellings and jobs that are predicted, by local development areas, between 2014 and 2031. The local areas that are likely to have a significant impact on the trans-Pennine routes within this report are provided in Table 6-3 below. There are gaps in this information due to a number of local authorities having not completed their land allocation proposals.

Table 6-3 – Growth Proposals by Local Authority

Location of Development	Development Type	Scale by 2015	Scale by 2021	Scale by 2031	Anticipated Location of Impact
Barnsley	Dwellings	3,500	10,500	22,200	A61, A616, A628
	Jobs	7,400	22,100	46,600	
Cheshire East	Dwellings	No Data	No Data	No Data	A6
	Jobs	No Data	No Data	No Data	
Derbyshire Dales and High Peak	Dwellings	No Data	990	1,500	A57, A624, A6187, A6, A625 A623 A6013
	Jobs	No Data	No Data	22,500	
Manchester	Dwellings	7,300	29,300	55,000	A628, A616 A61 A57, A6,
	Jobs	4,000	15,800	29,600	
Rotherham	Dwellings	2,700	8,200	17,400	A628, A616 A61 A57, A624, A6187, A6, A625 A623 A6013
	Jobs	6,300	19,000	40,100	
Sheffield	Dwellings	10,300	30,800	65,100	A628, A616 A61 A57, A624, A6187, A6, A625 A623 A6013
	Jobs	14,100	42,300	89,300	
Stockport	Dwellings	900	3,600	8,100	A6
	Jobs	No Data	No Data	No Data	
Tameside	Dwellings	1,000	4,750	12,250	A628, A616, A57
	Jobs	No Data	No Data	No Data	
Source: South Pennine Route Strategy					

6.5.5 The growth proposals outlined in the table above, together, will have impacts across the trans-Pennine route network. Development proposals across some authorities are likely to impacts across more of the routes than others due to their relation to the individual parts of the network. Rotherham for example has a significant north-south area of coverage, meaning that access points onto the trans-Pennine routes range from the A61 and A616 in the north and the A57 and A625 in the south. The impact of new developments in Tameside, however, will largely feed into the routes from the one location, the A57.

6.5.6 In addition to the summary of proposed development outlined in the above table, the following provides a summary of specific larger development sites that may have an impact on the trans-Pennine routes. Only housing sites larger than 50 dwellings or two hectares and employment sites over one hectare have been included in this analysis.

Table 6-4 – Proposals along HA route: A57 / A628 / A616 / A61

Local Authority	Development Site	Residential (Dwellings)	Commercial	Anticipated Location of Impact on Route
Tameside	Site Allocations Development Plan Document will follow in Spring 2014			
High Peak	North Road, Glossop	60	-	A628 / A57 junction, Hollingworth, A628 / New Road junction, Tintwistle, A628 / B6015 junction
	Land off Woodhead Road, Glossop	101	-	A628 / A57 junction, Hollingworth, A628 / B6015 junction
	Woods Mill, High St East, Glossop	104	-	A628 / A57 junction, Hollingworth, A628 / B6015 junction
	Dinting Road / Dinting Lane, Glossop	77	-	A628 / A57 junction, Hollingworth
	Dinting Lane, Glossop	50	-	A628 / A57 junction, Hollingworth
	Former Dinting railway museum, Dinting Road, Glossop	89	-	A628 / A57 junction, Hollingworth
	Charlestown Works, Glossop	76	-	A628 / A57 junction, Hollingworth, A628 / B6015 junction
	Adderley Place, Glossop	130	-	A628 / A57 junction, Hollingworth
	Roughfields, Hadfield	102	-	A628 / A57 junction, Hollingworth
	Waterside, Hadfield	-	1.6ha	A628 / A57 junction, Hollingworth, A628 / New Road, Tintwistle
Land off Wren Nest Road, Glossop	-	2.5ha	A628 / A57 junction, Hollingworth, A628 / B6015 junction	
Barnsley	Land East of Cote Lane, Thurgoland	58	-	A616 / A629 junction
	Land North & South of Roughbitchworth Lane, Oxspring.	111	-	A616 / A629 junction
	Land South of Lidget Lane, Pilley	103	-	A61 / M1 junction, A61 / A616 junction
	Greenside Lane, Hoyland, Barnsley	68	-	A61 / A6195 / M1 junction
	Land off Clough Field Lane, Hoyland	103	-	A61 / A6195 / M1 junction

Local Authority	Development Site	Residential (Dwellings)	Commercial	Anticipated Location of Impact on Route
	Land off Meadowfield Drive, Hoyland	83	-	A61 / A6195 / M1 junction
	Land North of Railway Station, King Street, Hoyland	76	-	A61 / A6195 / M1 junction
	Site North of Hoyland Road, Hoyland Common	677	-	A61 / A6195 / M1 junction
	Land North of Stead Lane, Hoyland	876	-	A61 / A6195 / M1 junction
	Land North of Armroyd Lane, Hoyland	693	-	A61 / A6195 / M1 junction
	Land South of Hay Green Lane, Birdwell, Hoyland	157	-	A61 / A6195 / M1 junction
	Land at Talbot Road, Penistone	80	-	A616 / A629 junction, A628 / A616 junction
	Land West of Talbot Road, Penistone	50	-	A616 / A629 junction, A628 / A616 junction
	Land East of Saunderson Avenue, Penistone	53	-	A616 / A629 junction, A628 / A616 junction
	Site East of Mortimer Road, Cubley, Penistone	210	-	A616 / A629 junction, A628 / A616 junction
	Site South East of Schole Hill Lane, Penistone	185	-	A616 / A629 junction, A628 / A616 junction
	Site South of New Smithy Drive, Thurlstone, Penistone	87	-	A616 / A629 junction, A628 / A616 junction
	Land West of Church Heights, Hoylandswaine	68	-	A616 / A629 junction, A628 / A616 junction
	Wentworth Industrial Park, Tankersley	-	4.35ha	A61 / M1 junction, A61 / A616 junction
	Land South of Sheffield Road, Penistone	-	1.29ha	A616 / A629 junction, A628 / A616 junction
	Land North of Sheffield Road, Penistone	-	3.27ha	A616 / A629 junction, A628 / A616 junction
	Land West of Sheffield Road, Hoyland	-	47.92ha	A61 / A6195 / M1 junction
	Rockingham, Hoyland	-	18.76ha	A61 / A6195 / M1 junction
	Shortwood Extension,	-	11.81ha	A61 / A6195 / M1

Local Authority	Development Site	Residential (Dwellings)	Commercial	Anticipated Location of Impact on Route
	Hoyland			junction
	Shortwood Business Park, Hoyland	-	7.06ha	A61 / A6195 / M1 junction
	Land South of Dearne Valley Parkway, Hoyland	-	38.2ha	A61 / A6195 / M1 junction
	Land North of Dearne Valley Parkway, Hoyland	-	44.13ha	A61 / A6195 / M1 junction
	Ashroyds, Hoyland	-	11.37ha	A61 / A6195 / M1 junction
Sheffield	Site A Stocksbridge Steelworks, off Manchester Road, Stocksbridge	202	-	A616 / B6088 junction, A616 / A6102 junction
	Ford Lane, Stocksbridge	140	-	A616 / B6088 junction, A616 / A6102 junction
	Hawthorn Avenue/ Coppice Close, Stocksbridge	44	-	A616 / B6088 junction, A616 / A6102 junction
	Sweeney House, Alpine Close, Stocksbridge	18	-	A616 / B6088 junction, A616 / A6102 junction
	Balfour House, Horner Close, Stocksbridge	0.73ha	-	A616 / B6088 junction, A616 / A6102 junction
	Newton Grange, Manchester Road, Stocksbridge	55	-	A616 / B6088 junction, A616 / A6102 junction
	Outokumpu site, off Manchester Road, Stocksbridge	-	5.75ha	A616 / B6088 junction, A616 / A6102 junction
	Site G Stocksbridge Steelworks, off Manchester Road, Stocksbridge	11	-	A616 / B6088 junction, A616 / A6102 junction
	Former Steins Tip, Station Road, Deepcar	24.65ha	-	A616 / B6088 junction, A616 / A6102 junction
	Former Occupational Training Centre, Westwood Road, High Green	23	-	A616 / A61 junction
	South Yorkshire Trading Standards Unit site, Thorncliffe Lane,	24	-	A616 / A61 junction

Local Authority	Development Site	Residential (Dwellings)	Commercial	Anticipated Location of Impact on Route
	High Green			
	Kenworthy Road, Stocksbridge	10	-	A616 / B6088 junction, A616 / A6102 junction
	Site of 798 Manchester Road, Stocksbridge, Sheffield, S36 1EA	12	-	A616 / B6088 junction, A616 / A6102 junction
	Former Springfield Reservoir, Whitwell Lane, Stocksbridge	15	-	A616 / B6088 junction, A616 / A6102 junction
	Site D Stocksbridge Steelworks, off Manchester Road, Stocksbridge	26	-	A616 / B6088 junction, A616 / A6102 junction
	Sewage works, Manchester Road, Deepcar	118	-	A616 / B6088 junction, A616 / A6102 junction
	Station Road / Manchester Road, Deepcar	-	1.38ha	A616 / B6088 junction, A616 / A6102 junction
	Thornccliffe Park Estate, Newton Chambers Road, Chapeltown	-	2.44ha	A616 / A61
	Corus And Outokumpu Works, Ford Lane / Manchester Road / Hunshelf Road	-	9.37ha	A616 / A61
Source: Local Plans/Core Strategies and Land Allocations				

- 6.5.7 It is clear from the above table that there are a number of sites allocated for housing or employment use in the High Peak, Barnsley and Sheffield areas, though many of these are relatively small in scale.
- 6.5.8 Glossop is a focus for significant development and the transport impact of proposals have been assessed by the High Peak Local Plan Transport Study. This has shown that the A57 (non-trunk) will be impacted by these proposals. However, the study suggests that the Glossop Spur, or equivalent scheme, will be required to resolve congestion in the Woolley Bridge area.
- 6.5.9 Barnsley Council has specifically highlighted the employment developments at Junctions 36 and 37 of the M1, which link to the A616 and A628 (non-trunk) as being particularly important, and requiring good access to Greater Manchester.
- 6.5.10 South Yorkshire Passenger Transport Executive has highlighted a range of developments across the sub-region that could have an impact on travel demand including the following:

- The new retail core in Sheffield city centre including significant additional office accommodation;
- Advance Manufacturing Park;
- Regeneration of Penistone including 1,000 houses;
- Stockbridge and Deepcar employment and housing proposals; and,
- Doncaster Inland Port.

6.5.11 Data for Tameside is unavailable, with the Site Allocations Development Plan Document currently being prepared. However, Tameside Council has identified a potential development site on the A57, at its junction with the M67. This site, of 35ha, would be developed for employment with potential for research, general and light industry, or distribution. In its Local Plan Preferred Options Report, the Council highlights highway capacity as a weakness for the site.

Table 6-5 – Proposals along route: A57 / A6013 / A6187 / A625

Local Authority	Development Site	Residential (Dwellings)	Commercial	Anticipated Location of Impact on Route
Tameside	Site Allocations Development Plan Document will follow in Spring 2014			
High Peak	See sites listed in Table 6-4			
Derbyshire Dales	No allocations in vicinity of study area			
Sheffield	Holiday Inn, Manchester Road, Broomhall	1.32ha	-	A57
	Former Tapton Hall of Residence, Crookes Road, Broomhall	2.59ha	-	Crookes Road / A57 junction
	Former British Glass Laboratories, Northumberland Road, Crookesmoor	0.42ha	-	Northumberland Road / A57 junction
	Sheffield Hallam University Campus, Psalter Lane, Nether Edge	2.07ha	-	A625
	Gilders Car Showroom site, Ecclesall Road, Banner Cross	0.50ha	-	A625
	Canterbury Crescent, Fulwood	0.70ha	-	A57, A625
	Development at Industry Works, Site B, Sylvester Gardens, Sheffield S1 4RP	64	-	A625
	Development at	96	-	A625

Local Authority	Development Site	Residential (Dwellings)	Commercial	Anticipated Location of Impact on Route
	Bernard Works Site, Sylvester Gardens, Sheffield S1 4RP			
	Former Nursery School, Denby Street	100	-	A625
	75 Milton Street, 83 Headford Street and Land at Milton Lane, Thomas Street and Hodgson Street, Sheffield, S3 7WG	191	-	A625
	Land at Young Street and St Marys Gate, Sheffield	281	-	A625
	Land Opposite 134 to 180 St Georges Close Sheffield	102	-	A57
	Land At Napier Street Site Of 1 Pomona Street And Summerfield St. Former Gordon Lamb	175	-	A625
	Headford Street/Egerton Street	54	-	A625
	Waitrose Supermarket, 123 Ecclesall Road, Sheffield, S11 8HY	62	-	A625
	St. Phillip's Social Club, Radford Street / Daisy Walk	135	-	A57
	Bannerdale Centre & Park Site, Cater Knowle Road	57	-	A625
	Former British Glass Laboratories Northumberland Road	76	-	A57
	Land And Buildings At Boston Street Bramall Lane And Arley Street Boston Street Sheffield	57	-	A625
	Holiday Inn, Manchester Road	133	-	A57
	Site of King Ecberts Upper School, Furniss Avenue, Dore	65	-	A625
	Sheffield Hallam University Campus, Psalter Lane	62	-	A625

Local Authority	Development Site	Residential (Dwellings)	Commercial	Anticipated Location of Impact on Route
Source: Local Plans/Core Strategies and Land Allocations				

6.5.12 The exercise has been repeated for the central trans-Pennine route, as shown in the table above. The sites listed in Table 6-6 for the Glossopdale area of the High Peak are also applicable to this route due to the A57 passing through Glossop. There are a number of sites identified in the Sheffield area, along the A57 and A625, though these are relatively small in scale and are therefore unlikely to have a major traffic impact on the route. Data for Tameside is unavailable, whilst there are no site allocations in the vicinity of the route when examining the Derbyshire Dales area.

Table 6-6 – Proposals along routes: A624 / A6 / A623

Local Authority	Development Site	Residential (Dwellings)	Commercial	Anticipated Location of Impact on Route
Stockport	Site Allocations Development Plan Document is currently being prepared			
Cheshire East	Site Allocations Development Plan Document is currently being prepared			
Sheffield	Derby Road, New Mills	170	-	A6 / A6015 junction, A624 / A6015 junction
	Ollersett Lane / Pingot Road, New Mills	146	-	A6 / A6015 junction, A624 / A6015 junction
	Laneside Road, New Mills	78	-	A6 / A6015 junction, A624 / A6015 junction
	Britannia Mill	50	-	A624 / B6062 junction, A6 / B6062 junction, A6 / A624 junction
Derbyshire Dales	No allocations in vicinity of study area			
Source: Local Plans/Core Strategies and Land Allocations				

6.5.13 The exercise has been repeated for the southern trans-Pennine route, as shown in the table above. Data is unavailable for Stockport and Cheshire East due to the incomplete status of their respective Site Allocations Development Plan Documents. There are a number of sites identified in the central High Peak area, in the vicinity of the A624 and A6, including several residential sites in the New Mills area, which may have a traffic impact on this route should they be brought forward. No site allocations in the vicinity of the route have been identified in the Derbyshire Dales area, with the A623 passing through a predominantly rural area.

6.6 Future Changes to the Transport System

6.6.1 This section sets out proposed and potential changes to the transport system that could influence connectivity across the trans-Pennine routes.

- 6.6.2 The table below identifies the committed improvements to the Strategic Road Network managed by the HA. These two schemes will affect the operation and capacity of the routes, with the A61 Westwood Roundabout improvement being on the HA's route and will reduce delays currently experienced at the A61/A616 junction. The M60 J24 Pinch-Point scheme is not directly on the trans-Pennine routes but will improve onward journeys for trans-Pennine movements using the A57.

Table 6-7 – Committed Changes to the Strategic Road Network

Route	Scheme	Description	Completion
A616/A61	A61 Westwood Roundabout (LNMS)	This is a committed scheme in the Local Network Management Scheme (LNMS) programme, being carried out by the HA at the roundabout junction of A61/A616 at the eastern end of the route. The scheme involves reconfiguring the roundabout to provide a hamburger arrangement which will address congestion issues experienced at this location. The scheme will be delivered during 2014/15 and 2015/16, and preparatory works are currently underway	2015/16
M60 J24 Denton (M60/M67)	Pinch-Point	Congestion reduction and improved journey time reliability to support growth in south and east of the Greater Manchester conurbation.	2015

Source: Highways Agency

- 6.6.3 The following table identifies a declared pipeline scheme for the Strategic Road Network. Again, this scheme is not on the trans-Pennine routes directly but would improve some journeys using the A57.

Table 6-8 – Declared Strategic Road Network Pipeline Schemes

Route	Scheme	Description
M60 J24 to 27	Smart Motorways	Congestion reduction and improved journey time reliability to support growth along the route and throughout the north of England.

Source: Highways Agency

- 6.6.4 The following tables provide details of committed local road and rail network improvements respectively that may improve connectivity across the trans-Pennine routes or may influence movements on them.

Table 6-9 – Committed Wider Highway Network Improvements

Network	Route	Scheme	Description	Completion
Local Road	A57	Hyde Road Widening – Local Pinchpoint Scheme	Reducing the queue on this section of the local road network should help egress for Manchester bound traffic from M60 J24 roundabout	2015

Network	Route	Scheme	Description	Completion
Local Road	A6	A6 to Manchester Airport Relief Road	Road scheme, connecting the A6 at Hazel Grove to the Airport Link Road at A555. This scheme will provide much needed improved connectivity to and from Manchester Airport and will also relieve some capacity on the congested A6 route, improving connectivity for strategic routes in south Manchester.	2017/18
Local Road	A6	Stockport Town Centre Major Scheme	A scheme covering the whole of Stockport town centre with specific measures concentrated on the A6 corridor through the town including bus priority, pedestrian/cycle facilities, improved access to rail and bus stations, etc	2018

Sources: South Pennine Route Strategy

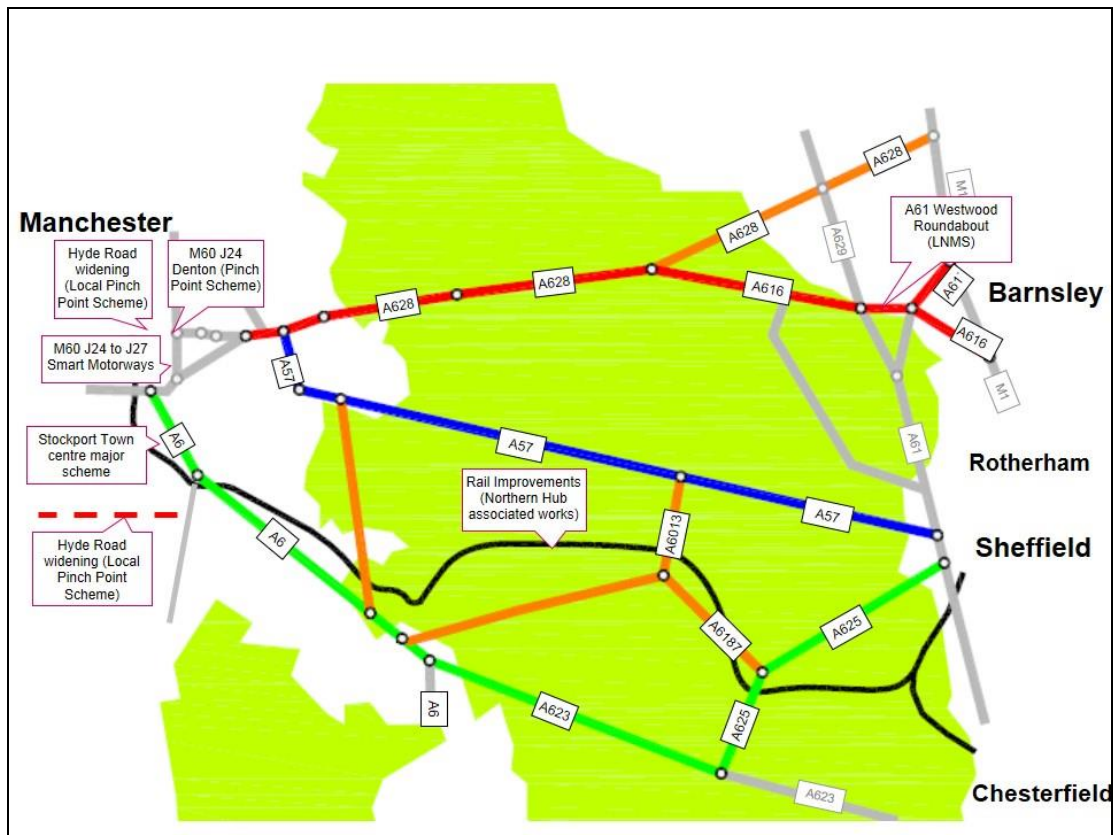
Table 6-10 – Committed Rail Network Improvements

Network	Route	Scheme	Description	Completion
Rail	Hope Valley Line	Northern Hub Rail Improvements	Limited direct impact although the increase in capacity on the rail network generated by this proposal should improve the attractiveness of rail use within the Greater Manchester conurbation. This, in turn, may contribute to a reduction in traffic growth – passing loop at Bamford, double-track at Dore junction, signal renewals	2018

Sources: Network Rail

6.6.5 The committed and pipeline schemes are shown in the figure below.

Figure 6-2 – Pipeline Schemes



6.6.6 The following table provides details of other, potential, local road and rail network improvements that may improve connectivity across the trans-Pennine routes or may influence movements on the routes.

Table 6-11 – Wider Transport Network Improvements

Network	Route	Scheme	Description	Completion
Rail	Hope Valley Line	Electrification	The Electrification Task Force is current investigating the potential for electrification of railway lines including the Hope Valley line. This could provide journey time improvements of between three and five minutes.	2025/2030
Rail	Manchester to Glossop Line	Gamesley Station	A proposal for a new railway station at Gamesley, to the north-west of Glossop	Not programmed
Road	A57	Glossop Spur	A proposal for a new link from the A57(T) to the A57 (part of the Mottram –Tintwistle Bypass Scheme	Not programmed
Rail	HS2	High Speed Rail Phase 2	Widely anticipated in the region as a catalyst for significant economic growth with improved connectivity with the south of the country and east-west across	2033

Network	Route	Scheme	Description	Completion
			the northern regions.	
Sources: Network Rail, Derbyshire County Council, HS2 Plus				

- 6.6.7 In terms of Network Rail's improvements for the Hope Valley Line, as part of the Northern Hub project, to provide a passing loop in the Bamford area and double track the Dore Junction. Along with signalling renewals, these improvements should be in place by December 2018 and would increase the number of train paths available. Improvements have already been made in the Chinley and Peak Forest areas to enable longer freight trains. The Northern Hub improvements would reduce journey times by approximately 2.5 minutes and enable the introduction of an additional fast Liverpool to Leicester service making three fast trains per hour in each direction between Manchester and Sheffield. There is also scope to provide an hourly stopping service between Manchester and Sheffield depending on demand and a strong rail industry business case, plus three to four freight trains per hour.
- 6.6.8 Early work on proposals to electrify the route is ongoing but this would not happen until Control Period 6 (2019 to 2024) at the very earliest, but more likely by 2025/2030, and there is no guarantee that this will go ahead. Electrification would enable the provision of a better quality of service, reduce operational costs and is likely to provide a journey time improvement as well as environmental benefits (reducing CO₂) between the East Midlands / East Yorkshire / South Yorkshire / Sheffield and Manchester. Modern electric trains can provide substantial journey time improvements compared to older diesel trains but these benefits cannot be quantified at the moment. The Electrification Task Force will consider this.
- 6.6.9 The North of England (Rail) Route Studies will commence in 2016 and should be completed by July 2017. These studies will develop plans for Control Period 6 between 2019 and 2024 and will look for improvements to support growth through more services and longer trains. However, it is unlikely that there will be significant changes for the Manchester to Sheffield route.
- 6.6.10 The Secretary of State for Transport has asked Network Rail to undertake a study of improved connectivity between the Midlands and the North and links to HS2 as part of Control Period 6 and this may have implications for East-West rail travel.
- 6.6.11 Network Rail is currently undertaking a study to look at how it can cater for biomass traffic from the north-west ports across the Pennines to the Yorkshire power stations and this is due to report to report in summer 2014. Network Rail is also undertaking a further study to look at northern ports and trans-Pennine freight capacity and how it can cater for freight growth across the Pennines particularly in the energy (biomass), waste and intermodal markets. This is due to report at the end of 2014/early 2015.

6.6.12 Network Rail stated that its proposals for the Hope Valley Line to increase capacity will be primarily implemented to support existing and future demand for rail travel, based on the current existing rail market, population forecasts and local authority land use plans. Only a small allowance for mode shift from road to rail for personal travel is included in the passenger forecasting, therefore, it appears that there may be limited scope within current plans for significant shifts of personal travel from the road network to the Hope Valley Line.

6.7 Future Travel Demands and Levels of Service

6.7.1 Future travel demand for the trans-Pennine road network has been forecast using outputs from TEMPRO and, for indicative purposes, existing traffic flows have been grown to 2019 and 2034 (indicative scheme years of opening and design years).

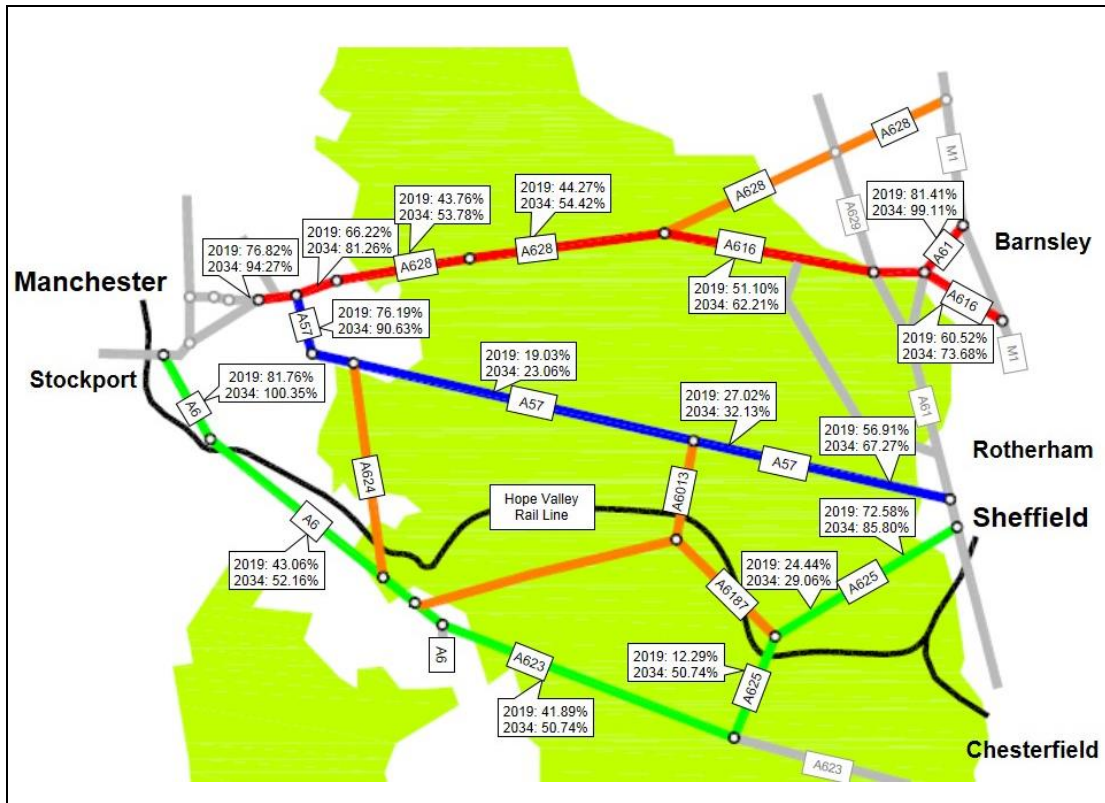
6.7.2 Depending on the individual section of the route, traffic is forecast to increase by between 7.5% and 11% to 2019 and between 28.1% and 36.5% to 2034, with the resulting AADTs shown in the following table.

Table 6-12 – Forecast Traffic Flows – AADT

Section	Current	2019	2034
<u>Strategic Road Network</u>			
1) A57 between M67 J4/A57/A560 roundabout and A57/A628 junction in Hollingworth	36,638	39,387	48,336
2) A628 between A57/A628 junction in Hollingworth and end of Tintwistle 30mph section	14,192	15,362	18,850
3) A628 between end of Tintwistle 30mph section and A628/A6024 junction	12,367	13,732	16,877
4) A628 between A628 / A6024 junction and A628 / A616 junction	12,947	14,202	17,456
5) A616 between A628 / A616 junction and A616 / A629 junction	14,368	15,646	19,047
6) A616 between A616 / A629 junction and A616 / M1 J35A	18,532	20,181	24,568
7) A61 between A61 / A616 junction and A61 / M1 J36	22,001	23,958	29,166
<u>Local Authority Roads</u>			
A57 between the A628 and Glossop	15,958	17,270	20,543
A57 between Glossop and A6013	4,082	4,454	5,395
A57 between A6013 and A6101	5,769	6,217	7,392
A57 between A6101 and Sheffield	12,358	13,407	15,848
A6 between Stockport and A523	35,035	37,924	46,546
A6 between Chapel-en-le-Frith and A623	17,084	18,642	22,581
A623 between the A6 and A625	8,602	9,387	11,370
A625 between the A623 and A6187	2,618	2,857	3,460
A625 between the A6187 and Dore	5,195	5,598	6,656
A625 between Dore and Sheffield	15,901	17,250	20,392

6.7.3 A comparison of the capacities of the highway links in the individual routes sections has been made with the forecast traffic flows and is presented in the following two tables and in the figure below.

Figure 6-3 – Comparison of Link Capacity and Forecast Traffic Flows



6.7.4 As can be seen, the Sections 1, 2 and 7 will be approaching their theoretical capacities by 2034 and this is likely to result in significant additional congestion. Furthermore, these calculations do not take account of junction capacities, and as a number of junctions are already operating above capacity in peak periods, it appears that current issues are likely to increase significantly if this predicted growth materialises.

Table 6-13 – Comparison of Link Capacity and Forecast Traffic Flows

Section	Current	2019	2034
1) A57 between M67 J4/A57/A560 roundabout and A57/A628 junction in Hollingworth	71.46%	76.82%	94.27%
2) A628 between A57/A628 junction in Hollingworth and end of Tintwistle 30mph section	61.18%	66.22%	81.26%
3) A628 between end of Tintwistle 30mph section and A628/A6024 junction	39.41%	43.76%	53.78%
4) A628 between A628 / A6024 junction and A628 / A616 junction	40.36%	44.27%	54.42%
5) A616 between A628 / A616 junction and A616 / A629	46.93%	51.10%	62.21%

Section	Current	2019	2034
junction			
6) A616 between A616 / A629 junction and A616 / M1 J35A	55.58%	60.52%	73.68%
7) A61 between A61 / A616 junction and A61 / M1 J36	74.76%	81.41%	99.11%

By 2034, the A57(T), A628 and A61 will be at or approaching their theoretical link capacities.

- 6.7.5 A comparison of the capacities and forecast traffic flows on the trans-Pennine roads operated by local highway authorities has been made and is presented in the following table. The analysis reveals that A6 within the Stockport area will exceed its theoretical capacity by 2034 and this is likely to result in significant additional congestion. In addition, it is likely that the A57 through Glossop will be approaching its theoretical capacity by 2034 resulting in congestion. However, all other links are considered to have significant spare capacity by 2034.

Table 6-14 – Comparison of Link Capacity and Forecast Traffic Flows

Section	Current	2019	2034
A57 between the A628 and Glossop	70.40%	76.19%	90.63%
A57 between Glossop and A6013	17.44%	19.03%	23.06%
A57 between A6013 and A6101	25.07%	27.02%	32.13%
A57 between A6101 and Sheffield	52.46%	56.91%	67.27%
A6 between Stockport and A523	75.53%	81.76%	100.35%
A6 between Chapel-en-le-firth and A623	39.46%	43.06%	52.16%
A623 between the A6 and A625	38.39%	41.89%	50.74%
A625 between the A623 and A6187	11.26%	12.29%	14.89%
A625 between the A6187 and Dore	22.68%	24.44%	29.06%
A625 between Dore and Sheffield	66.90%	72.58%	85.80%

By 2034, the A57 through Glossop and the A6 in Greater Manchester will be at or approaching their theoretical link capacities.

6.8 Summary

6.8.1 This section has described the current proposals for development within the trans-Pennine routes and which routes they may impact upon. The section has also outlined a number of committed and proposed transport proposals that may influence travel patterns across the Pennines. A high level analysis has been provided of the potential impact of predicted growth (taken from TEMPRO) on the trans-Pennine road network. Overall conclusions can be summarised as:

- The city regions are focussing on the need to develop greater east-west connectivity across the North of England to help establish an interconnected network of cities that can help to rebalance the national economy;
- The Strategic Economic Plans for the three city regions surround the study area have set out proposals for very significant growth in homes and employment over the coming decade and beyond;
- Individual local authorities have also identified a range of development proposals that may have an impact of the trans-Pennine route network;
- A number of committed transport proposals have been identified which could change travel patterns on trans-Pennine routes; and,
- Using analysis of link capacity and forecast growth in traffic, links within the urban areas of the trans-Pennine routes will be nearing capacity over the next 20 years.

7 Establish the Need for Intervention

7.1 Introduction

7.1.1 This section of the report summarises the need for intervention on the trans-Pennine routes based on the information reviewed in the previous sections. The key challenges facing the trans-Pennine routes are summarised and listed under the following headings:

- Connectivity – challenges faced in terms of the level of connectivity across the Pennines, particularly between Manchester and Sheffield;
- Network Operation – challenges faced in the management of the trans-Pennine routes particularly focussing on resilience of the network;
- Asset Conditions – challenges presented by the condition of the infrastructure providing the trans-Pennine routes;
- Capacity – challenges presented by constraints on the network or where current or future demand reduces the efficiency of its operation;
- Environmental – challenges presented by the network in terms of environmental impact and constraints place on the network by environmental designations.
- Safety – challenges related to the safety of people using the trans-Pennine routes; and,
- Societal – challenges focussed on the impact of the routes on local communities and vulnerable users.

7.1.2 The challenges, and where appropriate opportunities, have been identified through the review of pertinent policy and study documents, analysis of technical information and consultations with key public sector stakeholders.

7.2 Connectivity Challenges and Opportunities

7.2.1 Many of the challenges identified in the following subsections contribute to issues for the main focus of this study; connectivity.

7.2.2 The policy and strategy documents reviewed for this Stage 1 report, and the engagement undertaken with public sector stakeholders, have highlighted the importance to the economy of greater connectivity across the whole of the north, not just between Manchester and Sheffield.

7.2.3 Improvements to connectivity locally and between cities and regions are seen as fundamental to the future of the northern economies. HS2 is seen as a major opportunity and catalyst for growth and the city regions expect to see capacity on existing routes released. However, as highlighted in both the Higgins Reports and

the One North Report, further investment in east-west transport corridors in the North, including between Manchester and Sheffield, is seen as vital. Recent and ongoing joint working by the city regions points to opportunities to develop such infrastructure in a broad partnership across the north.

- 7.2.4 The Higgins Report of October 2014 highlighted other opportunities to improve east-west connectivity across the North and the Government has given its backing to 'HS3', a high speed link connecting the North's cities.
- 7.2.5 The Government also welcomed Higgins' recommendations that co-operation on transport issues should be formalised in the North by the formation of Transport for the North. It will be for Transport for the North to suggest priorities for transport schemes that will enhance connectivity and enable the Northern Powerhouse. The Government wants cities to come together and work with it on options for HS3, alongside a wider transport strategy for the North.
- 7.2.6 Connectivity to Manchester Airport is highlighted as a challenge for both the Sheffield and D2N2 city regions and the importance of these connections is likely to increase with the significant proposals for Airport City and the Enterprise Zone. Connectivity from the south of Manchester and the southern route across the Pennines will be improved by the A6 to Manchester Airport Relief Road.
- 7.2.7 The National Networks Trans-Pennine Connectivity Study highlighted significant challenges, particularly focussing on the A628, which it acknowledged was the primary route between Manchester and Sheffield. With the constraints on improvements to that route due to its passage through the National Park, the study instead focussed on rail as the appropriate mode through which to improve connectivity. The study found that limited connectivity restricts economic interactions and growth across the Pennines and wider north and leads to low levels of business to business journeys, limiting opportunities to increase economic activity. The study also found constraints to freight movements from Ports due to limited rail infrastructure.
- 7.2.8 This study has found, through a review of traffic data, that the northern route (A57/A628/A616/A61) is the primary route for trans-Pennine journeys, supported by the A57 and less so by the A625/A623/A6 southern route. Rail connectivity is restricted by the limited services (two fast and one slow trains per hour) between Manchester and Sheffield). However, proposals for improvements to the Hope Valley Line as part of the Northern Hub, and potentially electrification in the long term, are opportunities to bring improvements to connectivity.
- 7.2.9 The most significant challenges to connectivity are the journey times across the Pennines, increased by congestion at key locations, including junctions in the urban areas of the A57/A628 and on the A6 into Stockport. These issues are exacerbated by the lack of journey-time reliability generated by the frequent closure of routes due to poor weather and accidents.

7.2.10 The 2012 Trans-Pennine Connectivity Study, by Derbyshire County Council, assessed the potential economic benefits of improving connectivity between Sheffield and Manchester. It is stated that there is a general acceptance that poor connectivity between the two city regions is currently suppressing economic activity. The report identifies agglomeration as the most important of the wider impacts of transport improvements and acknowledges that transport schemes improving linkages between cities show good wider economic benefits.

7.2.11 Given the make-up of the economies of Sheffield and Manchester city regions, improved connectivity would bring benefits to both cities. The study concluded that there is a strong theoretical case for transport projects that will improve the connectivity between Sheffield and Manchester city regions to provide wider economic benefits.

7.3 Operational Challenges and Opportunities

7.3.1 The trans-Pennine routes face a number of operational challenges and these are primarily focussed on road closures, maintenance, availability of technology and alternative routes.

7.3.2 The HA's A57/A628/A616/A61 strategic route experiences a road closure every 11 days on average with two third of these being longer than two hours. Some 36% of road closures are longer than five hours, equating to one road closure of five hours or more every month. Some 77% of these closures are the result of either road traffic collisions or bad weather.

7.3.3 Weather-related closures are not restricted to the HA route and both Derbyshire County Council and Sheffield City Council have confirmed that their routes are susceptible to weather-related closures. The A57 has been identified as the local authority route at greatest risk of weather-related closures.

7.3.4 Maintenance operations present an operational challenge due to the majority of the trans-Pennine routes being single carriageway. Maintenance operations on single-carriageways can reduce operation to one lane, reducing the capacity of the route and causing significant delays on the busiest sections of route. The HA currently programme significant maintenance activities to occur during a series of overnight full closures to reduce the impact on operations.

7.3.5 The trans-Pennine routes currently lack significant technology systems, including on the HA's routes. This reduces the ability of the HA and local authorities to manage incidents on the routes and provide information to travellers.

7.3.6 Alternatives to individual routes across the Pennines are frequently impacted by similar challenges, such as weather-related closures, or require significant diversions (e.g. via the M62). High Peak Council has highlighted the significant impact that closures of the A628 and A616 can have on the A57, particularly through the Glossop area.

7.4 Asset Condition Challenges and Opportunities

- 7.4.1 The condition of the highways assets presents some significant challenges within the trans-Pennine routes network both on the HA's routes and the local authority roads.
- 7.4.2 Much of the A57/A628/A616/A61 route was constructed prior to being managed by the HA and is therefore constructed to a lower standard and is prone to requiring deep structural repairs, which could have significant impacts on network operation.
- 7.4.3 The vertical and horizontal alignment of the A628 has led to numerous parapet strikes, requiring temporary concrete barrier installation and repair works. The A628 also has a large proportion of the retaining walls that have current or repaired sections of impact damage. This is an ongoing issue with impacts occurring on a regular basis.
- 7.4.4 High rainfall in the area is channelled beneath the A628 in substandard culverts. Surface water runoff is thought to be the cause of many of the earthwork defects recorded. Following several landslip incidents along the A628 in recent years, a geotechnical study is currently underway, covering a 12.5 mile stretch of the A628 between Tintwistle and Chapel Brow. Derbyshire County Council has stated that the A57 is subject to significant risk of land slippage which can result in road closures and resulting impacts on connectivity.
- 7.4.5 Consultations with Derbyshire County Council have revealed that there are significant retaining walls on the A6 which represent a significant ongoing maintenance liability and work has recently been completed on sections of the route outside of the trans-Pennine sections.

7.5 Capacity Challenges and Opportunities

- 7.5.1 While current traffic flows on the trans-Pennine routes appear to be within the theoretical capacity of the individual highway links, significant delays are caused by a number of junctions, the most notable being those on the HA's route in the urban areas of the A57, particularly the A57/B6174 junction, and the A616/A61 junction at the eastern end of the route.
- 7.5.2 On the local road network, the A57 north of Glossop suffers from congestion, particularly at its junction with Woolley Bridge Road and the A628. A recent study has also revealed that the urban section of the A6 heading into Stockport suffers from severe network stress.
- 7.5.3 Parked cars in the built up areas and slower moving vehicles, with speeds reduced further by significant gradients and horizontal alignment, cause delays to traffic, particularly where opportunities to pass are limited. However, junctions are the primary cause of delays on the routes.
- 7.5.4 While the current traffic flows between junctions are within the designed capacity of the road and the A57 and the A6 are likely to be operating close to their link capacity

in 20 years' time, as will the A625 into Sheffield. The performance of those junctions identified above will also deteriorate further if no improvements are made.

- 7.5.5 The city regions, with their component local authorities, have very significant plans for growth in houses and employment over the coming decade and beyond, with 222,000 homes and 265,000 jobs planned for the early 2020s. This level of development is likely to increase demand for travel across the Pennines. The majority of development will occur on the two sides of the Pennines, rather than alongside the individual trans-Pennine routes. However, developments at Glossop, Mottram and close to Barnsley have been highlighted by the respective local authorities as either being reliant on improved connectivity or capacity, or will have significant impacts on the road network.

7.6 Environmental Challenges and Opportunities

- 7.6.1 The environmental challenges within the trans-Pennine area are widespread and significant. The majority of trans-Pennine routes pass through the Peak District National Park, which presents significant constraints on improvements. The HA's A57/A628/A616/A61 route is also constrained by six Special Landscape Area designations, seven scheduled monuments, a Special Protection Area, a Special Area for Conservation, three Sites of Special Scientific Interest and six HA Flood Hot spots.
- 7.6.2 The HA's route contributes to nine Defra Important Areas for Noise, including one encompassing the A57. The route also passes through four Air Quality Management Areas.
- 7.6.3 The majority of the local authority roads also pass through the National Park, while A6, A57 and A625 pass through Air Quality Management Areas and the same roads, plus the A628, have Important Areas for Noise.

7.7 Safety Challenges and Opportunities

- 7.7.1 Accidents are identified as a significant challenge for trans-Pennine routes and lead to issues for journey-time reliability and maintenance. Detailed analysis has been undertaken of the HA's route and has revealed that sections of the A628, A616 and A61 have personal injury accident rates above the national average. The A628, along with the A61, suffers from a high proportion of accidents during severe weather conditions, while also experiencing a higher than average accidents for accidents at night. The A628 also experiences a high number of pedestrian accidents within the urban section through Tintwistle at its western end.
- 7.7.2 Accidents are primarily focussed at junctions, with a number of clusters on the HA's route but also on the non-trunk A57.
- 7.7.3 Elsewhere, on the local highway network, Derbyshire County Council has a general concern over accidents on trans-Pennine routes, particularly in relation to leisure motorcycling.

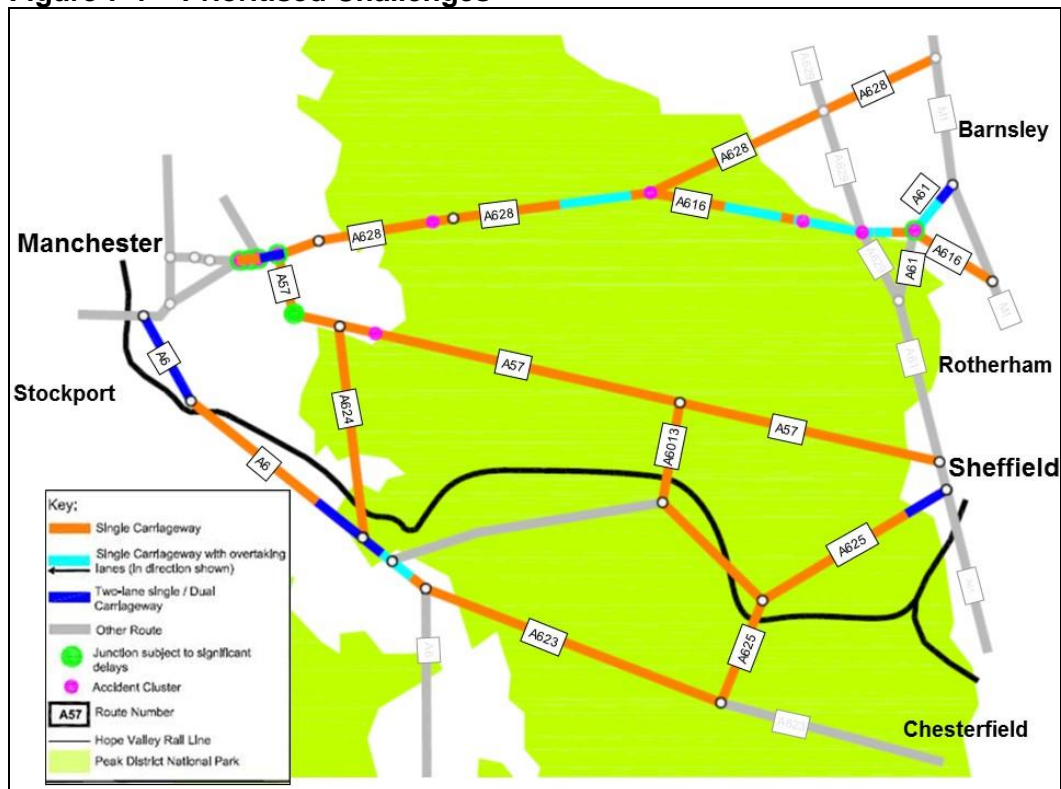
7.8 Social Challenges and Opportunities

- 7.8.1 The social challenges within the trans-Pennine routes primarily focus on severance. The South Pennines Route Strategy highlights the A628 in Hollingworth and Tintwistle as presenting particular severance issues due to the close proximity of properties to the road and the existence of numerous pedestrian desire lines. The report also highlights the significant proportion of pedestrian-related accidents.
- 7.8.2 The A6 Corridor Study also highlighted severance issues, particularly focussing on the section of the A6 between High Lane and Newtown. In addition stakeholders have highlighted more limited severance issues on the A57 in Glossop and on the non-trunk A628 in Millhouse Green and at the Penistone Grammar School.

7.9 Prioritisation of Challenges

The challenges identified above have been prioritised to ensure that the next stages focus on the most important problems faced by the trans-Pennine routes. An assessment has been made on the basis of whether the challenges have a direct impact on connectivity between Manchester and Sheffield. Those that do have an impact on connectivity have been identified as being high priority. The following is a summary of the high priority challenges; these are also presented in the figure below.

Figure 7-1 – Prioritised Challenges



- **Journey-times are increased by delays at junctions and the geometry and topography of routes**

The priority locations for delays have been identified as the junctions on the A57 (A67/A67, A57/B6174, A57/A6018 and A57/A628), the A616/A61 and A616/Thornccliffe Road junctions, the non-trunk A57 at Woolley Bridge Road and the A6 within the urban area of Greater Manchester. In addition, the topography and geometry of roads across the trans-Pennine network will lead to delays caused by slower moving vehicles.

- **Long term traffic growth will bring some urban sections of routes to their capacity.**

High level analysis of link capacity has shown that the A57 and A625 will be approaching their link capacities by 2031. The A6 is already under severe network stress.

- **Accidents reduce journey time reliability, with high accident rates on some routes and a number of accident clusters**

This challenge applies across the trans-Pennine road network due to the prevalence of single-carriageways which affects reliability when accidents occur. High personal injury accident rates have been identified on the A628, A616 and A61. Personal injury accident clusters have been identified on the A57, A628, A616, A61 and the non-trunk A57.

- **Severe weather causes road closures which reduce journey time reliability**

This challenge applies across the trans-Pennine road network, however, the A628, A616 and non-trunk A57 have been identified as the priority locations.

- **Maintenance on single carriageway sections reduces journey-time reliability**

This challenge applies across the trans-Pennine road network due to the prevalence of single-carriageways.

- **Asset condition, including the standard, age and damage to infrastructure, reduce journey-time reliability through significant maintenance operations and risk from closures**

Priority locations for this challenge have been identified as A57, A628, A616, A61, A6 and the non-trunk A57.

- **There is a lack of technology to assist in the operation and management of the routes and provide information for travellers**

This challenge applies across the trans-Pennine road network.

8 Intervention Objectives

8.1 Approach

- 8.1.1 The definition of objectives plays a key role in steering the development of transport schemes and assessing whether they have been successful once delivered. Essentially, objectives set out what a scheme, or indeed transport strategy, is designed to achieve.
- 8.1.2 The development of objectives for this project has been informed by Transport Appraisal Process guidance from WebTAG.
- 8.1.3 What a scheme should achieve can be expressed at a very high level, in terms of an aim and strategic objectives, or in much more detail including very specific objectives associated with detailed problems and issues. At this stage of the scheme development process, objectives should be higher level, avoiding indications of preferred solutions but enabling more specific objectives to be developed as the project proceeds and options identified. Objectives at this stage should also be consistent with specific challenges identified.
- 8.1.4 Objectives should be based on a realistic understanding of the issues and context of a project, reflecting the opportunities and constraints identified. While objectives should be consistent with wider local, regional and national objectives, they should focus on addressing identified need rather than seeking to contribute to all these higher level objectives. Where appropriate, objectives may focus on the five 'cases' used to development business cases (strategic, economic, financial, management and commercial).
- 8.1.5 A single set of objectives were established for the trans-Pennine Routes and they are of equal value and no weighting has been applied.

8.2 Specific Objectives

- 8.2.1 The following objectives have been developed for the trans-Pennine routes:
- **Connectivity** – improving the connectivity between Manchester and Sheffield through reduction in journey times and improved journey-time reliability;
 - **Environmental** – avoiding unacceptable impacts on the natural environment and landscape in the Peak District National Park, and optimising environmental opportunities;
 - **Societal** – improving air quality and reducing noise impacts, and addressing the levels of severance on the trans-Pennine routes in urban areas;
 - **Capacity** – reducing delays and queues that occur during peak hours and improving the performance of junctions on the routes;

- **Resilience** – improving the resilience of the routes through reductions in the number of incidents and reduction of their impacts; and,
- **Safety** – reductions in the number of accidents and reductions in their impacts.

9 Geographic Area of Interest

9.1 Geographic Scope

- 9.1.1 As stated previously in this report, the geographic scope of the study considers the current trans-Pennine road and rail routes which include the A57, A628, A616 and A61 in terms of the strategic road network, as well as the A57, A6, A623, A624, A625 and A6187 on the local authority road network. The A6013 is also considered by the study as it provides a link between the A6187 and A57 which could be used for strategic movements. The study also includes the Hope Valley railway line.
- 9.1.2 WebTAG guidance sets out that the geographic area of interest for a study should be based on. It states that this should be based on:
- An understanding of the geographical scope of the travel market and key origins and destinations (Steps 1 and 2); and,
 - An analysis of the geographical extent of current and future transport problems and underlying drivers (Step 3).
- 9.1.3 In terms of Steps 1 and 2, this study is primarily focussed on connectivity between the Manchester and Sheffield, therefore, the travel market and the key origins and destinations can be defined as the Manchester and Sheffield conurbations and the regional centres in particular. Furthermore, as the main international air hub in the north, Manchester Airport is also a key destination. At a more local level, the travel market also includes the towns and villages linked by the trans-Pennine road and rail network including Glossop, Mottram-in-Longdendale, Hollingworth, Tintwistle, Stocksbridge, Penistone, Chapel-en-le-Frith, New Mills, Hazel Grove, Castleton, Hathersage and Grindleford.
- 9.1.4 With regard to Step 3, the geographical extent of current and future transport problems lie in a much more focussed area on and immediately adjacent to the trans-Pennine road and rail network. However, the drivers for some problems lie within the wider travel market (e.g. demand for travel which results in congestion), therefore, again, the geographical scope needs to include the Manchester and Sheffield conurbations, Manchester Airport and the towns and villages in the Pennine area.

10 Findings and Conclusions

- 10.1.1 This report is the output from Stage 1 of the trans-Pennine Routes Feasibility Study. Stage 1 has involved a process to review pertinent information and documentation, including current policies and previous strategies, to assess the performance of the trans-Pennine routes. The process has also included discussions with a number of public sector stakeholder organisations to ascertain views on the evidence base and identify key challenges.
- 10.1.2 This Stage 1 report has highlighted the importance to the economy of greater connectivity across the whole of the north, not just between Manchester and Sheffield. Improvements to connectivity locally and between cities and regions are seen as fundamental to the future of the northern economies. HS2 is seen as a major opportunity and catalyst for growth and the city regions expect to see capacity on existing routes released. However, as highlighted in both the Higgins Reports and the One North Report, further investment in east-west transport corridors in the North, including between Manchester and Sheffield, is seen as vital. The Higgins Report of October 2014 also highlighted other opportunities to improve east-west connectivity across the North and the Government has given its backing to 'HS3', a high speed link connecting the North's cities.
- 10.1.3 The most significant challenges to connectivity between Manchester and Sheffield are the journey times across the Pennines, increased by congestion at key locations, including junctions in the urban areas of the A57/A628 and on the A6 into Stockport. These issues are exacerbated by the lack of journey-time reliability generated by the frequent closure of routes due to poor weather and accidents.
- 10.1.4 Rail connectivity is restricted by the limited services (two fast and one slow trains per hour) between Manchester and Sheffield). However, proposals for improvements to the Hope Valley Line as part of the Northern Hub, and potentially electrification in the long term, are opportunities to bring improvements to connectivity.
- 10.1.5 The trans-Pennine routes face a number of operational challenges. The HA's A57/A628/A616/A61 strategic route experiences a road closure every 11 days on average with two third of these being longer than two hours and some 77% of these closures are the result of either road traffic collisions or bad weather. The non-trunk routes are also prone to weather-related closures.
- 10.1.6 Maintenance presents an operational challenge due to the majority of the trans-Pennine routes being single carriageway, resulting in one lane operation, reducing the capacity of the route and causing significant delays on the busiest sections of route. Furthermore, the trans-Pennine routes currently lack significant technology systems, including on the HA's routes. This reduces the ability of the HA and local authorities to manage incidents on the routes and provide information to travellers.
- 10.1.7 The condition of the highways assets presents some significant challenges within the trans-Pennine routes network both on the HA's routes and the local authority roads.

Much of the A57/A628/A616/A61 route was constructed prior to being managed by the HA and is therefore constructed to a lower standard and is prone to requiring deep structural repairs, which could have significant impacts on network operation. There are also significant challenges related to maintenance of retaining walls, damage from accidents, drainage-related earthworks defects and risk of land slippage.

- 10.1.8 While current traffic flows on the trans-Pennine routes appear to be within the theoretical capacity of the individual highway links, significant delays are caused by a number of junctions, the most notable being those on the HA's route in the urban areas of the A57, particularly the A57/B6174 junction, and the A616/A61 junction at the eastern end of the route. On the local road network, the A57 north of Glossop suffers from congestion, particularly at its junction with Woolley Bridge Road and the A628. A recent study has also revealed that the urban section of the A6 heading into Stockport suffers from severe network stress.
- 10.1.9 Parked cars in the built up areas and slower moving vehicles, with speeds reduced further by significant gradients and horizontal alignment, cause delays to traffic, particularly where opportunities to pass are limited. However, junctions are the primary cause of delays on the routes.
- 10.1.10 While the current traffic flows between junctions are within the designed capacity of the road and the A57 and the A6 are likely to be operating close to their link capacity in 20 years' time, as will the A625 into Sheffield. The performance of those junctions identified above will also deteriorate further if no improvements are made.
- 10.1.11 The environmental challenges within the trans-Pennine area are widespread and significant. The majority of trans-Pennine routes pass through the Peak District National Park, while HA's route is also constrained by a number of landscape and conservation designations, as well as nine Defra Important Areas for Noise and four Air Quality Management Areas. The majority of the local authority roads also pass through the National Park, while A6, A57 and A625 pass through Air Quality Management Areas and the same roads, plus the A628, have Important Areas for Noise.
- 10.1.12 Accidents are identified as a significant challenge for trans-Pennine routes and lead to issues for journey-time reliability and maintenance. Analysis of the HA's route and has revealed that sections of the A628, A616 and A61 have personal injury accident rates above the national average. The A628, along with the A61, suffers from a high proportion of accidents during severe weather conditions, while also experiencing a higher than average accidents for accidents at night. The A628 also experiences a high number of pedestrian accidents within the urban section through Tintwistle at its western end. Accidents are primarily focussed at junctions, with a number of clusters on the HA's route but also on the non-trunk A57.
- 10.1.13 The social challenges within the trans-Pennine routes primarily focus on severance where major routes interact with urban areas and the resulting increased levels of pedestrian activity.

10.1.14 The main output from this stage of the study is a list of challenges on the trans-Pennine routes, identified under the headings of network operation, asset conditions, capacity, safety, social and environmental. These challenges are prioritised where they have an effect on trans-Pennine connectivity:

- Journey-times are increased by delays at junctions and the geometry and topography of routes
- Long term traffic growth will bring some urban sections of routes to their capacity.
- Accidents reduce journey time reliability, with high accident rates on some routes and a number of accident clusters
- Severe weather causes road closures which reduce journey time reliability
- Maintenance on single carriageway sections reduces journey-time reliability
- Asset condition, including the standard, age and damage to infrastructure, reduce journey-time reliability through significant maintenance operations and risk from closures
- There is a lack of technology to assist in the operation and management of the routes and provide information for travellers

10.1.15 However, the overriding theme throughout Stage 1 of this feasibility study has been the need to deliver significantly improved connectivity across the North of England and the trans-Pennine corridor under the focus of this study is part of a wider network of routes which require significant enhancement. A vision to develop an interlinked network of strongly connected city economies across the North to provide a rebalancing of the UK economy is now the main focus of plans to invest in new transport infrastructure.

10.1.16 A set of objectives to lead the subsequent stages of the feasibility study have been formulated based on transport policy and the challenges identified on the route. These objectives will both help to steer the development of solutions to the challenges identified and enable the success of the implemented solutions to be assessed:

- **Connectivity** – improving the connectivity between Manchester and Sheffield through reduction in journey times and improved journey-time reliability;
- **Environmental** – avoiding unacceptable impacts on the natural environment and landscape in the Peak District National Park, and optimising environmental opportunities;
- **Societal** – improving air quality and reducing noise impacts, and addressing the levels of severance on the trans-Pennine routes in urban areas;

- **Capacity** – reducing delays and queues that occur during peak hours and improving the performance of junctions on the routes;
- **Resilience** – improving the resilience of the routes through reductions in the number of incidents and reduction of their impacts; and,
- **Safety** – reductions in the number of accidents and reductions in their impacts.

10.1.17 This report forms the basis of Stage 2 of the feasibility study which identifies and assesses a range of solutions to the challenges identified.

11 Glossary

AADT: Annual Average Daily Traffic – the average volume of daily vehicular traffic (Monday to Sunday) on a particular link for a specified year.

AAWT: Annual Average Weekday Traffic – the average volume of vehicular traffic on a weekday (Monday to Friday) on a particular link for a specified year.

Air Quality Management Area: An area identified by a local authority where Defra's national air quality objectives are unlikely to be achieved.

Airport City: An £800m property development, set to become a globally connected business destination located at Manchester Airport.

Airport City Enterprise Zone: Centred on the new Airport City development, businesses will be offered incentives to locate, in order to create new jobs and stimulate economic growth.

Ancient Woodland: Woodland that has existed continuously since 1600 or before in England, Wales and Northern Ireland (or 1750 in Scotland).

CONTRAM: CONTinuous TRaffic Assignment Model - software to model traffic demand and congestion.

D2N2 city region: The Local Enterprise Partnership for Derby, Derbyshire, Nottingham and Nottinghamshire

Flood Hotspot: A section of the road network that is considered at risk of flooding.

Glossop Spur: A proposal for a new link from the A57(T) to the A57 (part of the Mottram to Tintwistle Bypass Scheme).

GMTF: £1.5 billion fund to be spent on identified schemes such as new Metrolink lines, transport interchanges, rapid bus system developments and strategic highway schemes.

HS2: A planned high-speed railway between London Euston, the English Midlands, North West England, Yorkshire, and potentially North East England and the Central Belt of Scotland.

Important Area for Noise: Places that are exposed to the highest levels of noise, according to Defra noise mapping.

Important Bird Area: An area recognized as being a globally important habitat for the conservation of bird populations.

Link Capacity: The maximum sustainable flow of traffic passing in 1 hour, under favourable road and traffic conditions.

Local Enterprise Partnerships: Voluntary partnerships between local authorities and businesses to help determine local economic priorities and lead economic growth and job creation within the local area.

Northern Hub: A programme of targeted upgrades to the railway in the North of England. Scheduled to complete in 2019, it will allow up to 700 more trains to run each day and provide space for 44 million more passengers a year.

The Northern Way: A collaboration from February 2004 to March 2011 between the three northern regional development agencies, Northwest Development Agency, One NorthEast and Yorkshire Forward to focus on issues important for the whole of the North of England with a dimension larger than could be tackled by one region alone, for example, transport infrastructure.

SEMMMS: South East Manchester Multi-Modal Strategy (the A6 to Manchester Airport relief road), which will deliver enhanced access to the Airport City Local Enterprise Zone.

Scheduled monuments: A 'nationally important' archaeological site or historic building, given protection against unauthorised change.

Site of Special Scientific Interest: A conservation designation denoting a protected area in the United Kingdom.

Special Area for Conservation: An area which has been given special protection under the European Union's Habitats Directive.

Special Landscape Area: A non-statutory conservation designation used by local government to categorise sensitive landscapes which are, either legally or as a matter of policy, protected from development or other man-made influences.

Special Protection Area: An area of land, water or sea which has been identified as being of international importance for the breeding, feeding, wintering or the migration of rare and vulnerable species of birds found within the European Union.

TEMPRO: The Trip End Model Presentation Program - industry standard tool for estimating traffic growth.

TRADS Database: Traffic Information Database - contains count data from around 11,000 inductive loops installed across the HA network of strategic roads.

Trafficmaster: A leading provider of real-time traffic data in the UK. The Trafficmaster database holds data collected from in-vehicle GPS tracking devices which can be used to derive average speed, journey times, journey time variability, journey time reliability and a range of other statistics.

VMS: Variable Message Sign - an electronic traffic sign used to give drivers information about traffic congestion, accidents, incidents, roadworks, or speed limits on a specific link.

WebTAG: The Department for Transport's web-based multimodal guidance on appraising transport projects and proposals.