

North Pennines Route Strategy

Evidence Report

April 2014



Document History

North Pennines route-based strategy evidence report

Highways Agency

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1 Introduction

1.1 Background

- 1.1.1 The Highways Agency is responsible for planning the long term future and development of the strategic road network.
- 1.1.2 Route-based strategies (RBSs) will inform the investment strategy for our network. This will incorporate operation, maintenance and where appropriate, improvements to proactively facilitate economic growth, whilst delivering the outcomes set out in the five year strategic road network performance specification for the equivalent period.
- 1.1.3 The development of RBSs is based on one of the recommendations included in Alan Cook's report [A Fresh Start for the Strategic Road Network](#), published in November 2011. He recommended that the Highways Agency, working with local authorities (LA) and local enterprise partnerships (LEPs), should initiate and develop route-based strategies for the strategic road network.
- 1.1.4 The then Secretary of State accepted the recommendation in the Government's [response](#) (May 2012), stating that it would enable a smarter approach to investment planning and support greater participation in planning for the strategic road network from local and regional stakeholders.
- 1.1.5 The Highways Agency completed the following three pilot strategies which have been published on the [Agency website](#):
- A1 West of Newcastle
 - A12 from the M25 to Harwich (including the A120 to Harwich)
 - M62 between Leeds and Manchester.
- 1.1.6 Building on the learning from those pilot strategies, we have divided the strategic road network into 18 routes. A map illustrating the routes is provided in Appendix A. The North Pennines route is one of that number.
- 1.1.7 RBS are being delivered in two stages. Stage 1 establishes the necessary evidence base to help identify performance issues on routes and anticipated future challenges, takes account of asset condition and operational requirements, whilst gaining a better understanding of the local growth priorities.
- 1.1.8 In the second stage we will use the evidence to take forward a programme of work to identify possible solutions for a prioritised set of challenges and opportunities. It is only then that potential interventions are likely to come forward, covering operation, maintenance and if appropriate, road improvement schemes.
- 1.1.9 The RBS process will be used to bring together national and local priorities to inform what is needed for a route, while delivering the outcomes in the performance specification.

1.1.10 Using the evidence base and solutions identification studies, we will establish outline operational and investment priorities for all routes in the strategic road network for the period April 2015 – March 2021. This will in turn feed into the Roads Investment Strategy, announced by the Department for Transport in [Action for Roads](#).

1.2 The scope of the stage 1 RBS evidence report

1.2.1 During the first stage of RBS, information from both within the Agency and from our partners and stakeholders outside the Agency has been collected to gain an understanding of the key operational, maintenance and capacity challenges for the route. These challenges take account of the possible changes that likely local growth aspirations, or wider transport network alterations will have on the routes.

1.2.2 The evidence reports:

- Describe the capability, condition and constraints along the route
- Identify local growth aspirations
- Identify planned network improvements and operational changes
- Describe the key challenges and opportunities facing the route over the five year period
- Give a forward view to challenges and opportunities that might arise beyond the five year period.

1.2.3 The 18 evidence reports across the strategic road network will be used to:

- Inform the selection of priority challenges and opportunities for further investigation during stage 2 of route-based strategies
- Inform the development of future performance specifications for the Highways Agency.

1.2.4 A selection of the issues and opportunities identified across the route are contained within this report, with a more comprehensive list provided within the technical annex. This is for presentational reasons and is not intended to suggest a weighting or view on the priority of the issues.

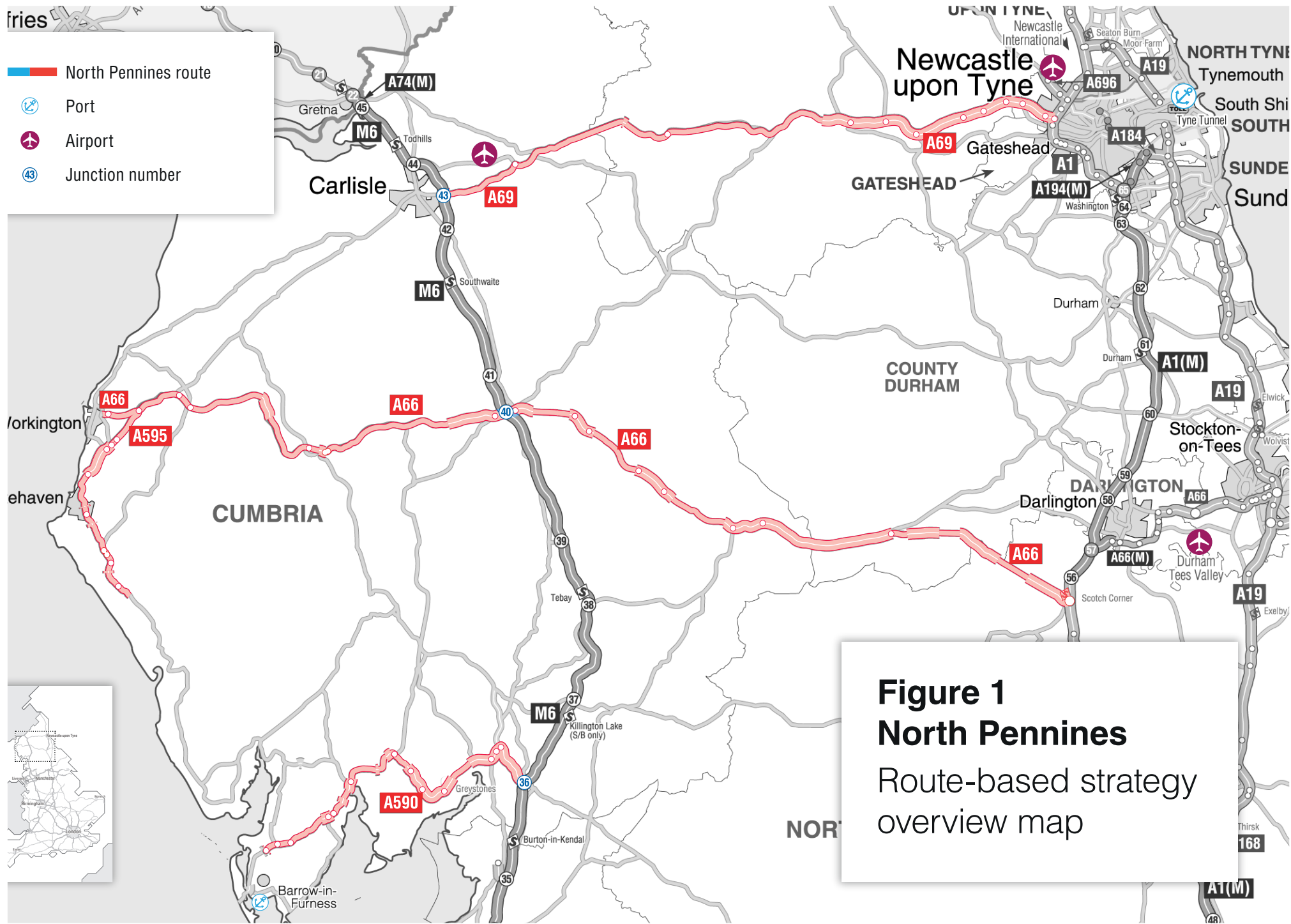
1.2.5 The evidence reports do not suggest or promote solutions, or guarantee further investigation or future investment for any of the issues identified.

1.3 Route description

1.3.1 The North Pennine route includes three distinct east- west corridors of the A69, A66 and A590. The route does not have any sections of motorway. Figure 1 shows the extent of the route.

1.3.2 In a national context, the route is relatively lightly trafficked with levels of HGVs from 10% to 30%. However, there are a number of routes which rank among the least reliable nationally. Details of traffic flows and reliability are provided in section 2.1.

- 1.3.3 The A69 is a Design, Build, Finance and Operate (DBFO) route which is 52 miles long between Carlisle and Newcastle and links the industrial areas of the North East and Teesside with the North West, the West of Scotland and, via the west coast ports, with Northern Ireland. The road is part of the Trans-European Network (TEN-T) which is comprised of roads, railways, waterways and airways considered vital for trans-European travel. It is primarily rural in nature and is single carriageway except for a 19-mile dual carriageway section between Hexham and the A1.
- 1.3.4 The A66 links the A1 from Scotch Corner running across the Pennines to the M6 at Penrith and further west through the northern sections of the Lake District to the coastal town of Workington. The route is mainly rural and includes a mix of both single and dual carriageway sections. The A66 provides a primary route for visitors to the northern Lake District National Park.
- 1.3.5 The most westerly section of the A66 becomes more urban in nature providing links into Workington, including the Port of Workington, and to the south along the A595 to Whitehaven and Sellafield. The A595 is mostly single-carriageway with a number of at-grade roundabouts, and suffers from regular congestion outside the normal morning and evening peak periods due to the high levels of employees working shifts.
- 1.3.6 The A590 links the M6 from Junction 36 through the town of Ulverston to the west coast town and ports of Barrow-in-Furness. The route is a mixture of single and dual carriageway with the sections to the east from the M6 being mainly dual. The route supports a mix of uses from long-distance freight traffic to the industries in Ulverston, Barrow-in-Furness, and the west coast ports, to local short commuter trips. It also caters for a large number of tourists entering the southern part of the Lake District National Park.
- 1.3.7 The rural nature of the entire route and the large sections of single carriageways means that the number of local alternatives are limited should the strategic road network become unavailable due to an incident, road works or a severe weather event. This is further compounded during the busy summer months with a high number of tourist visitors to the Lake District region.
- 1.3.8 At junctions with the M6, the route interfaces with the route-based strategy for London to Scotland (West), which covers the M6 to the Scottish border. At junctions with the A1 and A1(M), the route interfaces with the route-based strategy for London to Scotland (East). These points of interface are of almost equal importance for many stakeholders, with the M6 and A1 providing access for goods and services to the wider economy.
- 1.3.9 This route connects with a number of other routes for which RBS are also being developed. These are:
- London to Scotland West
 - London to Scotland East.



- North Pennines route
- Port
- Airport
- Junction number

Figure 1
North Pennines
 Route-based strategy
 overview map

2 Route capability, condition and constraints

2.1 Route performance

- 2.1.1 Nationally, the strategic road network comprises only three per cent of England's road network, but it carries one-third of all traffic. Around 80 per cent of all goods travel by road, with two-thirds of large goods vehicle traffic transported on our network.
- 2.1.2 The A69 carries over 24,000 vehicles per day on the most easterly section between the A1 and A68 and over 7,000 vehicles per day on the adjacent section between the A68 and M6.
- 2.1.3 The A66 carries over 7,000 vehicles per day (30% freight) on the easterly section between the A1 and M6 and over 9,000 vehicles per day (14% freight) between the M6 and the west coast. Both routes include a high proportion of long-distance journeys both commercial and tourist related. The routes between the A1 and M6 also serve local slow moving agricultural traffic making short journeys which can have an impact on other users, especially on the single carriageway sections.
- 2.1.4 The A595 carries over 10,000 vehicles per day (10% is freight) and includes a large number of work-based trips, particularly to and from Sellafield which is one of the largest employment sites in the Cumbria region. The A590 carries over 12,000 vehicles per day (11% is freight) at the eastern section and 8,000 vehicles per day (13% is freight) on the western section.
- 2.1.5 The ten most trafficked sections of this route are presented in Table 2.1. This is for the reporting period 1 April 2012 to 31 March 2013.

Table 2.1 Ten busiest sections on the route (1 April 2012 to 31 March 2013)

Rank	SRN section	Annual Average Daily Flow (AADT)	National Rank
1	A69 between A1 and A6085 (AL1226)	24,156	1,185
2	A69 between A6085 and A1 (AL557)	23,106	1,263
3	A69 between A6085 and A68 (AL522)	15,916	1,764
4	A69 between A68 and A6085 (AL521B)	15,826	1,771
5	A66 between M6 J40 and A6 (AL765)	13,687	1,917
6	A590 between A591 and M6 J36 (AL843)	13,190	1,944
7	A590 between M6 J36 and A591 (AL842)	12,864	1,960
8	A69 between A68 and A6079 (AL517)	12,573	1,980
9	A69 between A68 and A68 (AL521A)	12,457	1,991
10	A69 between A68 and A68 (AL1228)	12,443	1,992

- 2.1.6 Table 2.1 shows that seven of the ten busiest sections in the North Pennines route are located on the eastern section of the A69 between

Hexham and the A1, with the busiest sections between the A6085 at Throckley with an AADT of 24,156. Other sections ranked in the ten busiest are located on sections of the A66 and A590 adjacent to the M6.

2.1.7 The highest ranked section on the A69 is 1,185 out of 2,475 nationally highlighting that the sections within the North Pennines are not as heavily trafficked as other parts of the strategic road network.

2.1.8 However, busy roads in themselves don't necessarily represent the only issue we are interested in – our customers' experience of driving on the network is also important to us. The [Strategic road network performance specification 2013-15](#), sets us high level performance outcomes and outputs under the banner of an efficiently and effectively operated strategic road network. We currently measure how reliable the network is based on whether the 'journey' time taken to travel between adjacent junctions is within a set reference time for that period, that is, 'on time'.

Table 2.2 Ten least reliable journey-time locations on the route (1 April 2012 to 31 March 2013)

Rank	Location	On-time reliability measure	National Rank
1	A66 between A6 and M6 J40 (AL766)	56.1%	35
2	A590 between A65 and M6 J36 (AL841)	60.3%	81
3	A66 between M6 J40 and A6 (AL765)	60.5%	86
4	A590 between M6 J36 and A65 (AL840)	63.4%	181
5	A69 between A6079 and A6079 (AL1235)	65.7%	303
6	A69 between A6079 and A6079 (AL497)	66.9%	386
7	A69 between A6085 and A1 (AL557)	67.7%	467
8	A69 between A686 and A6079 (AL3572A)	70.0%	709
9	A590 between A5074 and A6 (AL1387)	70.1%	716
10	A595 between A5086 and A5094 (AL3623)	70.1%	726

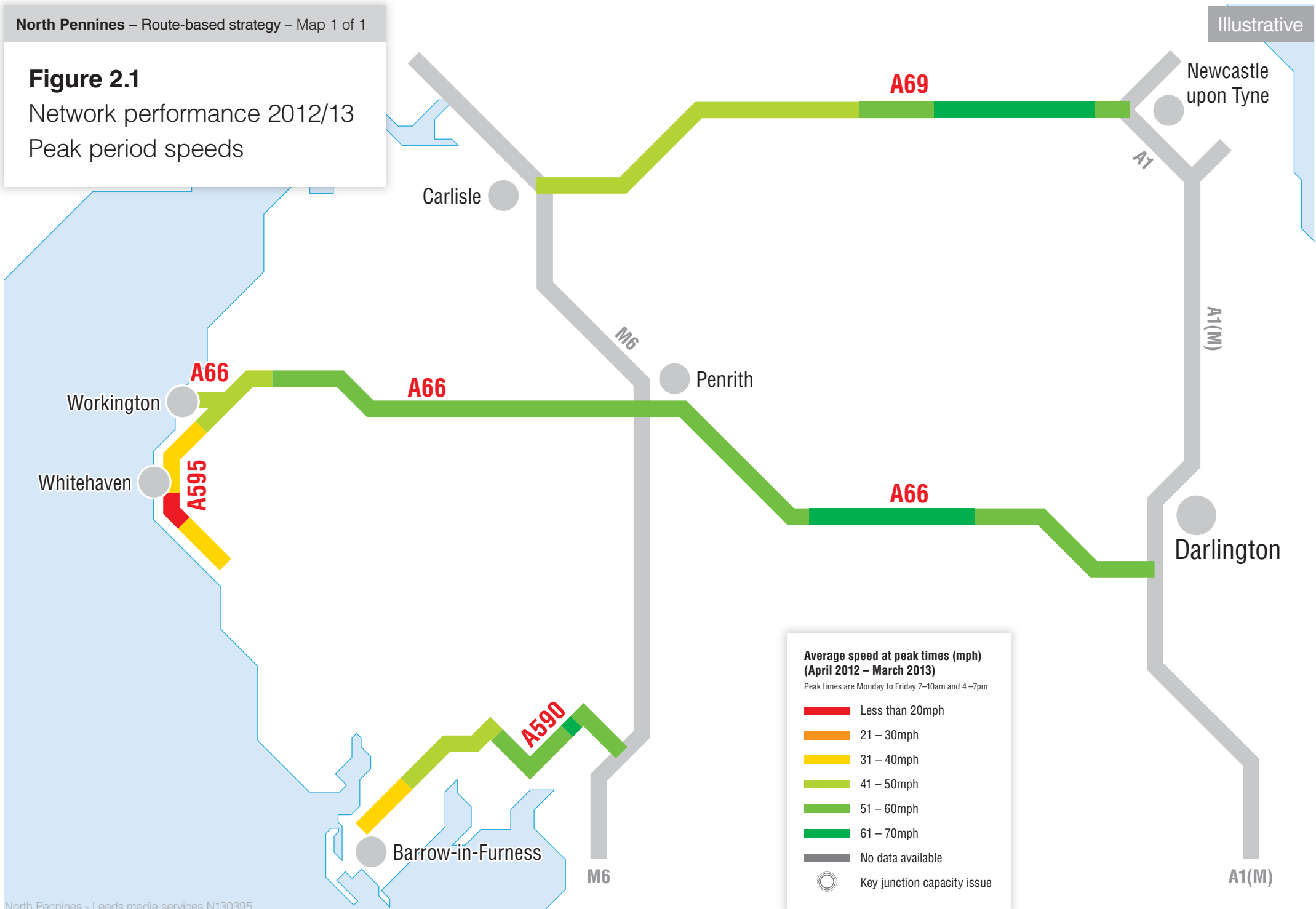
2.1.9 Table 2.2 shows that four of the ten least reliable journey time locations occur on the A69 on the eastern section adjacent to the A68, three on the A590 and two on the A66 both adjacent to the M6. It should also be noted that one section on the A595 south of Whitehaven is ranked as tenth least reliable within the North Pennines route. Three of the ten sections are ranked within the 100 least reliable journey time locations nationally.

2.1.10 Figure 2.1 illustrates the average speeds during weekday peak periods between 1 April 2012 and 31 March 2013. The peak periods are generally the busiest periods on the network and help us to understand the impact of the worst congestion on customers' journey times. Figure 2.1 also shows any known performance or capacity issues where the local road network interfaces with the route.

2.1.11 Figure 2.1 demonstrates that peak hour speeds are marginally lower than speed limits on the single carriageway sections of the A69 between Brampton and Carlisle, and also on the A66 between Keswick and Workington. The A66 east and west approaches to M6 Junction 40 at Penrith is shown to experience significantly lower peak hour speeds on dual carriageway sections of between 31-50mph with Stakeholder feedback identifying peak hour congestion at this junction. The A590 between Newby Bridge and Barrow-in-Furness is shown to experience peak hour speeds of between 31-50mph which was referenced by Stakeholders as causing congestion. The lowest peak hour speeds are shown on the A595 sections between Workington and Sellafield with speeds between 21-40mph. These sections are single carriageway and pass through built up areas with stakeholder feedback indicating that the impact of Sellafield staff commuting trips is significant.

Figure 2.1

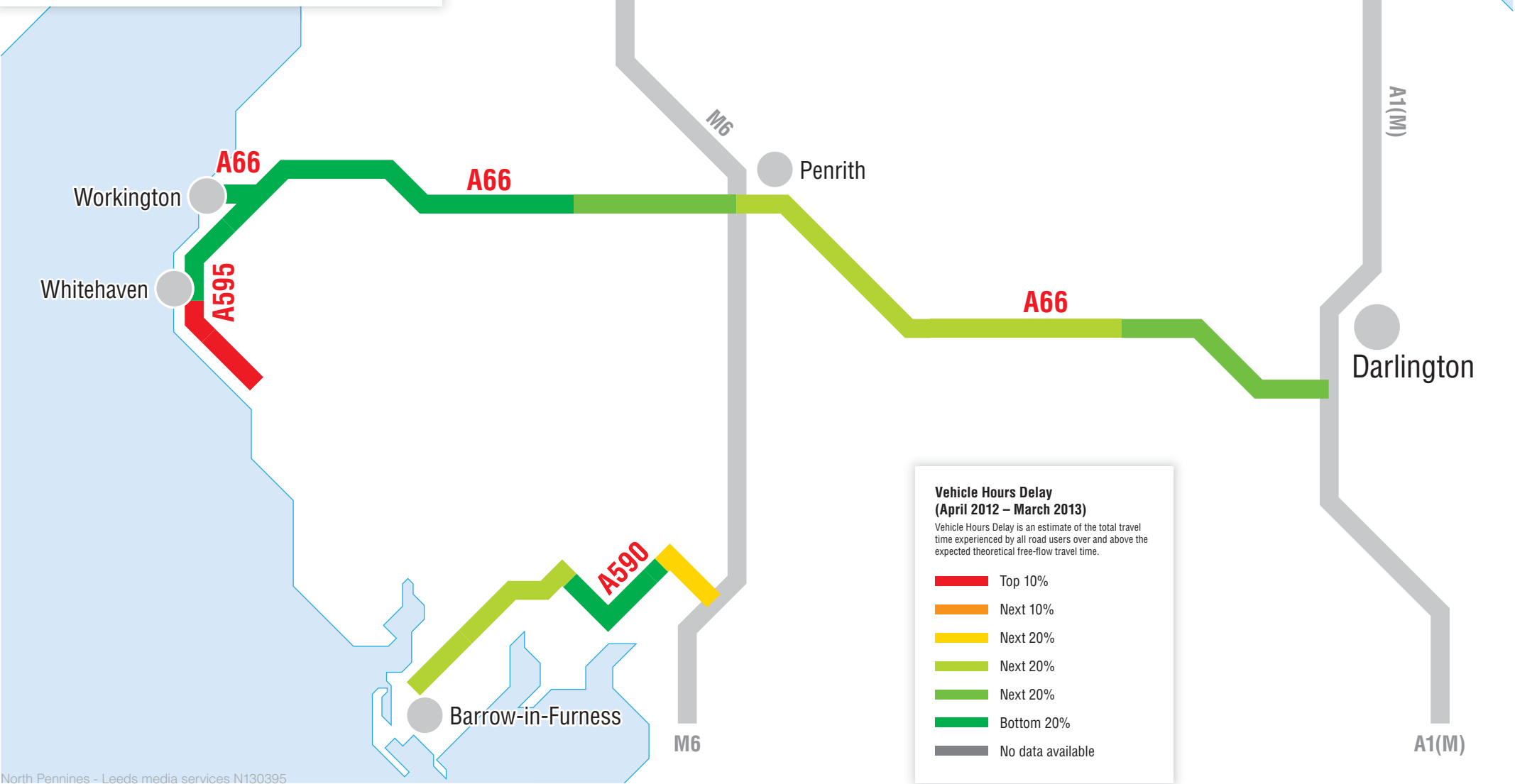
Network performance 2012/13
Peak period speeds



- 2.1.12 The strategic road network is key in promoting growth of the UK economy, and alleviating congestion can realise economic benefits. The West of Cumbria is designated as a UK Assisted Area, which benefits from regional and European funding to support economic growth and redress regional disparities, and the future performance of the strategic road network is likely to significantly influence this.
- 2.1.13 Figure 2.2 shows the delay on our network compared with a theoretical free-flowing network.
- 2.1.14 Figure 2.2 highlights that links with low peak hour speeds also experience corresponding delay with particular reference to A595 Whitehaven to Sellafield, A590 west of M6 Junction 36 and A590 Newby Bridge to Barrow-in-Furness. In addition, links on the A69 between Hexham and Newcastle and A66 between Brough and Penrith are shown to experience mid-level delay with the latter noted by stakeholders as experiencing regular congestion on the approach to the M6 at junction 40.

Figure 2.2

Network performance 2012/13
Delay



Vehicle Hours Delay (April 2012 – March 2013)
Vehicle Hours Delay is an estimate of the total travel time experienced by all road users over and above the expected theoretical free-flow travel time.

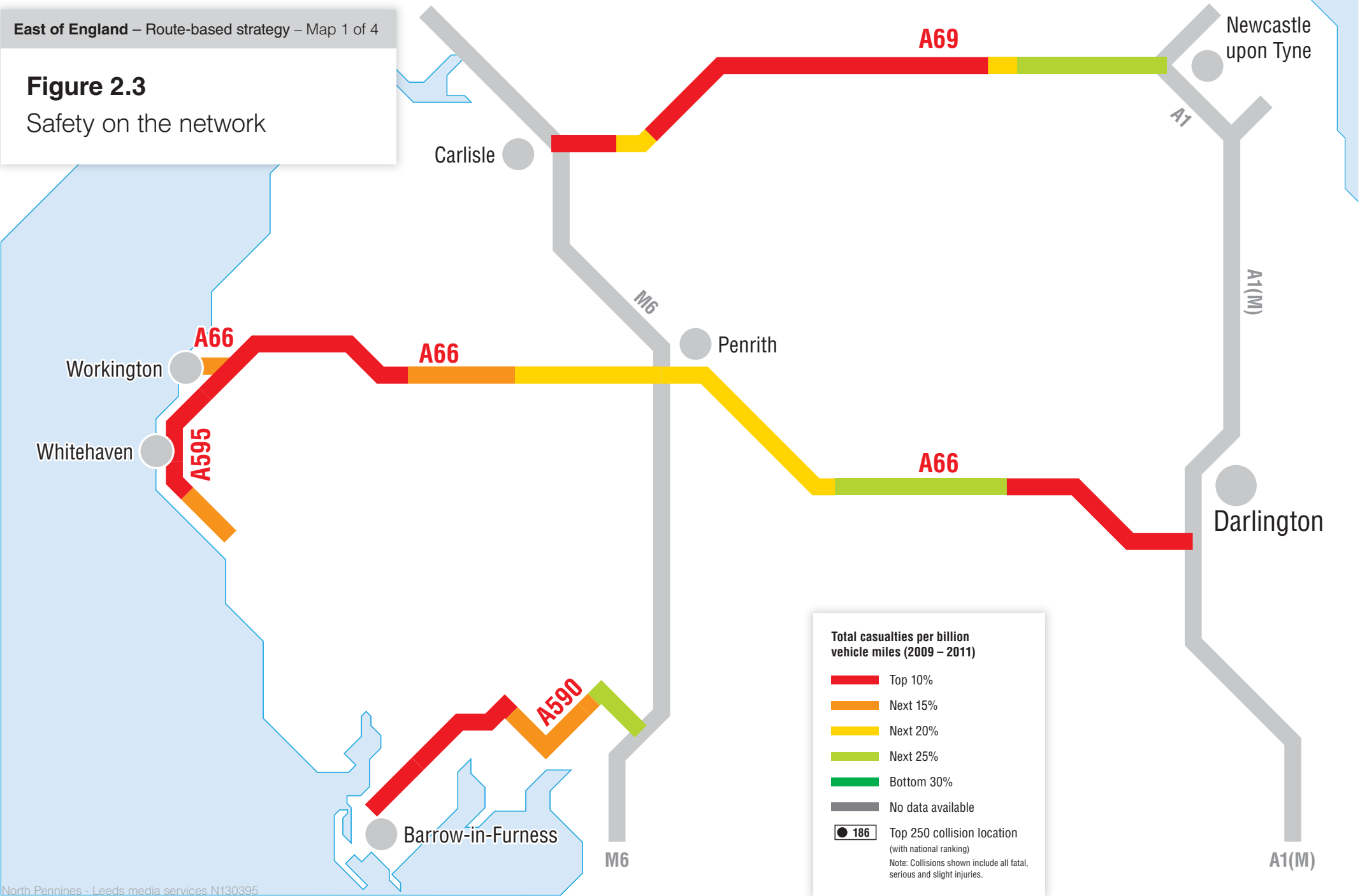
- Top 10%
- Next 10%
- Next 20%
- Next 20%
- Next 20%
- Bottom 20%
- No data available

2.2 Road safety

- 2.2.1 As a responsible network operator and through the [Strategic road network performance specification 2013-15](#), the Highways Agency works to ensure the safe operation of the network.
- 2.2.2 By 2020, [The strategic framework for road safety 2011](#) forecasts the potential for a 40% reduction of the numbers killed or seriously injured on the roads compared with 2005-2009. We are working toward this aspirational goal.
- 2.2.3 Figure 2.3 illustrates the rates of injury collisions between 2009 and 2011. Injury collisions are collisions where people were injured and their injuries were slight, serious or fatal. Damage only incidents have not been included. The top 250 casualty locations have been calculated nationally, and are based on the number of casualties which occurred within a distance of 100m. Locations with the same number of casualties have been given a “joint” ranking and therefore, there may be some locations with the same rank number.
- 2.2.4 Across the strategic road network, the records of injury collisions show generally lower rates of collisions on motorway sections than on all-purpose trunk road sections. On the routes within this study in the three year period 2010 to 2012, there have been 683 injury collisions of which 174 involved death or serious injury. There have been 1,092 people injured in the period of which 26 died.
- 2.2.5 In terms of vehicles/road users involved in the collisions:
- 3.7% of vehicles involved were HGVs
 - 4.4% involved pedestrians or cyclists
 - Where the age of drivers was known 7.6% were young drivers (aged 16-19)
 - 16.9% were older drivers (aged 60 or over).
- 2.2.6 The route has a number of links shown as having a high or very high rate of injury collisions. However, this is in part due to the characteristics of the route, as single carriageways tend to show a higher collision rate than dual carriageways and motorways, and low traffic volumes mean that a small number of collisions can skew the collision rate upwards. The route does not contain any locations identified as within the top 250 national locations for injury collisions. Details of recently completed and committed schemes to address safety concerns are shown in section 3.
- 2.2.7 The A590 has a number of sections shown as having high collision rates. Specifically, these are westbound from Barrow-in-Furness to Newby Bridge, eastbound from the A5092 to Ulvertston, and on the westbound approach to the junction with the A591.
- 2.2.8 On the A595, most of the route between Sellafeld and its junction is shown as having a high collision rate. The areas south of Whitehaven, southbound towards Whitehaven and Northbound to the junction with the A66 are within the 20% of routes with highest injury collision rates.

- 2.2.9 Areas on the A66 shown as having particularly high rates of injury collisions include westbound between Cockermouth and Keswick, on both the approaches to the M6 as well as on the westbound exit, and westbound to the Scotch Corner junction with the A1. There are a number of specific locations identified on links between the A67 at Bowes and the A1 where clusters of collisions have occurred at the access to farms and other businesses. The junction for Mainsgill Farm has recently been improved to help make turning safer. Studies have been completed at other locations to identify the appropriate improvements.
- 2.2.10 On the A69, only the westbound link from Haydon Bridge to the A6079 at Hexham is ranked among those with the highest injury collision rates. However, except for the short section around Haltwistle, the whole route westbound from Carlisle to Hexham is shown as having a high collision rate.
- 2.2.11 While we aim to reduce the numbers killed or seriously injured using and working on the SRN, we will always identify more safety interventions than our budget allows us to implement. We use a prioritisation process to help us and we review this regularly to ensure we are targeting the locations with the greatest opportunity to save lives and reduce the severity of injury.

Figure 2.3
Safety on the network



2.3 Asset condition

- 2.3.1 We carry out routine maintenance and renewal of roads, structures and technology to keep the network safe, serviceable and reliable. We also ensure that our contractors deliver a high level of service on the strategic road network to support operational performance and the long-term integrity of the asset.
- 2.3.2 From new, assets have an operational 'life' within which, under normal conditions and maintenance, the risk of failure is expected to be low. Beyond this period, the risk of asset failure is expected to increase, although for many types of asset the risk of failure remains low and we do not routinely replace assets solely on the basis that they are older than their expected operational life. We use a combination of more regular maintenance and inspection along with a risk-based approach to ensure that assets remain safe while achieving value for money from our maintenance and renewal activities.
- 2.3.3 We maintain a National Asset Management Plan as an annual summary of the Agency's network asset inventory and condition. It is aimed at ensuring there is sight of future issues affecting the asset and enabling strategic decision making.

Carriageway Surface

- 2.3.4 The road surface on the strategic road network is primarily surfaced with two types of flexible bituminous materials, namely Hot Rolled Asphalt (HRA) which has an approximate design life of 25 years and Thin Surface Course System (TSCS) with a lower construction cost and shorter design life of 10-15 years. Large tranches of HRA were laid in the 1990s and TSCS tranches laid in the 2000s resulting in a significant proportion of the network reaching the end of its design life by 2020.
- 2.3.5 It should be noted that, although carriageway surfacing may be identified as reaching or exceeding its design life, the surfacing will not necessarily require treatment at this point. Carriageway surfacing that is beyond its design life is at a higher risk of failure, with such risk increasing the longer that the surfacing exceeds its design life. The increasing age of the surfacing could manifest in an increased frequency of maintenance interventions which, if a renewals scheme is not funded, may result in a higher cost both financially and in terms of disruption to road users to maintain the asset in a safe and serviceable condition.
- 2.3.6 Over the route as a whole the surface is primarily long-life surface, with approximately 42% HRA and 58% TSCS. There are also short sections of concrete surface which makes up less than 0.5% of the carriageway surface. Long-life surface is expected to have an operational life of between ten and fifteen years. However, in the north of England particularly, maintenance records show that TSCS installed to the current standard tends to deteriorate at a much faster rate than would normally be expected. Preliminary studies suggest that this is in part due to frequent exposure to low winter temperatures, which causes the

binding material to become brittle and more prone to breaking up under normal traffic flows.

2.3.7 Action for Roads identified that around 80% of the Strategic Road Network in England will need to be resurfaced by 2021. Through our ongoing management of the network we maintain a database of surfaces across the whole network which is supplemented by regular inspections to inform our plans for maintenance, and it is likely that a significant proportion of the network will require resurfacing, including sections of the A66 A590 west of the M6. All resurfacing on east-west routes in Cumbria has the potential to cause significant disruption due to the length and suitability of tactical diversion routes. The sections managed by DBFO Companies are maintained to a contractual standard which includes resurfacing as required.

2.3.8 A further issue for surfacing is the renewal of road markings, including reflective studs. These are expected to have a much shorter lifespan, leading to more frequent works to renew. All road markings and studs on the network are expected to require renewal at least once before 2021, with the most heavily trafficked sections renewed twice.

2.3.9 As indicated above, we also have concrete road surface material but this is only a very small proportion when compared to the length of flexible road surfaces. The amount of concrete road surface is also reducing. As it reaches the end of its serviceable life it is replaced by flexible material. Concrete is not a material we now use in new carriageway construction on any of the motorway and trunk road network.

Structures

2.3.10 Across the route, there are a number of common issues affecting structures which require substantial ongoing expenditure on remedial maintenance. The age of structures on the route is largely consistent with that of the strategic network as a whole. However, with the route being in an exposed geographical location and routinely subject to severe weather, some structures on the route have deteriorated more than average for the network.

2.3.11 There are typically six main issues which affect structures across the whole network. These are:

- Deteriorating concrete: As concrete ages, it tends to degrade due to the effects of weather, and this can both reduce its strength and stability, and negatively affect its appearance. Typical problems include minerals leaching from concrete, and alkali-silica reactions and corrosion of steel reinforcement leading to cracking and spalling.
- Bearing failure: Bearings are the contact points between bridge abutments and piers which support the bridge deck, but allow it to flex. Many structures along the route are carrying substantially higher vehicle numbers than they were designed for, leading to bearings failing sooner than designed for.

- Life expired and failing waterproofing: waterproofing on structures needs to be replaced on a more frequent basis, with a number of structures requiring substantial works prior to 2021. Where waterproofing fails, this can lead to far greater problems due to water penetrating into structural elements causing corrosion and delaminating surfaces due to freezing.
- Expansion joint failure: many bridges and structures have expansion joints to allow them to expand and contract safely with changes in temperature. As with bearings, high levels of traffic are causing expansion joints to fail sooner than might otherwise be expected.
- Half Joints durability: a number of structures have half joints which are a structural detail allowing for continuity of the superstructure. Moisture within the joint can lead to deterioration of the supporting structure, which is made worse by the inherent difficulty in inspecting and monitoring half-joints. Significant defects with this detail can lead to the need for a complete renewal of a structure.
- Corroded parapets: parapets, or barriers, are essential to protect road users and therefore need to maintain a suitable level of impact protection. As parapets corrode with age, they become weak and require replacement.

2.3.12 Severe winter weather in 2009/10 and 2010/11 contributed to acceleration in the number of structural defects occurring, which is taken into account within our forward programme of surveys and maintenance.

2.3.13 There are no structures identified on the route with a significant risk of impacts on strategic traffic on the route, or which are expected to require significant works in the period to 2021. On the A69, structures are maintained by the DBFO Company to a contractually specified standard.

Other key asset issues for routes

Drainage

2.3.14 The Agency maintains a database of its drainage assets and details of flooding events affecting the route, and uses risk assessment to monitor areas of flood risk.

2.3.15 Nationally, many rural non-motorway trunk roads do not have any dedicated drainage installed, with water instead allowed to drain away over the edge of the carriageway, and this can have a negative effect on the condition of the carriageway surface. Most drainage discharges directly into streams and other watercourses without pollution control. A network wide pollution threat study was carried out which concluded no outfalls on the route reach the threshold to require improvement works.

Lighting

2.3.16 Except for on approach to roundabouts and when passing through or near settlements, the majority of the route is not lit. There are a number

of areas of lighting where the asset is approaching end of design life, and these areas of network will be subject to regular assessment over the strategy period to ensure that they are removed, renewed or replaced before they become unsafe. A key area of concern includes the dual carriageway sections of the A66 in the North East.

Geotechnical

- 2.3.17 In certain areas of the network, the ground conditions underneath roads and structures are poor, which can lead to movement and damage over time. There are a small number of areas nationally where the risk is high or severe, and we monitor these on a regular basis.
- 2.3.18 Embankment undercutting by premises alongside the A66 in the North East is becoming a more common problem, which is complicated by land boundaries being positioned in the midpoint of embankments allowing adjacent properties to undermine HA geotechnical structures. This tends to be a localised issue within individual geotechnical features although its effects can be severe if it is not recognised quickly. These issues are managed with monitoring until satisfactory mitigation can be identified.

2.4 Route operation

Incident Management

- 2.4.1 We work hard to deliver a reliable service to customers and to reduce the number of incidents and the impact on road users.
- 2.4.2 Across the whole network, the Highways Agency Traffic Officer Service responds to around 20,000 incidents each month. We measure how effective we are at managing incidents by looking at the time incidents affect the availability of running lanes.
- 2.4.3 The route is covered by the Highways Agency Traffic Officer Service, operating from two regional control centres in the North West and the North East. Although the route benefits from high level management and coordination, it does not have a dedicated on-road patrol service.
- 2.4.4 We have a good understanding of the types of incidents which are quick to clear up and those which take longer. In general, there are far more incidents which don't affect the running lanes for very long, and mostly these are caused by breakdowns in the live lanes, debris or damage only collisions. The longest duration incidents are mostly caused by infrastructure issues, such as road surface repairs, bridge strikes, barrier collisions and spillages.
- 2.4.5 We continue to work with our partners in the emergency services to reduce the impacts on our network from serious collisions and long-duration incidents.
- 2.4.6 Within Cumbria particularly, the length of diversion routes used in case of carriageway closures is a particular issue. For example, formal diversion routes on the A590 are mainly unsuitable for HGVs or result in strategic traffic passing through residential areas of Kendal and

Windermere. In the two-year period to August 2012 on the A590 there were 16 road traffic collision incidents which resulted in the closure of the carriageway for more than 30 minutes, around 10% of the total number of collisions, with these incidents having an average closure of almost four hours.

Flooding

2.4.7 We have a responsibility to reduce flooding. Flooding of the HA network impacts upon network performance and the safety of road users. Flooding off the network has an impact on third parties living adjacent to it.

2.4.8 Based on recorded flooding incidents, we have identified those parts of the network that are at high risk of repeated flooding. There are localised areas of flood risk in a number of areas on the network due to water run-off from adjacent land owned by other people, such as on the A66 at Bowes where the eastbound carriageway is susceptible to flooding from the adjacent higher moorland, and at the Chapel Beck aqueduct. There is also a history of flooding events on the A590 at Low Field Bridge, where pumps have been used to discharge flood waters onto adjacent land.

Severe Weather

2.4.9 The HA aims to minimise where possible the impacts of severe weather, such as strong winds and snow, on network performance and the safety of road users.

2.4.10 On the A66 between the M6 and A1, the route reaches high altitude and is therefore often closed to high-sided vehicles due to wind, or subject to full closures due to drifting snow and/or freezing fog. Physical gates are used when the route is closed, as well as variable message signs to warn travellers at either end.

2.4.11 On the A66 West of the M6, the emergency diversion route between Stainburn and Chapel Roundabouts is not routinely treated with salt by Cumbria County Council, meaning that it cannot be used as a diversion route until it has been treated.

2.4.12 As a route through a largely rural area, there are a number of sections in Cumbria which can be quickly blocked in the event of snow and ice. Notable locations include on the A590 at Low Newton and Lindal Hill.

2.4.13 There is no history of closures due to severe or winter weather on the A69 between the M6 and A1.

2.5 Technology

2.5.1 The Highways Agency works hard to deliver a reliable service to customers through effective traffic management and the provision of accurate and timely information. We provide information to our customers before and during their journeys.

- 2.5.2 We monitor key parts of our network using CCTV and use sensors in the road to monitor traffic conditions. These are used by our National Traffic Operations Centre and seven Regional Control Centres to provide information to customers before their journeys, for example on the [Traffic England website](#) or through the [hands-free traffic app](#) for smartphones. Whilst on the network, we also inform our customers using variable message signs (VMS).
- 2.5.3 Technologies such as overhead gantries, lane specific signals and driver information signs also form part of how we can operate our network efficiently. In some locations on the SRN we have controlled motorways, which is where we can use variable mandatory speed limits to help keep traffic moving. Smart motorways use both variable mandatory speed limits and the hard shoulder as an additional live traffic lane during periods of congestion. Ramp metering manages traffic accessing the network via slip roads during busy periods to help avoid merging and mainline traffic from bunching together and disrupting mainline traffic flow.
- 2.5.4 Except for on the A66, the route is not equipped with technology. The A66 has a number of variable message signs which are set from the regional control centres and which are used to warn of closures on the route due to snow, high winds or fog.

2.6 Vulnerable road users

- 2.6.1 For the purpose of this section, the term ‘vulnerable users’ refers to cyclists, pedestrians, equestrians and motorcyclists.
- 2.6.2 The route is made up of a combination of high standard dual carriageway with limited accesses, and lower-standard single carriageway with frequent accesses. Vulnerable users can use all sections of the route, so our focus is on ensuring that they can do so safely. In addition, there are a large number of locations where routes for vulnerable users cross the route.
- 2.6.3 The route interacts with a number of National Cycle Network numbered routes. Route 72 follows the Cumbria coastline, interacting in a number of locations with the A595. It then extends from Carlisle along the route of Hadrian’s Wall, crossing the A69 at a number of locations and including an off-road section adjacent to the A69 south of Haltwistle. Route 71 crosses the A66 near Cockermouth and follows the A66 for much of the route between Bassenthwaite Lake and the M6, with a mix of off-road and on-road sections, also crossing the A66 again near Penrith.
- 2.6.4 Route 70 crosses the A590 in a number of locations between Barrow-in-Furness and the M6, and includes an adjacent off-road section west of the A5074. Further east, the A66 is crossed by route 68 at Appleby and route 70 at Bowes.
- 2.6.5 The Pennine Way crosses both the A66 near Bowes via a subway, and the A69 near Greenhead at grade, while a number of other bridleways

and public footpaths cross the route or run parallel to the route in places.

2.6.6 In 2007, parts of the A66 in the North East were upgraded to dual-carriageway, and at this time there were a number of public rights of way which were re-routed along with the installation of barrier protected crossing points and warning signs for drivers to facilitate safer crossing by equestrians. In the current year, a scheme developed in response to concerns raised by the British Horse Society will be implemented to improve the signing of an existing bridleway between the Melsonby and Winston junctions on the A66.

2.6.7 The route has not been highlighted by Sustrans as one which requires significant intervention to improve the current level of facilities offered to cyclists. During the stakeholder events, issues were raised generally about the lack and quality of routes and crossings for vulnerable users on the A66.

2.7 Environment

2.7.1 As a responsible network operator and through the [Strategic road network performance specification 2013-15](#), the Highways Agency works to enhance the road user experience whilst minimising the impacts of the strategic road network on local communities and both the natural and built environment.

Air quality

2.7.2 We recognise that vehicles using our road network are a source of air pollution which can have an effect on human health and the environment. We also appreciate that construction activities on our road network can lead to short-term air quality effects which we also need to manage.

2.7.3 The Highways Agency is committed to delivering the most effective solutions to minimise the air quality impacts resulting from traffic using our network. We will operate and develop our network in a way that works toward compliance with statutory air quality limits as part of our broader [Environmental Strategy](#).

2.7.4 There are no declared Air Quality Management Areas (AQMA) on or adjacent to the route. Carlisle City Council and Newcastle City Council have declared AQMAs which do not affect the route.

Cultural heritage

2.7.5 The Highways Agency is committed to respecting the Environment across all its activities and to minimising the impact of the trunk road on both the natural and built environment. Wherever possible, balanced against other factors, Agency schemes are designed to avoid impacts on cultural heritage assets.

2.7.6 The route is in close proximity to a large number of cultural heritage sites. The most notable of these are the remains of Hadrian's Wall and Vallum (earthen rampart) which passes beneath the M6 to the north

east of Carlisle and follows a west-east route north of the A69, forming part of the UNESCO Frontiers of the Roman Empire (Hadrian's Wall) World Heritage Site. Parton Roman Fort Scheduled Monument adjacent to the A595 north of Whitehaven also forms part of this World Heritage Site. The A69 from Milton to Greenhead falls within the World Heritage Site buffer zone.

2.7.7 Much of the A66 to the west of Penrith follows the course of an existing Roman road, with several roman forts and scheduled monuments alongside the carriageway. The Grade 1 listed Workington Hall and Parish Church of St Bridget Brigham are both adjacent to the A66 in Allerdale district.

2.7.8 East of Penrith, the A66 partly follows the alignment of a former Roman route with known buried archaeology directly on the route, along with several roman forts, settlements and camps. These are at Scots Dike, Carkin Moor, Greta Bridge, Bowes and Rey Cross. There are similarly a number of listed structures along the route, which mainly take the form of historic mileposts. Closer to Penrith, there are Roman forts located at Troutbeck, Brougham, Kirkby Thore and Warcop. The Countess Pillar Scheduled Monument located to the east of Brougham is situated within the A66 highway boundary. There are a large number of listed structures along the route, which includes a number of historic mileposts within the highway boundary.

Ecology

2.7.9 The Agency's activities, including road construction projects and maintenance schemes, have the potential to impact on protected sites, habitats and species. We aim to minimise the impact of our activities on the surrounding ecology and wherever possible contribute to the creation of coherent and resilient ecological networks by maximising opportunities for protecting, promoting, conserving and enhancing our diverse natural environment.

2.7.10 The route abuts or passes close to a large number of nationally designated Sites of Special Scientific Interest (SSSI), Special Areas of Conservation (SAC) and wetlands of international importance, known as Ramsar sites.

2.7.11 Much of the A590 route in Area 13 interacts with ecosystems that are designated at a European Level, notably the River Kent SAC and Morecambe Bay Ramsar, SPA and SAC. The A590 runs adjacent to a number of other terrestrial SACs including Roudsea Woods SAC. The route passes between areas of broad leaved semi ancient woodland, South Lakeland fells and wooded river valleys; areas which provide habitat for native species which are of local and European ecological significance. The A590 also passes through the Morecambe Bay Limestones and Wetland Nature Improvement Area.

2.7.12 On the A595, there is a belt of semi ancient woodland within Whitehaven that forms part of Crow Park Wood, an area that provides important habitat for species associated with woodlands.

- 2.7.13 Most of the A66 route interacts with aquatic and terrestrial ecosystems that are designated at a European Level. The route passes close to a significant number of SACs including Bassenthwaite Lake and River Derwent SAC in the Keswick area and the River Eden SAC in the Penrith area. Both these designated sites are river catchments that cross under the carriageway at various locations and are impacted by run-off from the A66.
- 2.7.14 The Derwent or tributaries of it cross under the A66 at eight locations and the Eden at five different locations. The designated rivers and streams on the route are home to otters, native white-clawed crayfish and other priority species. In addition, there are habitat sites on the A66 for great crested newts, adder and common lizard.
- 2.7.15 As the A66 rises eastwards over the Pennines the route passes through the North Pennine Moors Special Protection Area (SPA) which is designated for birds under European Law. The route passes through a series of differing ecological habitats including broadleaved and coniferous semi ancient woodlands near Whinlatter and Keswick, Lake District Fells, the Eden Valley and the North Pennines moors. These landscapes provide habitats for a variety of species of local and European importance.
- 2.7.16 The A69 between Carlisle and Newcastle similarly passes close to the North Pennine Moors Area of Outstanding Natural Beauty (AONB), and abuts or impacts upon a number of SSSIs and other designated sites.
- 2.7.17 Bat and bird boxes have been erected throughout the route within the Highways Agency estate. Monitoring undertaken over several years confirms high levels of use of the boxes.

Landscape

- 2.7.18 Roads and other transport routes have been an integral part of the English landscape for centuries. However, due to large increases in traffic, combined with modern highway requirements, they can be in conflict with their surroundings. We are committed, wherever possible, to minimise the effect of our road network on the landscape.
- 2.7.19 In Cumbria, the A590, A595 and A66 all pass through or close to the Lake District National Park, which was the second National Park created in England in 1951. The A66 climbs up through the Eden valley onto the distinctive high moorland of the North Pennines AONB which is also a UNESCO endorsed European Geopark designated for its geological heritage. The A69 between Carlisle and Newcastle also passes close to the northern edge of the North Pennines AONB.
- 2.7.20 To the north of the A69 is Northumberland National Park, which along with Kielder Water and Forest Park was designated in December 2013 as a Dark Sky Park, which the International Dark Skies Association defines as “a public land possessing an exceptional or distinguished quality of starry nights and a nocturnal environment that is specifically protected for its scientific, natural, educational, cultural heritage, and/or public enjoyment”.

Noise

- 2.7.21 Traffic noise arising from the Highways Agency's network has been recognised as a major source of noise pollution.
- 2.7.22 We take practical steps to minimise noise and disturbance arising from the road network. This includes providing appropriate highway designs and making more use of noise reducing technologies.
- 2.7.23 In 2012, Defra completed the first round of noise mapping and action planning which identified the top one per cent of noisiest locations adjacent to major roads. These were based on the conditions in 2006. The locations in this top one per cent are known as Important Areas (IAs). Within the important areas, those with road traffic noise levels in excess of 76 decibels according to the results of Defra's strategic noise maps are designated as Important Areas with First Priority Locations (FPLs).
- 2.7.24 The Highways Agency has identified a number of IAs and FPLs and produced action plans to address noise concerns within them. The action plans set out a framework for managing noise rather than propose specific mitigation measures.
- 2.7.25 On the A590, there are six FPLs near West Bergholt, Backbarrow and Newby Bridge, and at Ulverston, where there are also five IAs. There is also a large IA which runs adjacent to Parton, to the north of Whitehaven.
- 2.7.26 On the A69, there are FPLs at West Denton near the junction with the A1, and west of the West Denton junction. There is also an IA at Show House Farm, close to the junction with the A68.
- 2.7.27 There are no IAs or FPLs identified on the A66 between the M6 and A1.
- 2.7.28 There are also a number of locations on the route where Defra modelling does not identify a particular area as a priority location, but where correspondence with residents, local authority officers and elected officials has highlighted a problem. Within these locations we monitor the problem and look for opportunities to take action, such as by planning our maintenance to minimise the impact of noise.

Water pollution risk

- 2.7.29 We have a duty not to pollute water courses and ground water. We have identified those highway discharge locations across our network where there is an existing potential water pollution risk.
- 2.7.30 Cumbria has several locations at risk from water pollution, with a number of clusters identified on the A590 and A66. On the A66 high water pollution risk is concentrated to the West of Cumbria, with over 40 points on the carriageway identified as being at risk, compared with only 1 point being at risk on the A66 towards the East of Cumbria (near Brough). The A595 does not have any sites with a high or very high identified risk of water pollution.
- 2.7.31 One particular high risk cluster is situated along a stretch of the Western A66 adjacent to Bassenthwaite Lake. Bassenthwaite Lake is an

environmentally sensitive location due to the close proximity of the road and the high levels of run-off it receives from the surrounding valleys. In 2011 a scheme was developed to reduce the amount of potentially contaminated water reaching the lake, with the establishment of reed beds to naturally filter pollutants before the run-off entered the lake, and interceptors that can be closed off in the event of an collision to contain pollutants, and pollution control stations to aid a rapid response to spillages.

3 Future considerations

3.1 Overview

3.1.1 There is already a lot known about the planned changes to and around the route. Local authorities and the development community are already pushing forward the delivery of their housing and economic growth aspirations, as set out in their local plans. The Highways Agency has a large programme of schemes it has to deliver, plus an even larger programme of pipeline measures that could come forward after the general election. Local authorities, together with port and airport operators, are progressing measures to improve the operation and performance of their transport networks and facilities.

3.1.2 All of these issues have the potential to directly influence the ongoing performance and operation of the route. Figure 3 summarises the anticipated key future issues and the following sections summarise those issues in more detail.

Figure 3

Key future considerations for the route



3.2 Economic development and surrounding environment

- 3.2.1 A key aspect of managing the route effectively will be ensuring that it is capable of supporting future local housing and economic growth aspirations. This will involve preparing the route through effective management and public investment to be in the best possible position to cater for the planned demands placed upon it, whilst ensuring that the developments themselves effectively mitigate their local impacts.
- 3.2.2 Figure 3 summarises the known key housing and economic growth aspirations that would impact on the route, with Table 3.1 below providing more context about the nature, scale and timing of some of those key developments.
- 3.2.3 Along the route, there are Local Enterprise Partnerships (LEP) in the North East and Cumbria. Neither of these LEPs has a designated Enterprise Zone (EZ) affecting the route.
- 3.2.4 The Newcastle City Region has agreed a City Deal which may have some effect on the route as it includes a commitment to develop a programme of investment to reduce congestion and journey times on the A1 Newcastle and Gateshead Western Bypass.
- 3.2.5 Within section 4, there are a number of areas which were highlighted by stakeholder as significant capacity constraints to economic development along the route. Table 3.1 shows that the focus of employment and housing growth corresponds with the less reliable sections of the route as shown in Table 2.2, particularly to the west of the route.
- 3.2.6 The developments shown in Table 3.1 are located primarily in West Cumbria, near Barrow-in-Furness and around Sellafield, Workington and Whitehaven. Sites include significant housing and employment proposals, the majority of which seek to reuse previously developed sites. Many sites, such as at GSK in Ulverston and Sellafield, are expansion or intensification of use on existing sites bringing inward investment into the area. Others, such as the proposed new nuclear power station at Moorside, near Sellafield, are likely to generate significant numbers of jobs on new sites, both during construction and once operational. Within these locations, the likely impact of development has not been modelled in detail, but it is expected that reliability would worsen, both at junctions on the strategic road network and on local roads.
- 3.2.7 The Cumbria SEP prioritises growth along the M6 corridor, and improving access along the A66 east of Penrith is seen as a requirement to support this. The SEP also prioritises the development of advanced manufacturing in Barrow and South Ulverston, with dualling of the A590 identified as a key requirement to support this as well as the SEP priority aimed at maximising the vibrancy of the rural and visitor economy.
- 3.2.8 As part of the Trans-European Network (TEN-T), the route provides important links for ports on the West Cumbria coast to the wider

strategic road network. Additionally, the route serves Carlisle Airport, and links via the A1 and A696 to Newcastle Airport.

Table 3.1 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	
Barrow Strategic Waterfront	Housing and employment		800 jobs 325 homes	1500 jobs 675 homes	A590 between Park Road and Ulverston
BAE Systems, Barrow	Employment		2000 jobs		A590
South Ulverston (Cumbria CC Strategic Economic Plan aspiration)	Housing and employment		(to 2025) 5.9ha employment land 1161 homes		A590 in Ulverston
GSK Site	Employment		(to 2025) 0.5ha employment land 277 homes		A590 in Ulverston (North Lonsdale Terrace)
Robinson Brewery Site, Ulverston	Food Retail	200 jobs			A590 in Ulverston (Tank Square)
Albion Square, Whitehaven	Employment (Office)	1000 jobs	1200 jobs		A595 near Whitehaven
West Cumbria Strategic Employment Sites	Employment		5550 jobs		A595 from A66 to Sellafield
Moorside new nuclear power station	Employment (construction)		6000 jobs		A595 and A66
Moorside new nuclear power station	Employment (permanent)			800 jobs	A595 and A66
Workington Port	Employment	Not known	200 jobs	Not known	A66 and A595 (Significant due to additional freight)
Dong Energy Walney Extension, Barrow	Employment	Not known	Not known	Not known	A590 (Significant due to additional freight)
Penrith development sites	Housing and employment	Not known	(to 2025) 30ha employment land 2392 homes	2392 houses	A66 Kemplay Bank Roundabout and A66/M6 J40
Mainline Industrial Estate, Milnthorpe	Employment		(to 2025) 8ha employment land		A590 J36

3.3 Network improvements and operational changes

- 3.3.1 The Agency is already delivering a large capital programme of enhancement schemes nationally. This includes Major Schemes greater than £10m in value, plus smaller enhancement schemes including the current Pinch Point Programme. Table 3.2 below summarises the current committed enhancement schemes proposed along the route, which have also been represented on Figure 3.
- 3.3.2 The only major project affecting the route is the upgrade of the A1 to motorway status, which includes development of the A66 Scotch Corner interchange. Other committed improvements on the route are limited to smaller-scale developer promoted schemes or Highways Agency promoted schemes to address safety, congestion or maintenance issues.

Table 3.2 Committed SRN enhancement schemes

Location	Scheme Type	Completion Year	Anticipated Benefits
A1/A66	Major Project – Upgrade of A1 to motorway status including redevelopment of Scotch Corner Interchange	2016	Reduced congestion and improved journey time reliability
A66	LNMS Improvement Scheme - Sedbury (Home Farm) bends, improved road markings and traffic signs	2014	A reduction in Personal Injury Collisions
A66	LNMS Improvement Scheme – Inter Duals Verges Scheme to remove large diameter trees and shrubs from the verge that act as collision obstructions	2014	A reduction in Personal Injury Collisions
A590 Greenodd	Pinch Point Scheme to construct a new roundabout to replace a T-junction	2014	Improved safety
A590 between Barrow-in-Furness and M6 Junction 36	Pinch Point Scheme to improve the provision of information to motorists	2014	Reduce daily congestion, reduce journey times, improve safety.
A595 Mirehouse Road	Pinch Point Scheme to fully signalise the junction to enable development potential to be realised.	2015	Reduce daily congestion, reduce journey times, improve safety.

- 3.3.3 [The 2013 Spending Review](#) and subsequent report from HM Treasury [Investing in Britain's Future](#) referenced a series of potential new pipeline schemes for the strategic road network, as well as listing local transport schemes either completed, under construction or due to start before May 2015.

3.3.4 There are no pipeline schemes for the strategic road network which affect this route.

3.3.5 *Investing in Britain's Future* set out how more than £2 billion per year of funding from across transport, skills and housing budgets will be included in a Single Local Growth Fund (SLGF) to support investment in economic priorities and stimulate growth, with funding allocated to LEPs. In addition, the government is bringing together European Union Structural and Investment funds for 2014 to 2020, with money allocated to LEPs across England. LEPs will be able to use SLGF funds to promote schemes on or affecting the strategic road network where it addresses their strategic priorities.

3.4 Wider transport networks

3.4.1 *Investing in Britain's Future* also listed local transport schemes either completed, under construction or due to start before May 2015. There are no committed local transport schemes which affect this route.

4 Key challenges and opportunities

4.1 Introduction

4.1.1 It is not possible to show all the challenges and opportunities identified in this evidence report. This chapter shows a selection based on those where our internal and external stakeholders viewed these as a priority and these are supported by evidence. A full list of all the identified challenges and opportunities are provided in the Technical Annex.

4.1.2 Figure 4 summarises some of the key issues and challenges that the route will experience during the 5 years from 2015, with the following sections and Table 4.1 explaining them.

Timescales

4.1.3 To understand the timescales of when the key challenges identified become critical and when opportunities on the route could be realised, the following definitions have been made in Table 4.1:

- **Short Term:** current
- **Medium Term:** before March 2021
- **Long Term:** not before 2021

4.1.4 These timescale categories provide a guide for informing when a future intervention may be required to meet anticipated future operational performance needs, or when interventions may be needed to help facilitate local housing and economic growth aspirations.

4.1.5 Many of the issues and opportunities identified in Table 4.1 are already critical and have been identified as existing problems both through our own evidence and by stakeholders. Other identified issues, especially those relating to growth, are dependent to some extent on the rate of development build out.

4.1.6 Interventions to address the issues identified will need time for feasibility assessment and design and therefore, even those issues identified as becoming critical after 2021, may need consideration during the RBS period

Stakeholder Priorities

4.1.7 Input from stakeholder and road user groups linked to the route have been used to inform the development of this evidence report. This included getting their views on what they deemed to be the priorities within their area and identifying their “top priorities” locally. This has been collated according to the route to which those views related.

4.1.8 Table 4.1 presents a summary of whether the challenges and opportunities identified were a priority for our stakeholders in their particular area. This exercise does not seek to prioritise the challenges and opportunities along the length of the route by trying to compare one issue against another, but reports the feedback from local discussions.

- 4.1.9 This picture of stakeholder priorities is subjective and has been informed by discussions regarding the top priorities locally at the stakeholder events, and in conversations with stakeholders who couldn't attend the events.
- 4.1.10 We recognise that the picture we build through this categorisation will be influenced by the representatives and organisations we have engaged with, and that consequently we may not have achieved a statistically balanced view and certain priorities may not have been identified as a "top priority". We will be conscious of the limitations of the reporting of stakeholder priorities as we move into the second stage of RBS.
- 4.1.11 Where stakeholders did not attend the workshop sessions, views were sought through a variety of other existing forums and meetings. Feedback from these stakeholders was therefore also incorporated into Table 4.1.
- 4.1.12 We noticed from the engagement process that stakeholders tended to focus on issues such as safety, providing capacity and network operation. Other categories, such as asset condition, were generally less of a focus for stakeholders, possibly because the condition of our asset (and potential implications of this) is less well understood by stakeholders. As a result, the final prioritisation categories reflect a combination of stakeholder feeling and also our internal knowledge and priorities.
- 4.1.13 The sections below summarise the key issues and opportunities raised through our evidence and the stakeholder engagement process.

4.2 Operational challenges and opportunities

- 4.2.1 The route is not currently patrolled by the Highways Agency Traffic Officer Service, so any incidents which occur on the network require a response by the emergency services or a Highways Agency Tactical Incident Response Team. In addition, there are no permanent variable message signs along the route to inform road users of any incidents or events taking place.
- 4.2.2 The A66 from the M6 to the A1 is located at a particularly high altitude and therefore experiences regular instances where it is closed either to high-sided vehicles or all vehicles e.g. in high winds or severe winter weather. Stakeholders identified as a priority a need to keep this road and other parts of the route susceptible to closure open more often in the event of poor weather.
- 4.2.3 A key issue raised in the stakeholder events related to the planning of roadworks and the diversion routes used when the carriageway is closed, either for maintenance or due to incidents on the network. For routes in Cumbria particularly, diversion routes suitable for strategic traffic are limited and therefore diversions can be extremely long adding significant cost and inconvenience to travellers. Stakeholders also identified the lack of technology provision across the route as a priority, with this impacting both on reliability of journeys and drivers being unaware of approaching incidents and diversions.

- 4.2.4 During the period to 2015, the route will face significant operational challenges associated with the delivery of the committed schemes shown in Table 3.2. Within the affected areas, the primary operational challenge will be to ensure that the route continues to serve the needs of traffic while works are carried out. This will be a particular concern in relation to the A66 in the east at the Scotch Corner junction with the A1, which will be substantially affected by the A1 Leeming to Barton motorway upgrade scheme.
- 4.2.5 As highlighted on Figure 3, the route is affected by significant individual development sites and a general growth in housing and employment, especially towards the west of the route. Certain specific developments provide specific operational challenges, for example on the A595 in Copeland, traffic associated with operations at Sellafield, which directly employs around 10,000 people, causes significant congestion outside the normal morning and evening peak periods. The lack of alternative routes and viable alternative travel options, such as local bus and rail services, combine to result in rapid build-up of congestion when incidents occur.
- 4.2.6 In addition to any additional capacity requirements, it may be necessary to develop a new operational approach to this part of the network to cope with planned increased capacity at Sellafield and in the wider area, as well as jobs, freight and abnormal load movements generated by the proposed Moorside power station.
- 4.2.7 On the A590 in Ulverston, the effective operation of the route is impacted by the conflicts between local and strategic traffic. This includes delays at signals and access problems on approach routes which contribute to delay and poor reliability. Planned developments in and around Ulverston may contribute to these problems without intervention, while there is potential for the construction of the Walney Windfarm Extension to generate significant extra HGV trips associated with the movement of bulk aggregates from Port of Barrow.
- 4.2.8 Also on the A590, local economic development organisations have identified the need to move specialist equipment along the route as abnormal indivisible loads to support the development of industrial processes in Barrow. This may require amendments to roundabout junctions, as well as the replacement or relocation of road signs, lighting columns and other roadside furniture.
- 4.2.9 Across the route as a whole, there are a number of local roads which provide a similar function to those which form part of the route. This includes roads such as the A595 between Cockermouth and Carlisle, the A596 between Workington and Carlisle, and the A689 from the M6 at junction 44 to the A69 at Brampton to the east and the A595 to the south-west. Working with Cumbria County Council and the district authorities, there may be an opportunity to increase reliability on the route by supporting enhancements to these and other roads providing a similar function.

4.3 Asset condition challenges and opportunities

- 4.3.1 In the period to 2021 there are very significant asset condition challenges which will need to be addressed throughout the length of the route. As detailed in Section 2.3, a very large proportion of the surface will require replacement by 2021. The primary issue raised by stakeholders in relation to the condition of the asset related to surface condition. Particular issues raised related to the apparent inconsistency of maintenance on the A69, with a higher standard experienced to the east than to the west, and the poor quality of the surface on the A590 at Lindal Hill.
- 4.3.2 To the north of the route particularly, maintenance records show that the thin surface course system installed under the current standard tends to deteriorate at a much faster rate than was expected. Preliminary studies suggest that this is in part due to low winter temperatures, which causes the binding material to become brittle and more prone to breaking up under normal traffic flows. There may in future be an opportunity to consider reintroducing hot-rolled asphalt in areas of low noise sensitivity, as this type of surface does not suffer in the same way.
- 4.3.3 There are a number of structures along the route which provide maintenance challenges to 2021 and beyond. Key issues described in Section 2.3 include deteriorating concrete in need of repairs; bearings and expansion joints requiring replacement; deterioration of parapets and failure of bridge deck waterproofing. Some may become critical in the short term, requiring substantial investment in repairs or renewal.
- 4.3.4 A further significant issue affecting many areas of the network relates to the condition and capacity of existing drainage systems, which are impacted both by changes to the network and changing weather patterns. In a number of locations such as on the A66 at Ravensworth flooding events are occurring more frequently and causing significant disruption to road users.
- 4.3.5 Renewal of the network, including fixtures such as signage and lighting, will normally be in accordance with our published standards current at the time. However, we take account of ecology and landscape designations and other environmental concerns when planning works to ensure that they enhance rather than detract from the existing situation.

4.4 Capacity challenges and opportunities

- 4.4.1 The route is an important west to east corridor, and serves a range of purposes through its length which are described in Chapter 1 and Chapter 3. Ensuring that the route provides sufficient capacity to accommodate existing uses while supporting economic growth is one of the fundamental priorities for local authorities and other stakeholders across the whole route. All of the developments shown in Table 3.1 are identified by stakeholders as having the potential to impact significantly on capacity.
- 4.4.2 With much of the route being single-carriageway, concerns were expressed across the route as a whole about the lack of overtaking

opportunities and the impact of this upon reliability of journey times. Additionally, accommodating the needs of tourism while meeting those of local residents and businesses was seen as a high priority.

- 4.4.3 Within the stakeholder events, several key sections of the route were identified as particular capacity constraints. The A590 between Newby Bridge and Barrow-in-Furness, passing through Ulverston, was given significant weight by attendees due to its importance to the future of development of advanced manufacturing in Barrow-in-Furness and Ulverston. While this section is not identified within Table 2.2 as among the most unreliable sections on the route, stakeholders described this section as unreliable with regular peak hour delays which are expected to be exacerbated by development at key sites in Barrow and Ulverston.
- 4.4.4 Significant weight was also given to the capacity of the A595, which is identified as among the most unreliable sections of the route in Table 2.2 and which is expected to be the focus of significant development, both at Sellafield and in Whitehaven Town Centre. The proposal for a new nuclear power station site at Moorside which neighbours Sellafield is also likely to significantly impact on the route, with capacity constraints seen as impacting not just on the local economy but on the energy security and economic growth of the country. Stakeholders were concerned that Figure 2.1 and Figure 2.2 fail to adequately show the problems on the route due to impacts outside normal peak periods.
- 4.4.5 On the A66 and A69 east of the M6, there were fewer capacity concerns expressed overall. However, stakeholders gave particular weight to dealing with capacity pressures on the A66 at Kirby Thore, particularly for vehicles joining and leaving the A66 at Main Street in the village.

4.5 Safety challenges and opportunities

- 4.5.1 As identified in section 2.2, the route does not have any locations ranked within the top 250 nationally for injury collisions. However, there are a number of sections of route with high rates of injury collisions, and these will be the focus of activities to improve safety on the route.
- 4.5.2 The main safety issue raised by stakeholders related to the dangers associated with overtaking on single carriageway sections of road. When this is compared to locations with high collision rates, such as on the A590 between Newby Bridge and Ulverston, the A595 between Sellafield and Whitehaven and the A66 between Cockermouth and Keswick, there is close correlation between single carriageway roads and high collision rates along the route. Stakeholders particularly raised this as an issue in relation to heavy commercial vehicles, agricultural vehicles and caravans.
- 4.5.3 The other key safety concern raised by stakeholders is the safety for vulnerable users both using and crossing the route. As a route with significant rural sections, there are a number of areas which are heavily used by equestrians and cyclists, and representatives from these groups expressed concern at the lack of adequate facilities for both crossing and travelling along the route. Additionally, in Ulverston on the

A590 and in relation to a number of villages close to the route there were stakeholders who raised the problem of severance on the route.

- 4.5.4 Although not raised by stakeholders, there are a number of other safety issues along the route which are expected to be addressed by work either planned or recently completed. There are several farm accesses on the A66 close to the A1 where accident mitigation schemes are planned to reduce the frequency of collisions, while on the A590 at Newby Bridge a scheme to reduce the risk of land slips was completed in the autumn of 2013.

4.6 Social and environmental challenges and opportunities

- 4.6.1 Section 2.7 describes the main environmental concerns along the route. The route passes a number of locations which are ecologically sensitive, contain culturally important assets, or pass through or close to sites of significant landscape value. Also, there are a number of locations where noise is identified by Defra as requiring mitigation via action plans.
- 4.6.2 Ecological, cultural heritage and landscape assets along the route are issues which must be taken into account when operating the network and planning maintenance or improvement. However, there are often opportunities to enhance or introduce new protection for such assets, for instance by providing additional screening or landscaping or installing wildlife crossings as part of a scheme.
- 4.6.3 For communities along the route, the route is vital to enable them to access services and opportunities. This is particularly important in rural areas along the A66, where alternatives such as public transport may not be available or are of poor standard. Stakeholders therefore identified this as an important consideration when operating and maintaining the route, particularly as diversion routes on some parts of the route can be very long.
- 4.6.4 As described previously, the route is important for leisure users, which includes car-based tourism and cyclists, pedestrians and equestrians. Improving resilience of the network and enhancing facilities for these users has the potential to contribute to the effective operation of the route for all users.

Table 4.1 Schedule of challenges and opportunities

	Location	Description	Is there supporting evidence ?	Timescales			Was this Identified through stakeholder engagement ?	Stakeholder Priorities		
				Short-term	Medium-term	Long-term		Low	Medium	High
Network Operation	A590	Disruption causes delays on the route	Yes	✓			Yes			
	A595 / A596 / A689	Local routes performing SRN functions	No	✓			Yes	✓		
	A66 Kirkby Thore		Yes	✓			Yes			✓
	Whole Network	Winter impacts on route	No				Yes	✓		
	A66		Yes	✓			Yes		✓	
	A66 Bowes	Maintenance causes issues on single carriageway	Yes	✓			Yes	✓		
	A66 / A595 / A590	Diversion routes disrupt local network	Yes	✓			Yes			✓
	Whole Network	Lack of communication between authorities / local council								
	A69		No	✓			Yes		✓	
	Lake District National Park		No	✓			Yes		✓	
	M6	Planning for major events / seasonality	Yes	✓			Yes	✓		
	Cumbria		Yes	✓			Yes		✓	
Whole Network	Defining role of route	No	✓			Yes			✓	
Asset Condition	A590 Millside	Pavement Condition	Yes	✓			Yes	✓		
	Cumbria, (Kirkby Lonsdale)		Yes	✓			Yes			
	A590	Drainage / Land slides	Yes	✓			Yes	✓		
	A66 / A595 / A590	Resilience of road	Yes				Yes		✓	
Capacity	Whole Network	Journey time reliability and lack of technology	No	✓			Yes			✓
	A590		Yes	✓			Yes		✓	
	A69		Yes	✓			Yes	✓		
	A590	Development causes delays due to low capacity	Yes	✓			Yes		✓	
	A595		Yes	✓			Yes	✓		

	Location	Description	Is there supporting evidence ?	Timescales			Was this Identified through stakeholder engagement ?	Stakeholder Priorities		
				Short-term	Medium-term	Long-term		Low	Medium	High
Capacity	Penrith M6 / A66 J40	Development causes delays due to low capacity	Yes			✓	Yes	✓		
	A66 / A69		Yes		✓		Yes	✓		
	Sellafield, Westlakes and National Grid locations, Nationally significant infrastructure projects	Future Development Impacts	Yes	✓	✓	✓	Yes		✓	
	A590	Development constrained by low capacity	Yes	✓			Yes	✓		
	A590 Ulverston	Local network vs Strategic network	Yes	✓			Yes	✓		
	A66 /A69	HGVs on single lane carriageway slowing vehicles	Yes	✓			Yes			✓
	A66	Lack of overtaking opportunities	Yes	✓		✓	Yes	✓		
	Whole Network	Accommodating freight	No	✓			Yes	✓		
Safety	A66	HGV Speeding on single lane sections	Yes	✓			Yes	✓		
	A66	Lack of routes / crossings for vulnerable users	Yes				Yes	✓		
	Cumbria		Yes				Yes	✓		
	A66 Melsonby	Collisions at grade crossings	No	✓			Yes	✓		
	M6 J34	Junction dangerous	Yes	✓			Yes	✓		
	A66 / A590	Dual / Single carriageway alternation	Yes	✓			Yes			✓
	M6	Inconsistency of speed limits	Yes	✓			Yes	✓		
	A590	Vehicle collisions	Yes	✓			No		✓	
	A595		Yes	✓			No		✓	
	A66		Yes	✓			No		✓	
	A66 (between A67 / A1)		Yes	✓			No		✓	
	A69		Yes	✓			No		✓	
	A595 Keswick and Bassenthwaite	Dangerous overtaking and manoeuvres due to HGVs	Yes	✓			Yes	✓		
	A66		No	✓			Yes		✓	

	Location	Description	Is there supporting evidence ?	Timescales			Was this Identified through stakeholder engagement ?	Stakeholder Priorities		
				Short-term	Medium-term	Long-term		Low	Medium	High
Safety	A66 / A595 / A590	Severance	Yes	✓			Yes		✓	
	A69 at Carlisle		Yes	✓			Yes	✓		
Social and environment	A590 Backbarrow	Noise	Yes	✓			Yes	✓		
	M6 J35 - 36		Yes	✓			Yes	✓		
	A590 Newby Bridge	Drainage / Land slides	Yes	✓			Yes	✓		
	Lake District National Park	Habitat	Yes	✓			Yes	✓		
	A66 between M6 and A1	Wind	Yes	✓			No			
	Whole Network	Flooding	No				Yes	✓		
	A66 Ravensworth		No	✓			Yes	✓		
	A590 Low Field Bridge		No	✓			No			

4.7 Conclusion

4.7.1 The evidence compiled about the route has shown that:

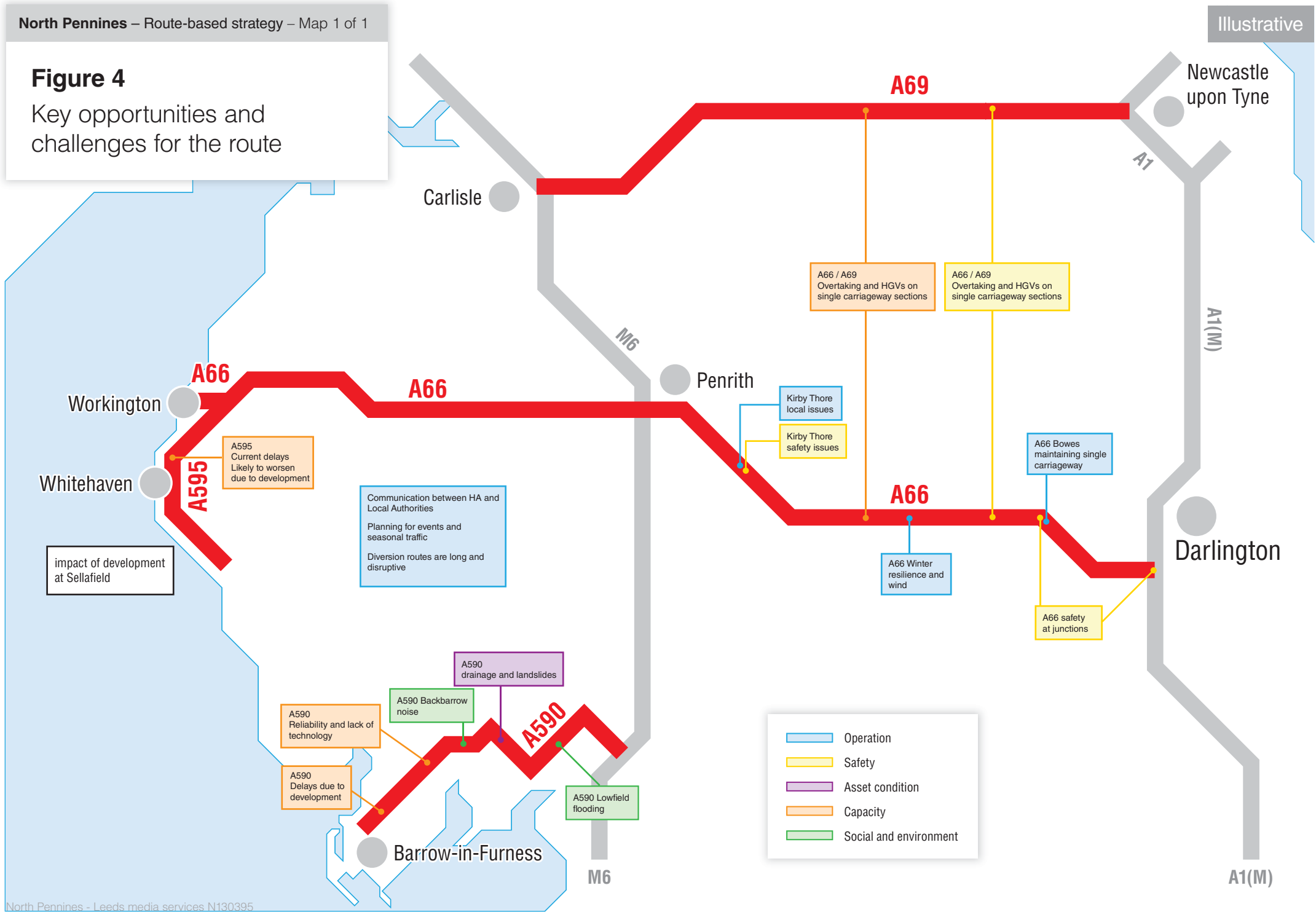
- The A595 and A590 in Cumbria are likely to be the major focus for economic development on the route with the expansion of activities related to energy generation along the 'Energy Coast', including the construction of a new nuclear power station at Moorside. The A590 is also likely to be a focus of employment and housing development, with port operations and advanced manufacturing increasing in Barrow-in-Furness and Ulverston. Both sections of the route already experience some performance issues including delay and low peak hour speeds. Without any interventions, planned development is likely to result in further deterioration in network performance.
- Penrith is expected to see significant housing and employment growth in the local plan period to 2025, which has the potential to impact on the A66, particularly at its junction with the M6. The A66 around Penrith and to the Cumbria coast is the main link for the A595 to the wider strategic road network, and is additionally subject to seasonal fluctuations in demand related to tourism in the National Park. Stakeholders expressed concerns particularly about the impacts of delays due to incidents and diversions, and the safety of the route.
- Although they are important east-west routes linking the A1 and M6, the A66 east of Penrith and the A69 east of the M6 are unlikely to be the focus of substantial growth in housing and jobs. Both sections tend to have fewer problems with delay and low peak hour speeds than the A595 and A590. The A66 is however particularly susceptible to operational issues and closures as a result of severe weather.
- There will be several pinch point schemes implemented on the A590 and A595 prior to 2015. However, these are unlikely to address all the congestion and safety concerns raised by stakeholders. Particular concerns for stakeholders exist on the A595 around Sellafield and on the A590 in Ulverston. Although there are no major schemes planned for implementation on the route prior to 2021, Cumbria's SEP identifies improvements on the A590 in Ulverston as a high priority. Stakeholders identified the 'expressway' concept introduced in *Action for Roads* as particularly relevant to the A590 and A66.
- The evidence did not identify any locations ranked within the top 250 nationally for injury collisions, although a number of sections of the route were identified as having a high risk of collision. Stakeholders raised some issues related to safety and reliability on single carriageway sections of the A69 and particularly the A66, although these routes generally operate reasonably effectively. However, on the A66 west of the A1, the village of Kirkby Thore is the final settlement yet to be bypassed and presents local

severance difficulties for residents and severe operational issues for British Gypsum which is an important local employer.

- The nature of the route means that it frequently interacts with communities and vulnerable users. There are a number of National Cycle Network routes which interact with the route, along with various public footpaths and bridleways which either run parallel or cross the route. The standard of provision for vulnerable users is an issue which was highlighted by stakeholders and enhancement of facilities has the potential to make a positive contribution to the experience of vulnerable users including the many tourists who use the route.
- The route is not currently patrolled by the Traffic Officer Service and there are no plans for the operational coverage of the service to expand to this route. This can make incident management on the route a particular challenge which is likely to become more significant if traffic grows along the route. The lack of technology provision on the route can also make incident management more difficult and this was highlighted by stakeholders as a priority. The impact of incidents on the route can also be particularly problematic due to the limited number of diversion routes available to strategic traffic. The length of diversion routes and the disruption to the local road network were also issues identified by stakeholders.
- The key maintenance related challenges on the route relate to the rapid deterioration of TSCS surfaces due to the impacts of regular low temperatures, and rapid deterioration of structures due to the exposed geographical location and often severe weather.

Figure 4

Key opportunities and challenges for the route



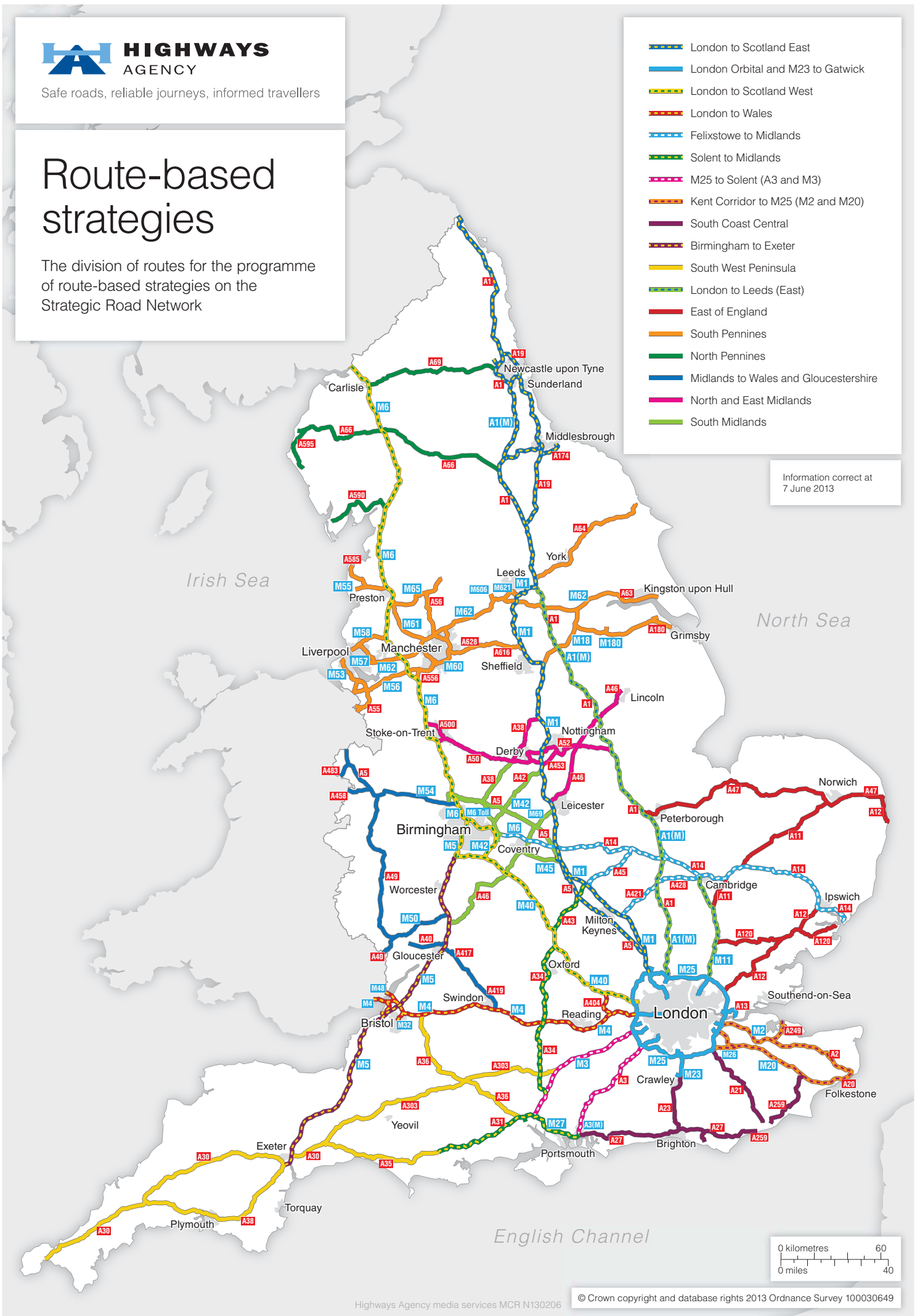
Appendix A Route map

Route-based strategies

The division of routes for the programme of route-based strategies on the Strategic Road Network

- London to Scotland East
- London Orbital and M23 to Gatwick
- London to Scotland West
- London to Wales
- Felixstowe to Midlands
- Solent to Midlands
- M25 to Solent (A3 and M3)
- Kent Corridor to M25 (M2 and M20)
- South Coast Central
- Birmingham to Exeter
- South West Peninsula
- London to Leeds (East)
- East of England
- South Pennines
- North Pennines
- Midlands to Wales and Gloucestershire
- North and East Midlands
- South Midlands

Information correct at
7 June 2013



Appendix B Glossary

Abbreviation	Description
AADT	Annual Average Daily Traffic – for the purpose of this report data is directional.
AONB	Area of Outstanding Natural Beauty
AQMA	Air Quality Management Area
CCTV	Closed Circuit Television
DBFO	Design, build, finance and operate. This refers to roads which were constructed under the private finance initiative.
Defra	Department for the Environment, Food and Rural Affairs
DfT	Department for Transport
FPL	Important Area with First Priority Location. Area identified as an Important Area by Defra which additionally experiences noise of 76dB or higher.
HRA	Hot-rolled asphalt. This refers to road surfaces constructed of bitumen-based asphalt with stone chips rolled into it.
IA	Important Area. Area identified by Defra as being among the 1% of residential sites most affected by noise.
LA	Local Authority
LEP	Local Enterprise Partnership
LNMS	Local Network Management Schemes
MIDAS	Motorway Incident Detection and Automatic Signalling
Ramsar	Protected wetland sites of international importance, designated under the Ramsar convention,
RBS	Route-based strategy
SAC	Special Area of Conservation. Protected habitat site.
SEP	Strategic Economic Plan. Published by Local Enterprise Partnerships setting out economic priorities
SPA	Special Protection Area. Areas of land, water or sea which have been identified as being of international importance for the breeding, feeding, wintering or the migration of rare and vulnerable species of birds
SRN	Strategic Road Network
SSSI	Site of Special Scientific Interest. Environmental designation.
TEN-T	Trans European Transport Networks

Abbreviation	Description
TSCS	Thin surface course system. This refers to surface course materials that are laid at a thickness less than 50mm and which provide a high performance, rut resistant, low noise and skid resistant layer that supports the high volume of traffic found on the strategic road network.
VMS	Variable message signs. Signs on which the message can be changed electronically, either as a light matrix or using rotating planks to switch between one or more defined messages.

Appendix C Stakeholder involvement

Some stakeholders who were unable to attend the events separately provided feedback.

Name	Organisation	Attended
Chris Clouter	ABP Port of Barrow	N
Graham Hale	Allerdale Borough Council	N
Steven McCloy	ARUP	Y
Peter Webster	ARUP (GSK)	Y
Hilary Knox	Association of North East Councils	N
Neil Raper	Autolink	Y
Jackie Arnold	BAE Systems Cumbria	N
Steve Solsby	Barrow Borough Council	N
Kevin Storey	British Gypsum	Y
Helen Kerry	British Horse Society	Y
Kathy Atkinson	British Horse Society	Y
Jane Meek	Carlisle City Council	N
Douglas Kell	CECA (North East)	Y
David Laux	City of Sunderland	Y
Lynn Cramman	Cobalt Park	Y
Chris Hoban	Copeland	Y
John Groves	Copeland Borough Council	N
John Pearson	Cumbria	Y
Andrew Harper	Cumbria	Y
Mike Foster	Cumbria	Y
Rob Lewis	Cumbria	Y
Rob Johnston	Cumbria Chamber of Commerce and Industry	N
Andrew Moss	Cumbria LTB	N
Richard Greenwood	Cumbria Tourism	Y
Mark Duggleby	DfT	Y
Alistair Speedie	Dumfries and Galloway Council	N
Dave Wafer	Durham County Council	Y
Adrian White	Durham County Council	N
	Durham University	N
Paul Fellows	Eden District Council	Y
Gwyn Clark	Eden District Council	N
Rob Carr	Environment Agency	Y
	Federation of Small Business	N
Kate Willshaw	Friends of the Lake District	Y
Stuart Klosinsky	Furness Enterprise	Y
Harry Knowles	Furness Enterprise	N
Nick Clennett	Gateshead Council	Y
Andrew Haysay	Gateshead Council	N
Pat McIver	GlaxoSmithkline	N

Name	Organisation	Attended
Jonathan Reade	Highways Agency	Y
Peter Jordan	Housebuilders Association	N
Simon Woods	Kimberly-Clark	N
Ross Nicolson	Kingmoor Park	N
Chris Warren	Lake District NPA	N
Stuart Walker	McBride	N
Simon Tucker	Metrocentre	Y
Paul Bentley	Metrocentre	Y
Steve Beverley	Metrocentre	N
Mike Sanderson	National Farmers Union	Y
Sarah Green	NE CBI	N
Heather Evans	NE Cycle Touring Club	Y
	NE Regional Freight Council	N
Nick Best	NECTAR	Y
Graeme Mason	Newcastle Airport	N
Harry Emms	Newcastle City Council	Y
Rachelle Forsyth	Newcastle City Council	N
Ray King	Newcastle City Council	N
Ray King	Newcastle City Council	N
Gary MacDonald	Newcastle City Council	N
Tim Townsend	Newcastle University	N
Mark Tewdwr-Jones	Newcastle University	N
Tim Townshend	Newcastle University	N
Helen Matthews	NEXUS	N
Mike Sanderson	NFU	N
Richard Potts	NFU	N
Glen Walker	Nissan	N
Mark Stephenson	North East Chamber of Commerce	N
Jonathan Walker	North East Chamber of Commerce	N
John Cram	North Tyneside Council	Y
Ruth Bendell	Northumberland CC	N
Paul Nicol	Northumberland County Council	Y
Richard McKenzie	Northumberland County Council	Y
	Northumberland NPA	N
Jude Leitch	Northumberland Tourism	N
	Northumbria University	N
Keith Wilson	Port of Tyne Authority	N
Jeff Marriott	RHA Northern Region	N
Malcolm Dodds	RHA Northern Region	N
Trevor Walker	Roadlink (A69) Ltd	N
Rob Dickson	Scottish Borders Council	N
Paul Mair	Sellafield	N
Dan Hudson	South Lakeland District Council	Y
Trevor Male	South Tyneside Council	Y

Name	Organisation	Attended
Neil McPhillips	Stobart Group	N
David Hall	Sustrans	N
Robin Jacobs	Transport Scotland	N
David Hamilton	Transport Scotland	N
Ainslie McLaughlin	Transport Scotland	N
John Collins	Tronic Ltd	N
Ray King	Tyne & Wear UTMC	Y
	Tyne Tunnel Authority	N
John Seagar	UK Land Estates	N
Raymond McGahon	University of Cumbria	N

Additionally, all MPs representing constituencies along or affected by the route were notified of the stakeholder events and invited to provide evidence.

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