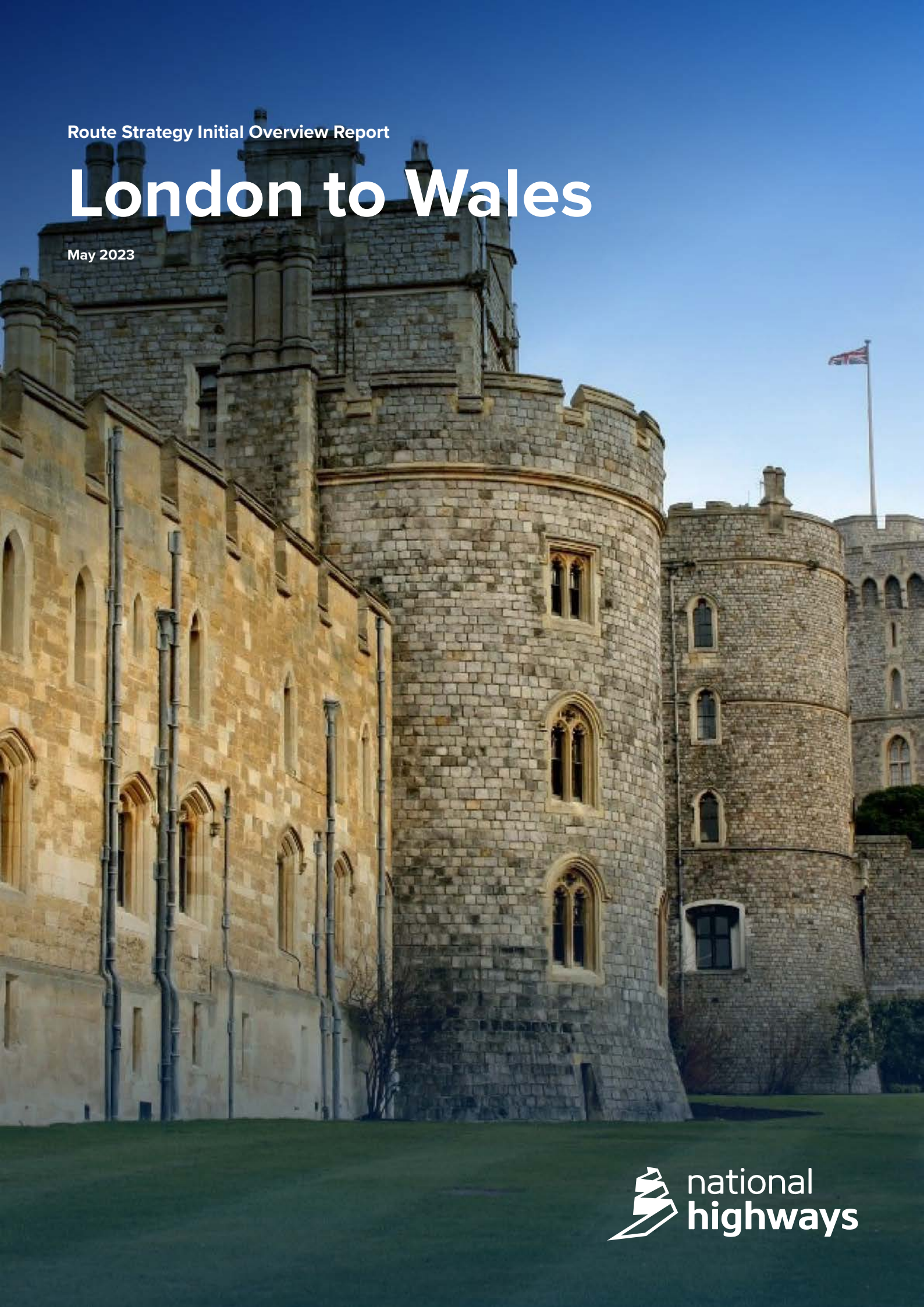
Route Strategy Initial Overview Report

London to Wales

May 2023



national highways

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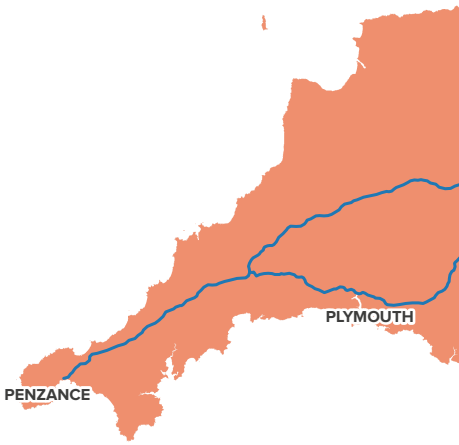
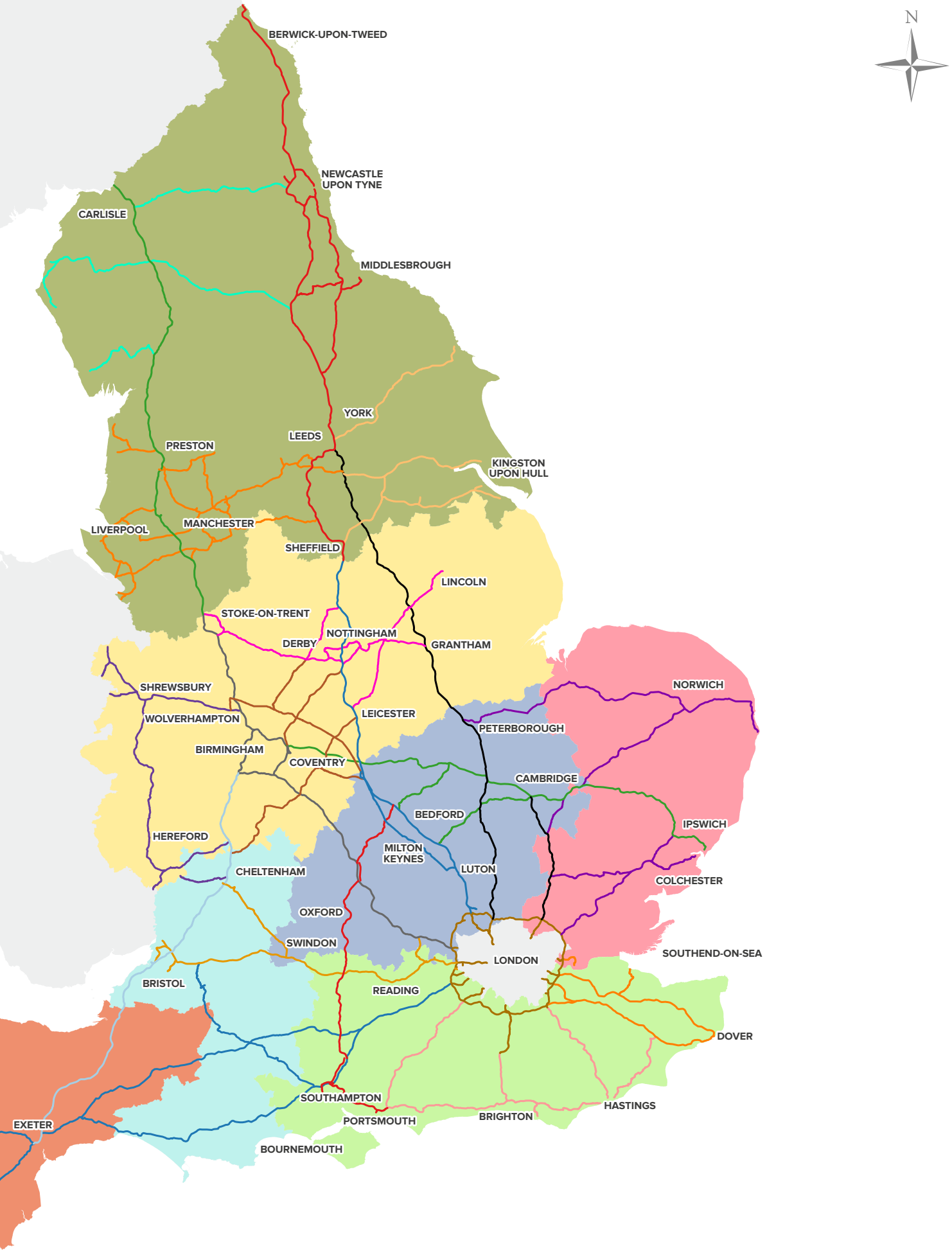
There are 17 routes relating to route strategies across our strategic road network (SRN). To take better account of our customers' end-to-end journeys, we have split some of the longer routes into sub-strategies across 20 reports.

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BERWICK-UPON-TWEED
NEWCASTLE UPON TYNE
CARLISLE
MIDDLESBROUGH
YORK
LEEDS
PRESTON
KINGSTON UPON HULL
LIVERPOOL
MANCHESTER
SHEFFIELD
LINCOLN
STOKE-ON-TRENT
NOTTINGHAM
DERBY
GRANTHAM
NORWICH
SHREWSBURY
WOLVERHAMPTON
LEICESTER
PETERBOROUGH
BIRMINGHAM
COVENTRY
CAMBRIDGE
BEDFORD
IPSWICH
HEREFORD
MILTON KEYNES
LUTON
CHELTENHAM
COLCHESTER
OXFORD
SWINDON
LONDON
SOUTHEND-ON-SEA
BRISTOL
READING
DOVER
SOUTHAMPTON
HASTINGS
BRIGHTON
PORTSMOUTH
EXETER
BOURNEMOUTH

Executive summary

Introduction

Our strategic road network (SRN) is the backbone of the country. Our more than 4,500 miles of of motorways and major A-roads connect people, build communities, create opportunities and help the nation thrive. To plan for the future, we take a long-term view of our network and the trends that could impact transport, road travel, and personal and commercial mobility. Route strategies are at the centre of this dynamic future planning of our network, informing how we operate, maintain and renew our network. This report is the Initial overview report for the London to Wales route and summarises the outcomes of the route strategy. The report builds on the first two rounds of route strategies in 2015 and 2017. It aims to be more forward looking, integrated and collaborative, while being dynamic enough to respond to the future needs of our customers and neighbours.

In this report, we detail the route context, current constraints on the route, and opportunities for improved connections with local roads and rail links. We set out intelligence-led route objectives aligned with the Department for Transport's (DfT) six strategic objectives. These objectives aim to ensure the route can serve its function, while mitigating the identified constraints and challenges. They conclude with locations for further consideration to achieve the route objectives. The route objectives and locations for further consideration will be presented to the Department for Transport to inform future decision-making about investment planning through the Road investment strategy (RIS). It should be recognised that not all aspirations outlined in this report can be funded or delivered.

For clarity, this document does not:

- identify committed schemes for delivery as part of future RIS periods. This will be part of the wider RIS setting process
- commit to the delivery of local plans or economic growth developments mentioned
- guarantee funding for any locations identified for further studying to understand the challenges and issues in more detail
- preclude the inclusion of other locations for consideration in the light of other evidence or imperatives

DFT'S SIX STRATEGIC OBJECTIVES FOR THE STRATEGIC ROAD NETWORK

- Improving safety for all
- Network performance
- Improved environmental outcomes
- Growing the economy
- Managing and planning the SRN for the future
- A technology-enabled network

Customers and neighbours

Engagement with our customers and neighbours has been central to developing our route strategies. We have already gathered a wealth of evidence from the previous rounds of route strategies and through our ongoing monitoring of road condition and performance.

Our performance is monitored through the National Highways' Performance Framework. This Performance Framework was established at the start of the second road period (2020 – 2025) and sets out National Highways' commitments to 2025.

It is outlined in the RIS2 *Delivery plan (2020-2025)*[1]. We will continue this monitoring approach into the third road period (2025 – 2030).

To add to this existing evidence, we carried out a detailed engagement programme for this round of route strategies to understand the current and future needs of those using and living alongside the SRN.

The route

The London to Wales route is a key east-west link on the SRN in the south of England, extending for approximately 170 miles. It runs from the M25, passing through several counties, from Greater London in the east through to the west of England and the River Severn crossings at the border with Wales.

Challenges and issues

We have identified challenges and issues of those using the route and living alongside it. These correspond to the DfT's six strategic objectives, which are the strategic objectives for RIS3. They were agreed by National Highways and DfT, and are set out in the RIS3 *Planning ahead for the Strategic Road Network*[2] document in December 2021.

Improving safety for all

The route as a whole performs well from a safety perspective, however, there remain sections of the route where people have been killed or seriously injured.

Network performance

Sections of the route experience congestion, traffic delay and unreliable journey times, particularly on the M4 approaching London, M32, A417, A419 and A404.

Improved environmental outcomes

The M4 passes through rural areas and also serves urban areas leading to air quality and noise impacts on local communities. The route also passes through and adjacent to Air Quality Management Areas (AQMAs) and Noise Important Areas (NIAs). Particular areas of poor air quality and noise levels include the M32 in Bristol, the A419 around Swindon, the A404(M) and eastern sections of the M4.

Growing the economy

The route connects areas of major development, including Enterprise Zones and International Gateways. Key challenges include sustainable development where growth is anticipated including Reading, Maidenhead, Swindon, the Greater Bristol area, Cheltenham, Gloucester and Wokingham. A key challenge for the route will be to accommodate sustainable development and increasing demands for freight movement, whilst maintaining the strategic function of the route.

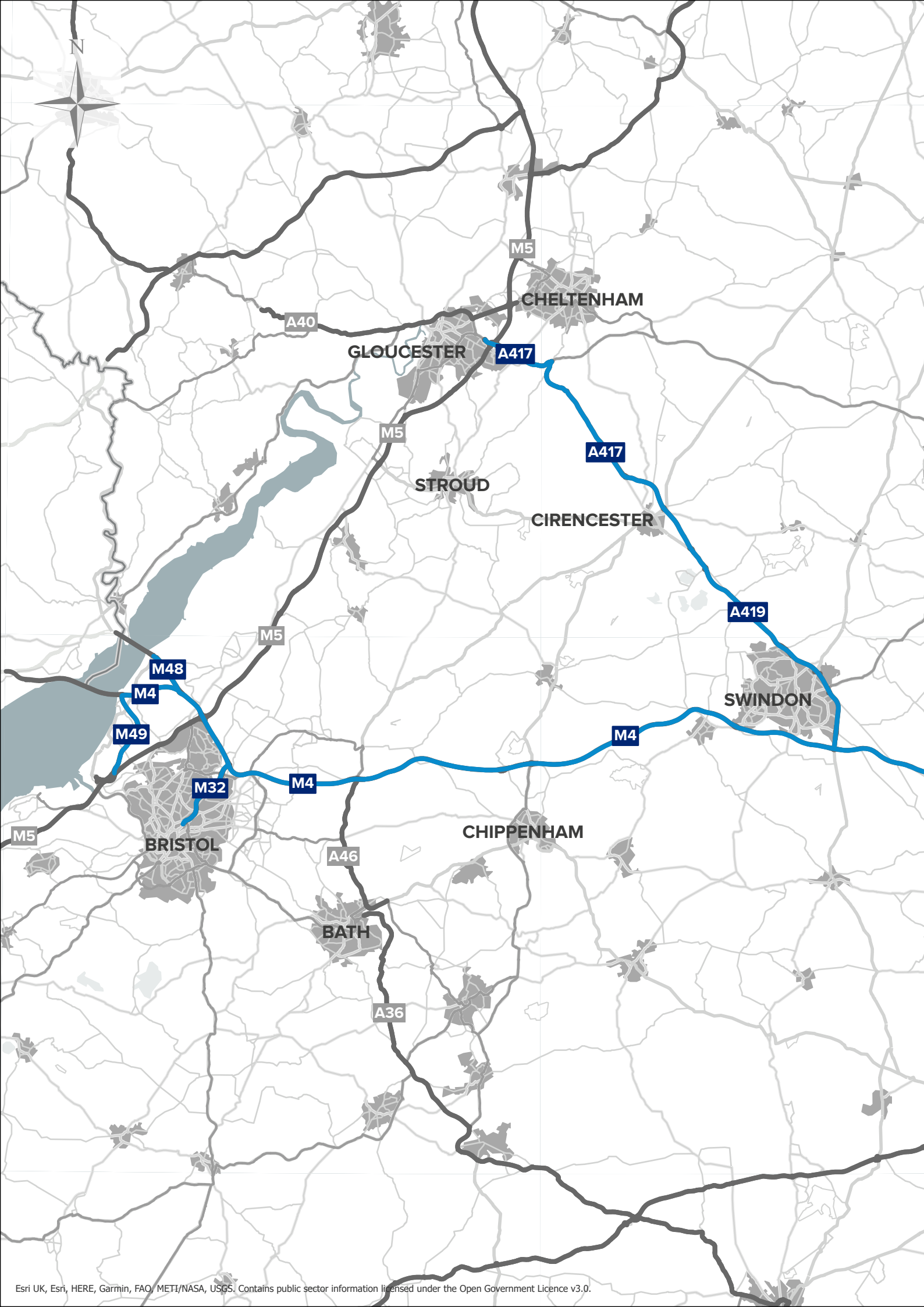
Managing and planning the SRN for the future

The road surface, earthworks, structures and drainage assets along the route are generally in good condition. Nevertheless, to enhance route resilience, we have identified significant structures renewals for RIS3, and these schemes affect 14 structures along this route.

A technology-enabled network

Technology in the future will have an increasing role to play in the provision of information and incident management, including variable message signage. Road information for road users could enable improved route management in instances of incidents and events. It is also critical that the route enables increased electric vehicle use and the expected uptake of alternative fuel vehicles such as those powered by Hydrogen.

1 Highways England, *Delivery plan 2020 – 2025*, https://nationalhighways.co.uk/media/vh0byhfl/5-year-delivery-plan-2020-2025-final.pdf
2 Department for Transport, December 2021, *Planning ahead for the Strategic Road Network: Developing the third Road Investment Strategy,* https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1045938/planning-ahead-for-the-strategic-road-network-developing-the-third-road-investment-strategy.pdf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CHIPPENHAM
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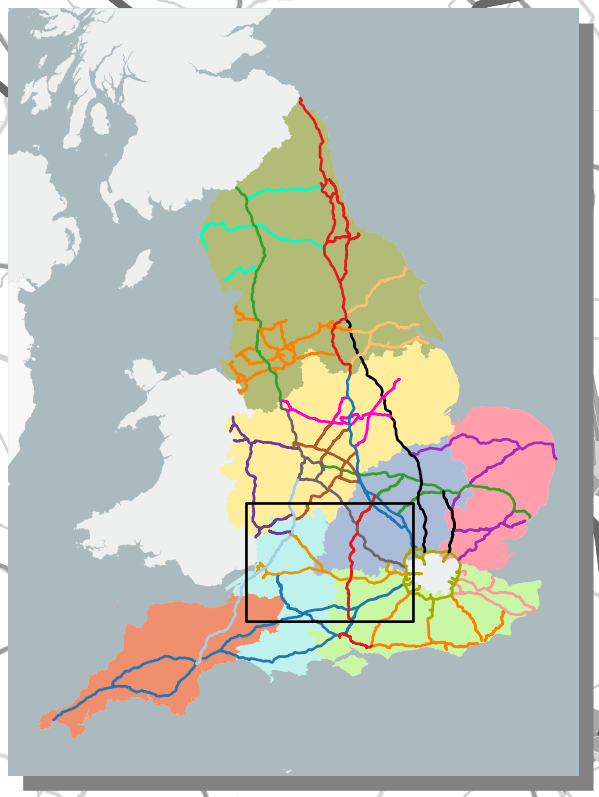

M40
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SLOUGH
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READING
BRACKNELL
M25
NEWBURY
WOKING
A34
M3
FARNBOROUGH
BASINGSTOKE

London to Wales route
SRN
MRN
Local roads

Initial route objectives

We want to provide safer and more reliable journeys for all those who use or live alongside our network, and support the route in achieving the economic and housing growth ambitions of surrounding areas. Based on our engagement and data analysis, we have defined a set of objectives for the route. The table below shows the route objectives and how they contribute to the DfT's six strategic objectives for the SRN as a whole.

		DfT's strategic objectives for our network					
Ref.	**Route objective**	**Improve safety for all**	**Network performance**	**Improved environmental outcomes**	**Growing the economy**	**Managing and planning the SRN for the future**	**A technology-enabled network**
A	**Safe and reliable journeys** Provide safe and reliable journeys through provision of a resilient and consistent route particularly on the M4 in the Berkshire authorities, Bristol, and the A417.	✓	✓				
B	**Strategic connectivity and access to key gateways** Promote strategic connectivity between England (M49, M4, M48, M5 and M32) and South Wales as well as facilitating efficient access to key gateways at Heathrow Airport, Port of Bristol and Bristol Airport.		✓		✓		
C	**Support regionally significant and sustainable economic development in the Berkshire authorities, Swindon and Bristol** Support the delivery of regionally significant and sustainable economic development in the Berkshire authorities, Swindon and Bristol whilst maintaining the safe and effective operation of the network.		✓		✓		
D	**Support local connections and integration** Support effective local connections and integration with other transport modes to reduce short- distance travel demands on the SRN and promote the transfer to alternative modes of transport and reduce carbon particularly in the Berkshire authorities, Bristol and Swindon.		✓		✓		✓
E	**Support the needs of the freight sector** Support regional and national economies through the efficient movement of freight on the M4 and A417/A419, by enhancing lorry parking and driver facilities along with the transfer of freight to alternative modes, where appropriate.		✓		✓		
F	**Reduce adverse impacts on communities** To be a better neighbour by safeguarding the environment and reducing the impacts of severance, adverse air quality and noise on local communities along the M4 in Reading, the M4 and M32 in Bristol and the A417/A419 in Swindon.	✓		✓			

Next steps

The 20 route strategy *Initial overview reports* will combine with other related evidence to inform the broader *SRN initial report*[3] as part of the RIS process for the third road period. The *SRN initial report* includes an assessment of the current state of the network and user needs from it, potential maintenance and enhancement priorities, and future developmental needs and prospects. DfT will consult on this *SRN initial report*, which will serve to inform the RIS and *Strategic business plan*.

We will finalise the *Route strategy reports* following feedback on the publication of these *Initial overview reports.* They will be used as a forward planning tool by National Highways to help identify investment opportunities for enhancements, as well as to support decisions around operating and maintaining our network. Providing an understanding of the strategies for each route will also help inform the decisions taken by our interested parties. These finalised *Route strategy overview* reports will also serve to inform the *Road investment strategy* and *Strategic business plan*.

3 National Highways, 2023, *Strategic Road Network Initial Report,* https://nationalhighways.co.uk/futureroads

Helping the nation to thrive

01 Introduction

Our strategic road network (SRN) is the backbone of the country. Our more than 4,500 miles of motorways and major A-roads connect people, build communities, create opportunities and help the nation thrive.

Our network provides safe, high-speed connections that:

- enable businesses to transport products and services
- provide access to jobs and suppliers
- facilitate trade and investment
- support commercial and housing development that is integrated with local roads and other modes of transport

The SRN also supports leisure journeys, connecting people and places, and will play a central role in delivering the social, economic and environmental needs of the nation, especially as we seek to reduce the carbon footprint of our network.

To plan for the future, we are taking a long-term view of our network and the trends that could impact transport, road travel and personal and commercial mobility. We consider factors ranging from climate change and low-carbon transport to increasing automation, digital technologies and changing travel preferences. Route strategies are at the centre of this dynamic future planning of our network. They build on our *Connecting the country: Our long-term strategic plan to 2050*[4] that sets out our vision and plan for the SRN until 2050, aligning with the Government's *Ten point plan for a green industrial revolution*[5].

Purpose of route strategies

Our route strategies are based on 17 routes across England, with some split into two sub-strategies where this better reflects our customers' end-to-end journeys. There are 20 reports in total. We outline the objectives of each route along with the constraints faced and the current and predicted future performance based on analysis and widespread engagement with our customers and neighbours. Our customers and neighbours include:

- local authorities, devolved administrations, and Sub-national Transport Bodies
- other transport network operators (including local highway authorities, Network Rail, port and airport operators)
- operational partners (including, but not limited to, the emergency services)
- road users
- local communities
- other relevant interested parties with a significant stake in the long-term development of the network
- Members of Parliament

We also provide a list of locations for further consideration to inform investment planning across National Highways and for the Road investment strategy (RIS). We develop and publish these route strategies to:

- help us develop an understanding of the future state of the routes

4 National Highways, 2023, *Connecting the country: Our long-term strategic plan to 2050,* https://nationalhighways.co.uk/futureroads

5 HM Government, November 2020, *The Ten Point Plan for a Green Industrial Revolution Building back better, supporting green jobs, and accelerating our path to net zero*, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/936567/10_POINT_PLAN_BOOKLET.pdf

- identify the locations for further consideration to inform our investment programmes and guide our vision
- give a practical tool to National Highways as a whole, while supporting external interested parties who anchor their infrastructure planning and investment around our network
- help ensure that all investment delivers safer and more reliable journeys for our customers and neighbours

For clarity, this document does not:

- identify committed schemes for delivery as part of future RIS periods. This will be part of the wider RIS setting process
- commit to the delivery of local plans or economic growth developments mentioned
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- preclude the inclusion of other locations for consideration in the light of other evidence or imperatives

Route strategy reports

These *Route strategy initial overview reports* have informed the *SRN initial report*[6] that sets out our vision and proposed priorities for the third road period (2025-2030) and beyond.

The final *Route strategy reports* will be published by the end of the RIS period, which covers 2020-2025. The three delivery phases of route strategies are shown in Figure 1.

Purpose of the report

This report is the *London to Wales route strategy initial overview report.* In this report, we detail the route context, current constraints on the route, and opportunities for improved connections with local roads and rail links. We set out intelligence-led route objectives aligned with the DfT's six strategic objectives. These objectives aim to ensure the route can serve its function, while mitigating the identified constraints and challenges. They conclude with locations for further consideration to achieve the route objectives.

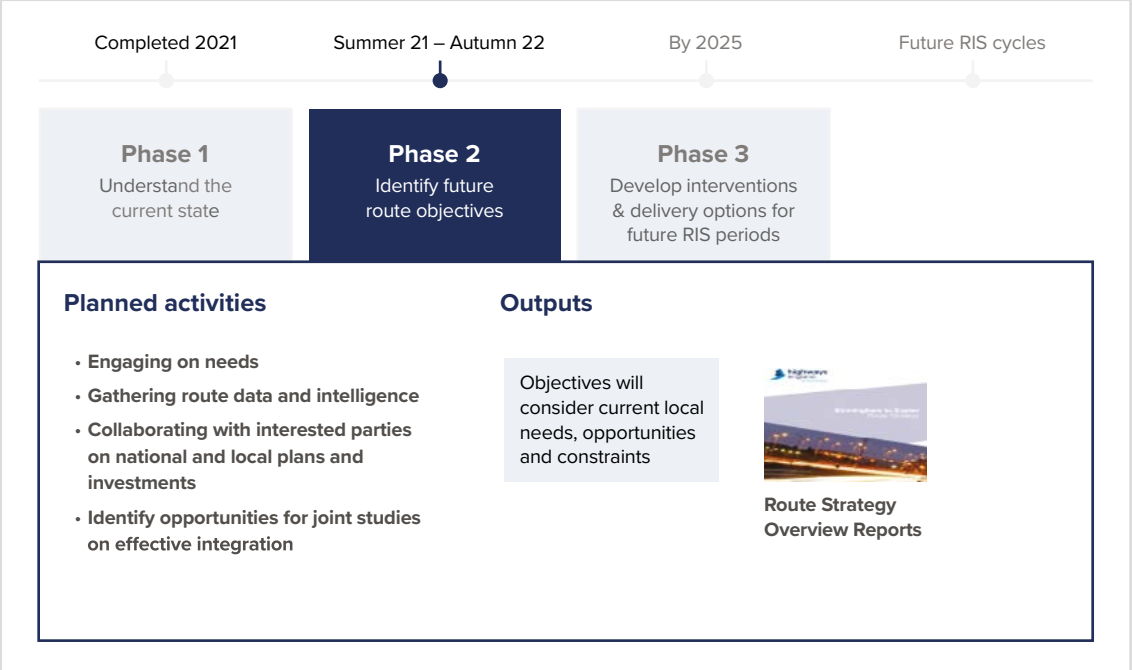


Figure 1: The route strategies delivery phases

6 National Highways, 2023, *Strategic Road Network Initial Report,* https://nationalhighways.co.uk/futureroads

The route objectives and locations for further consideration will be presented to the DfT to inform future decision-making about investment planning through the RIS. It should be recognised that not all aspirations outlined in this report can be funded or delivered

The development cycle for the third Road Investment Strategy (RIS3)

Preparing route strategies is a requirement under the Infrastructure Act as well as a National Highways Licence requirement. The Licence sets out the Secretary of State for Transport's statutory directions and guidance to National Highways. It states that we must periodically prepare and publish route strategies covering the whole of the network to maintain an understanding of how the network is performing, while identifying any potential challenges. Each set of route strategies informs each RIS outlined by government, as well as supporting decision- making for the ongoing management and development of the network.

Route strategies are one of the key steps of research required by DfT to inform the setting of a RIS. Following the setting of RIS1 and RIS2, which covered the first road period (2015-2020) and second road period (2020-2025), we are now in our third round of route strategy planning informing RIS3 for the third road period (2025-2030) and beyond.

Looking across the whole of the SRN, our route strategies form one of the most important parts of the 'research' phase of the third road period development cycle. These strategies explore the current performance and future pressures on every stretch of the SRN, covering matters such as safety, reliability, congestion, environmental impacts, and local ambitions for economic and housing growth. Through the extensive engagement we have undertaken to inform the strategies, we provide insight to DfT and government into local, regional and national priorities for the SRN to support investment decisions for the third road period and beyond. Grounded in evidence, the strategies identify the immediate needs of the network as well as highlighting longer-term issues or potential opportunities as shown in Figure 2.

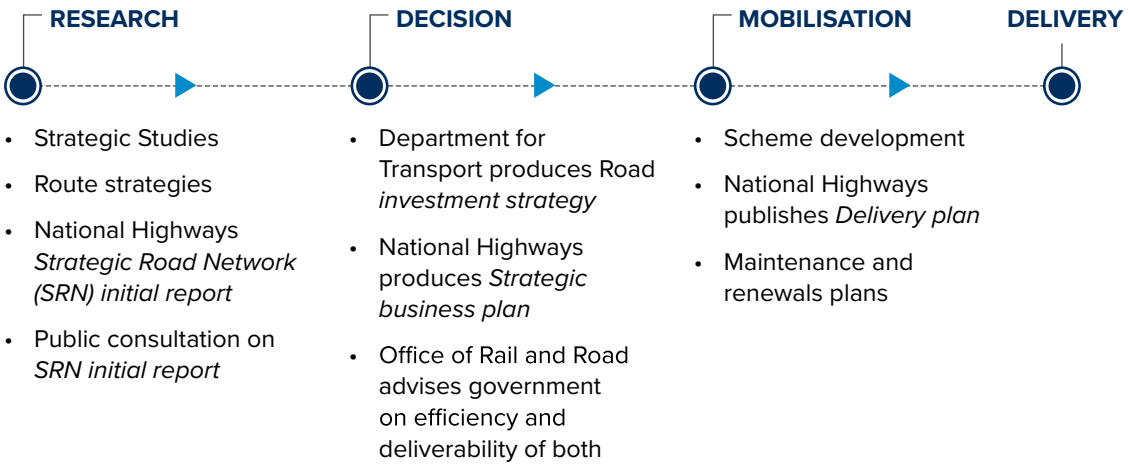


Figure 2: The RIS development cycle

We have developed a revised approach to route strategies, building on past versions, to ensure they respond to the current and future needs of our customers and neighbours. The approach for route strategies is outlined in our approach document *Vision for route strategies: Planning for the future of our roads*[7].

Our ambitions for route strategies, summarised in Figure 3, are to be forward-looking, widely supported, and integrated with other networks and modes of travel. They will consider the implications of local development plans and government ambitions and be dynamic to respond to the changing needs of our customers and neighbours in how they use and interact with our network. Such needs may change as a result of how people use our network due to Covid-19, environment considerations, or the need to support strategic connections and integrated solutions that connect locations all of which will have an influence on the scale and type of future investments. We will work with interested parties to ensure that the route strategies are widely supported and integrated into regional and local strategies.

Engagement with customers and neighbours

Engagement with customers and neighbours has been central to developing our route strategies. We have already gathered a wealth of evidence from the previous rounds of route strategies and through our ongoing monitoring of road condition and performance.

Building on engagement to date, we have worked with Sub-national Transport Bodies, Office of Rail and Road, Department for Transport, and Transport Focus to ensure a diverse range of people and their views are represented. This has allowed us to further improve our understanding of our customers and neighbours' requirements, helping us identify locations for further consideration to improve the SRN.

We will continue to evolve this engagement process for future cycles of route strategies. We used a range of methods to gather information from customers and neighbours throughout the route strategies' evidence collection period, which ran from August to December 2021 (Figure 7). These included round tables, workshops, and an online feedback form and we designed the approach to be more inclusive by engaging with and learning from a wide range of interested parties.

Thinking about how the SRN integrates with the surrounding rail and road network, including parts of the major road network (MRN) and local roads, we designed our engagement around the following objectives:

- to understand the current role of the SRN and how it could better support the aspirations of customers and neighbours of the future
- to gather views and seek evidence on current and future issues, challenges and opportunities – both local and strategic

We have also gained an in-depth understanding of what our road users want nationally from Transport Focus' *Strategic roads user survey 2021/22*[8] into road users' priorities for improvements to journeys on the SRN. This research was based on focus groups and interviews with all types of road users across the country, alongside a survey of more than 5,000 drivers. It asked for users' views on key issues, such as sustainability and electric vehicles, and the stress of driving on the SRN.

From this research, Transport Focus identified that the majority of road users want the focus of investment to be on keeping National Highways' existing roads in good order before building new ones. Their top priority for improvement to journeys on the SRN is road surface quality, followed by the safer design and upkeep of roads.

7 Highways England, 2021, *Vision for route strategies Planning for the future of our roads,* https://nationalhighways.co.uk/media/w0vhd3un/vision-for-route-strategies.pdf

8 Transport Focus, 2022, *Strategic Roads User Survey - 2021/22 Summary Report*, https://www.transportfocus.org.uk/publication/strategic-roads-user-survey-2021-22-summary-report/

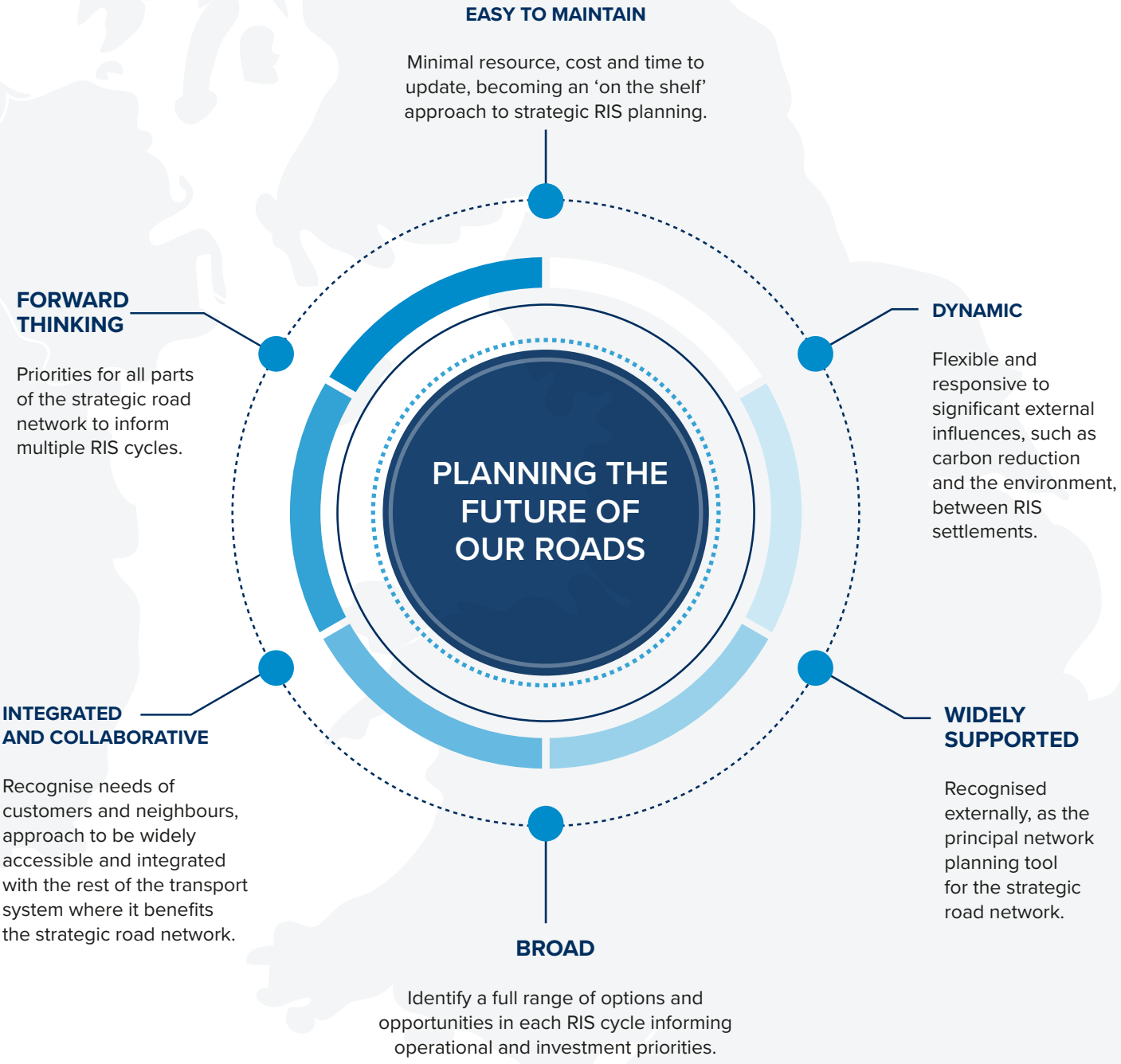


Figure 3: Our ambition for route strategies

Users also want to see better management of roadworks and of unplanned delays, such as incidents or breakdowns, and better information about unplanned disruptions to journeys. Walkers, cyclists and horse riders using the SRN highlighted concerns about the speed of traffic and want action on lighting and litter. This research will be used by Transport Focus to make recommendations about what National Highways should be required to deliver during the third road period.

The findings from the Transport Focus survey align with findings from our route strategies engagement with customers and neighbours across the SRN.

Engagement during workshops with interested parties (shown in Figure 6) identified the following national priorities:

- better driver education aimed at teaching road users about new technology
- deeper consideration of environmental constraints at the earliest stage of planning, and consideration for key environmental issues such as biodiversity, air quality and sustainable transport
- a resilient and reliable SRN to support economic growth
- better integration between the SRN and local road network to improve journey times
- greater support for the freight industry in terms of:
    - the future of low emission vehicles and commercial fleet
    - the impact of congestion on productivity, fuel cost, driver breaks, lorry park locations and delivery times
- greater collaboration and early engagement with interested parties, and greater alignment between network operators, including consideration for joint funding opportunities

In addition, feedback on the SRN provided by communities and neighbours via the online tool, showed similar national priorities. The breakdown of the 1,700 responses we received via the online feedback tool are shown in Figure 4 and Figure 5.

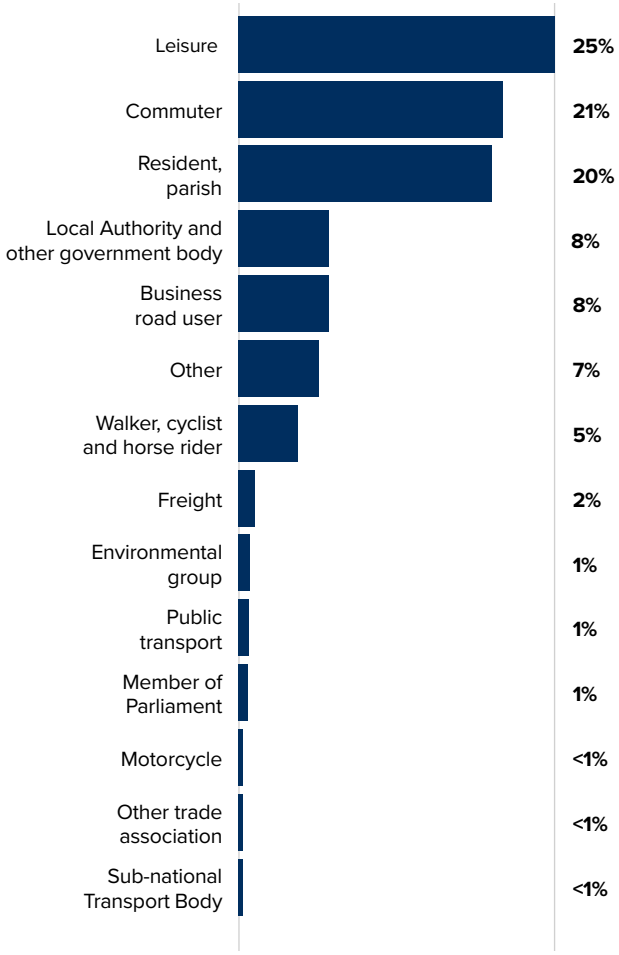


Figure 4: All responses to online tool by participant type

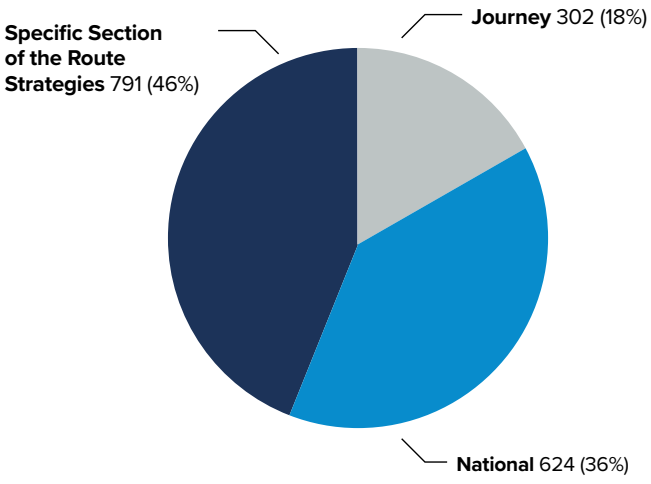


Figure 5: All response to online tool by type

A breakdown of the national issues and general feedback raised is shown in Figure 8, which highlights that, in terms of the issues identified:

- 26% were related to safety
- 23% were related to congestion
- 28% were related to the environment or carbon

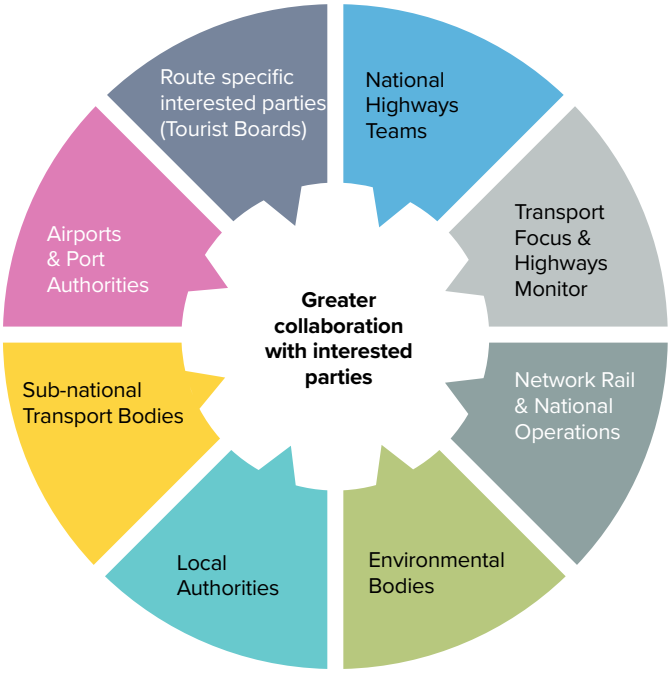


Figure 6: Interested parties involved in the route strategy engagement

Figure 7: Timeline of engagement with interested parties

DfT's strategic objectives for the strategic road network

The DfT have published six objectives for the SRN. These are the strategic objectives for RIS3 (2025-2030) that have been agreed between National Highways and the DfT and were set out in the *RIS3 Planning ahead*[9] document in December 2021. They cover safety, network performance, environment, economy, management and planning for the future and technology.

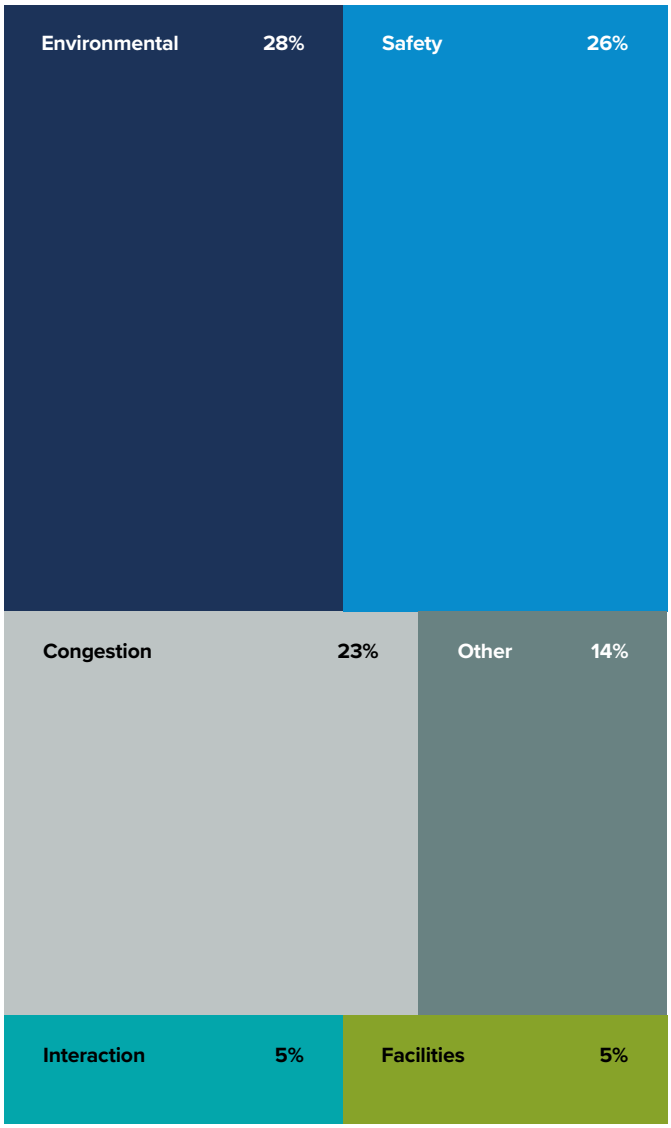


Figure 8: National themes from feedback through the online tool

9 Department for Transport, December 2021, *Planning ahead for the Strategic Road Network: Developing the third Road Investment Strategy,* https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1045938/planning-ahead-for-the-strategic-road-network-developing-the-third-road-investment-strategy.pdf

All our route strategies need to show how they contribute to the delivery of the DfT's six strategic objectives for our network, to ensure we meet future challenges. These help us create relevant, meaningful and effective strategies that address evolving concerns. Such concerns include decarbonisation, ecology, the need for new homes and the desire for a better- connected country.

This aligns with the Infrastructure Act 2015, where National Highways has a statutory obligation to have regard to the effect of its functions on the environment, and the safety of users of highways.

At a national level, National Highways has existing commitments and ambitions to contribute to the DfT's six strategic objectives, as outlined below. The strategies for each route are aligned with these. They include:

i) Improving safety for all

- Our safety approach

ii) Network performance

- expectations over COVID-19 and travel demand
- our ambition for supporting freight, logistics and the coach industry
- our ambition for supporting end-to-end journeys for a variety of modes
- our approach to trunking and de-trunking for SRN

iii) Improved environmental outcomes

- *Net zero highways: Our 2030 / 2040 / 2050 plan*[10]
- Our plan for net zero carbon travel on our roads covering emissions from the vehicles using the SRN
- Our approach to improved environmental outcomes

DFT'S SIX STRATEGIC OBJECTIVES FOR THE STRATEGIC ROAD NETWORK

- Improving safety for all
- Network performance
- Improved environmental outcomes
- Growing the economy
- Managing and planning the SRN for the future
- A technology-enabled network

iv) Growing the economy

- Our contribution to growing the economy and levelling up
- Our approach to spatial planning

v) Managing and planning the SRN of the future

- Our approach to asset management

vi) A technology-enabled network

- Our ambition for digital roads

10 National Highways (2021) *Net zero highways: our 2030 / 2040 / 2050 plan.* https://nationalhighways.co.uk/media/eispcjem/net-zero-highways-our-2030-2040-2050-plan.pdf

IMPROVING SAFETY FOR ALL

OUR SAFETY APPROACH: We are committed to reducing the number of road users killed or seriously injured on the strategic road network, by 50% (from the 2005-2009 baseline) by the end of 2025, with a long-term vision to eliminate harm arising from use of the SRN. We recognise:

- safety is National Highways' top priority. We believe that everyone who travels or works on our roads should get home safe and well.
- billions of miles are travelled on the SRN each year, with the vast majority of these safe and reliable journeys.
- our roads are some of the safest in the world, but we know there is more we can do. Every death or serious injury on our roads is a tragedy and we are committed to creating the safest roads in the world

NETWORK PERFORMANCE

EXPECTATIONS OVER COVID-19 AND TRAVEL DEMAND: COVID-19 has had the biggest single-year impact on road traffic since records began in 1949. But car traffic on the SRN is now back to approximately 95% of pre-pandemic levels.

At the time of writing, while the onset of COVID-19 and the rapid rise in homeworking initially decreased demand for both public and private transport, the greatest impact has been on public transport, with private vehicle travel the first mode to rebound. Homeworking has not noticeably reduced demand for the SRN. An estimated 43% of UK jobs can be done entirely from home, but nearly two-fifths of businesses expect 75% of their workforce to eventually return to their normal place of work.

It is unclear if the scale of homeworking will continue or how it will affect long-term travel demand. For the short-term, transport flow data has generally shown that traffic peaks have become flatter but broader, with traffic more evenly spread across the day, suggesting some behaviour change.

Continued hybrid working could see a redistribution of demand, flattening the daily morning and afternoon peaks, and instead creating a mid-week peak.

The pandemic has also brought wider uncertainties, such as whether these loosened physical ties to employment locations could see increases in suburban living, as workers that are more 'knowledge-based' than 'location based' take advantage of greater geographic mobility across the country.

Changes in leisure trends caused by the pandemic could also have implications for the SRN, such as the changing demand for high street retail or choices around domestic versus overseas holiday-making. Such needs may evolve, all of which will have an influence on the scale and type of future investments.

SUPPORTING FREIGHT, LOGISTICS AND THE COACH INDUSTRY: We continue to collaborate with our freight and logistics customers to better understand how the SRN can support their operations, and work with wider Government in the delivery of their *Future of freight plan*[11]. We recognise that lorry parking and facilities are key to enabling freight and logistics businesses to operate safely and efficiently. A lack of parking and good quality facilities impacts the recruitment and retention of drivers into a sector that is crucial to the country's economy. We are keen to play our part in ensuring good quality facilities are in the right places and that we support the sector in recruiting and retaining a diverse pool of drivers.

Our ambition is to improve lorry parking by:

- intervening where the market is not meeting the demand for lorry parking (areas of high demand with insufficient facilities)
- working with operators to improve the quality of existing facilities
- ensuring our major projects consider the needs of lorry drivers

11 Department for Transport, 2022, *Future of Freight: a long-term plan*, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1085917/future-of-freight-plan.pdf

In addition to supporting lorry parking, we remain focused on:

- reducing congestion on the SRN, which affects the speed, reliability and cost of logistics, as well as driver safety when journeys exceed regulated driving time
- improving the suitability of alternative routes and diversions off the SRN
- supporting the industry in achieving net zero carbon emissions by facilitating the adoption of alternative fuels linked to parking facilities
- ensuring resilience on key freight routes, such as between ports, airports, wharves and rail freight interchanges
- increased data sharing on incidents, roadworks and diversions
- understanding changes in how our freight and logistics customers use the SRN so we can continue to provide the best possible service

IMPROVING END-TO-END JOURNEYS FOR A VARIETY OF MODES: The SRN plays an important role in supporting a wide range of customer journeys by different modes of transport. We are exploring how to support customers' end-to-end journeys by creating travel choices that deliver our target of net zero carbon customer journeys by 2050. We recognise our role in supporting an integrated transport network that allows our current and future customers to re-route, re-time, re-mode and reduce their journeys, especially at peak times and during major disruption.

Through understanding National Highways role in influencing and improving travel, we will identify how to support customers utilise the right mode for the right journey. By working closely with operators, we will ensure our network supports bus and coach services. And through the development of active travel networks we can help deliver health and wider social benefits.

Our focus is on delivering net-zero customer journeys by 2050 through behaviour change towards sustainable travel by:

- understanding travel behaviours to identify customer needs for end-to-end journeys, supporting the development of a travel demand management strategy
- ensuring our customers have the information they need to make the travel choices that are right for them
- improving integration of different modes of travel by working with key interested parties to deliver a range of active travel and public transport interventions
- using behaviour change and techniques to manage future travel demand and minimise disruption from major works
- continuously improving our offer for walkers, cyclists and horse riders

SRN TRUNKING/DETRUNKING: For RIS2, we were asked to explore changes to the SRN to ensure the network aligns with RIS2 strategic priorities, reflected in the *Strategic business plan*. This plan relates to improving connections between main urban centres, to international gateways, to peripheral regions (for levelling up) and strategic cross-border routes (to strengthen union connectivity). It included a commitment to explore potential asset ownership changes between ourselves and local highway authorities that could be implemented no earlier than the start of RIS3. The DfT have produced a shortlist of 18 trunking and two de-trunking candidates, identified following the draft RIS2 public consultation in 2018, for us to assess desirability and viability of asset transfer. De-trunking is the process of returning a National Highways road to the local highway authority control and vice versa for trunking.

These candidates were put forward by a range of external interested parties, including local authorities, Local Enterprise Partnerships and Chambers of Commerce, then shortlisted by the DfT. There is ongoing work to review the assessment evidence and recommendations. By autumn 2022 government ministers are expected to announce the candidates that will progress to the detailed development stage, which will be led by National Highways. Such needs may evolve, all of which will have an influence on the scale and type of future investments.

IMPROVED ENVIRONMENTAL OUTCOMES

NET ZERO HIGHWAYS: NATIONAL HIGHWAYS' *2030/2040/2050 PLAN*[12]. We are committed to being a Net Zero Carbon Company by 2050 (2040 for Maintenance and Construction emissions).

We published our ambitious net zero carbon plan in July 2021. It details how we will achieve net zero emissions for: our corporate space by 2030, our maintenance and construction emissions by 2040, and road user emissions by 2050. We're keen to support a sustainable future and know that road travel is vital to enabling a thriving net zero economy. Our plan strengthens the decarbonisation of the transport sector, which remains the biggest emitting sector of greenhouse gases in the country.

We also need to consider how the SRN will be resilient to climate change. Our route strategies will need to recognise that the schemes we construct are likely to be subjected to changes to the climate, such as flooding.

Our route strategies demonstrate how we will continue to connect the country and ensure that the SRN is environmentally sustainable and resilient to climate change. This includes understanding the right schemes and options that support integration across different modes of travel, improve the SRN's capacity through digital roads, and deliver broader environmental enhancements.

This will change the way we work both internally and with our supply chain and wider interested parties.

As part of our net zero commitment, we need to consider the contribution our schemes make to sustainable development. We are adopting the PAS2080 Carbon Management in Infrastructure Standard that will help us invest only where we can achieve our zero carbon goals. Guided by the PAS2080 Standard, we will use an investment hierarchy where we favour opportunities to deliver whole life value without undertaking construction. We will demonstrate that we have considered all interventions during our planning stages and that every effort is made to avoid negative impacts and maximise environmental benefits throughout the lifecycles of schemes. We will also work with government and the private sector to set out a clear proposition by 2023 for electric vehicle charging on our network. This will cover both customer need and the infrastructure required to deliver this.

More than ever we need to support the Government's wider plans for decarbonising transport. The SRN plays a pivotal role in supporting the transition to zero carbon cars, vans and heavy goods vehicles (HGVs), but we also recognise that we need to better integrate with other modes of transport too, including public transport and active travel.

NET ZERO CARBON TRAVEL ON OUR ROADS COVERING EMISSIONS FROM THE VEHICLES USING THE STRATEGIC ROAD NETWORK: We have set an ambition for all of our customers to be travelling using net zero transport by 2050, in line with the UK Climate Change Act. Many of the actions that will deliver this ambition are out of our direct control, but that does not mean we cannot play our part. Our priorities are to help roll-out solutions to decarbonise HGVs and support the uptake of electric cars and vans. We will also continue our work on integrating the SRN with other transport modes, while working to improve the efficiency of the network.

12 National Highways (2021) *Net zero highways: our 2030 / 2040 / 2050 plan.* https://nationalhighways.co.uk/media/eispcjem/net-zero-highways-our-2030-2040-2050-plan.pdf

Our actions relating to reducing emissions from road users of our network include:

- publishing our proposed approach to zero carbon HGV trials by the end of 2022
- publishing a blueprint for electric vehicle charging services on our roads by 2023
- integrating a strong modal shift programme in the third road period, building on our work to date

IMPROVED ENVIRONMENTAL OUTCOMES: We know there's a requirement to balance people's need to travel on our roads with doing all we can to protect and improve the environment. That means we will continue to consider a wider range of environmental factors in our future planning, such as improving biodiversity, protecting ancient woodlands, reducing pollution in Air Quality Management Areas, and protecting Sites of Special Scientific Interest. These will form part of our considerations during our early planning. In response to these emerging issues, our latest route strategies take a balanced view on expanding the future capacity of the SRN.

We now seek to develop strategies that produce balanced investment plans with schemes of different magnitudes, delivering across multiple objectives: safety, journey time improvements, network resilience, maintenance and renewals, technology, environmental enhancement, and integration with more sustainable transport modes. The outcome will be an SRN that supports the economy but also delivers on the wider environmental challenges.

GROWING THE ECONOMY

GROWING THE ECONOMY AND LEVELLING UP: The SRN is a vital part of England's – and the UK's – transport infrastructure. It facilitates the movement of people and goods nationally, regionally and locally through connections to the Major Road Network and other transport infrastructure. The Government's levelling up agenda places emphasis on ensuring no community is left behind, particularly as we recover from the COVID-19 pandemic. With such a vital role in supporting the economy and facilitating connectivity - enabling access to jobs and homes, international gateways and supporting road-reliant sectors – National Highways and the SRN have a role to play in supporting the levelling up agenda and the wider aim of economic prosperity.

The Government is committed to strengthening transport connections across the UK. Sir Peter Hendy's *Union connectivity review*[13] was published in late 2021. The Review recommends the creation of UKNET, a strategic transport network spanning the entire United Kingdom based on a series of principal transport corridors between key urban and economic centres, including international gateways. The findings of this report have been considered in the context of our route strategies and will be a key objective for our cross-border routes and the roads connecting to important ports.

Additionally, the SRN plays a critical role in enabling international connectivity and trade by providing reliable and resilient access routes to global markets via the country's network of international ports, airports and the Channel Tunnel. Enhancing these links and supporting these gateway locations to thrive, including maximising the opportunities of Freeports, is a key part of National Highways' role in supporting the national economy.

13 Sir Peter Hendy CBE, 2021, *Union Connectivity Review Final Report,* https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1036027/union-connectivity-review-final-report.pdf

SPATIAL PLANNING: We recognise that businesses operate from the location that best suits their business requirements in terms of access to customers, the supply chain and employees. Location is equally critical to decision-making in the residential market, both for the house builder and the potential purchaser or occupier. In enabling new employment spaces and homes to be developed, at National Highways we engage fully and positively as a statutory consultee in the planning system.

This is in line with our statutory responsibilities as set out in our Licence, and in support of wider Government policy and regulation. Our focus is on securing sustainable development, managing cumulative impacts of strategic growth, and minimising the potential for any negative impacts on the SRN.

MANAGING AND PLANNING THE SRN FOR THE FUTURE

We recognise that asset management is our core business. It is the service we provide to maintain, operate, and enhance the SRN safely, reliably and effectively for all our customers. We manage more than 4,500 miles of road, over 20,000 structures and 12 road tunnels, as well as drainage, earthworks, and technology equipment. We recognise that our customers rely on our roads to travel approximately 95 billion miles every year, and our work helps unlock housing and employment sites across the country. One of our main priorities is managing these assets effectively and efficiently, to deliver the outcomes our customers and interested parties want.

We have adopted an asset management approach in order to align our strategy and planning activities to create, maintain, operate, and renew all of the assets that make up our network. Asset management links all our activities and supports our three imperatives: safety, customer service and delivery.

We know that good asset management is about understanding our customers and interested parties, identifying what they need and then using our assets effectively to deliver the right level of service. We are working to understand what satisfies our customers, and what we can do to influence this.

Our vision is to create an approach and establish ways of working that make sure all our asset management activity is aligned by following the key principles set out in our asset management policy. We work across the whole asset lifecycle, understanding that asset decisions we make may affect future service provision. This means that we are planning and accounting for emerging and evolving challenges around customer expectation, climate change and new technology. Since the beginning of the second road period we have continued on our journey to increase our asset management maturity, and our organisational objectives have developed significantly in light of COVID-19 and the Government's carbon plans.

A TECHNOLOGY-ENABLED NETWORK

DIGITAL ROADS: Our ambition for digital roads is to continue to harness data, technology and connectivity of people to places and communities and networks to improve the way the SRN is designed, built, operated and used. Our recently published Digital roads strategy (September 2021)[14] sets out how we will harness data, technology and connectivity to improve the way the SRN is designed, built, operated and used. This will also support our ambitions to achieve net zero carbon on the SRN. We have established three themes: Digital Design and Construction, Digital Operations and Digital for Customer. These themes will continue to frame our vision towards 2030 and beyond, increasing connectivity, automation and data.

14 National Highways, September 2021, *Digital Roads,* https://nationalhighways.co.uk/our-work/digital-data-and-technology/digital-roads/

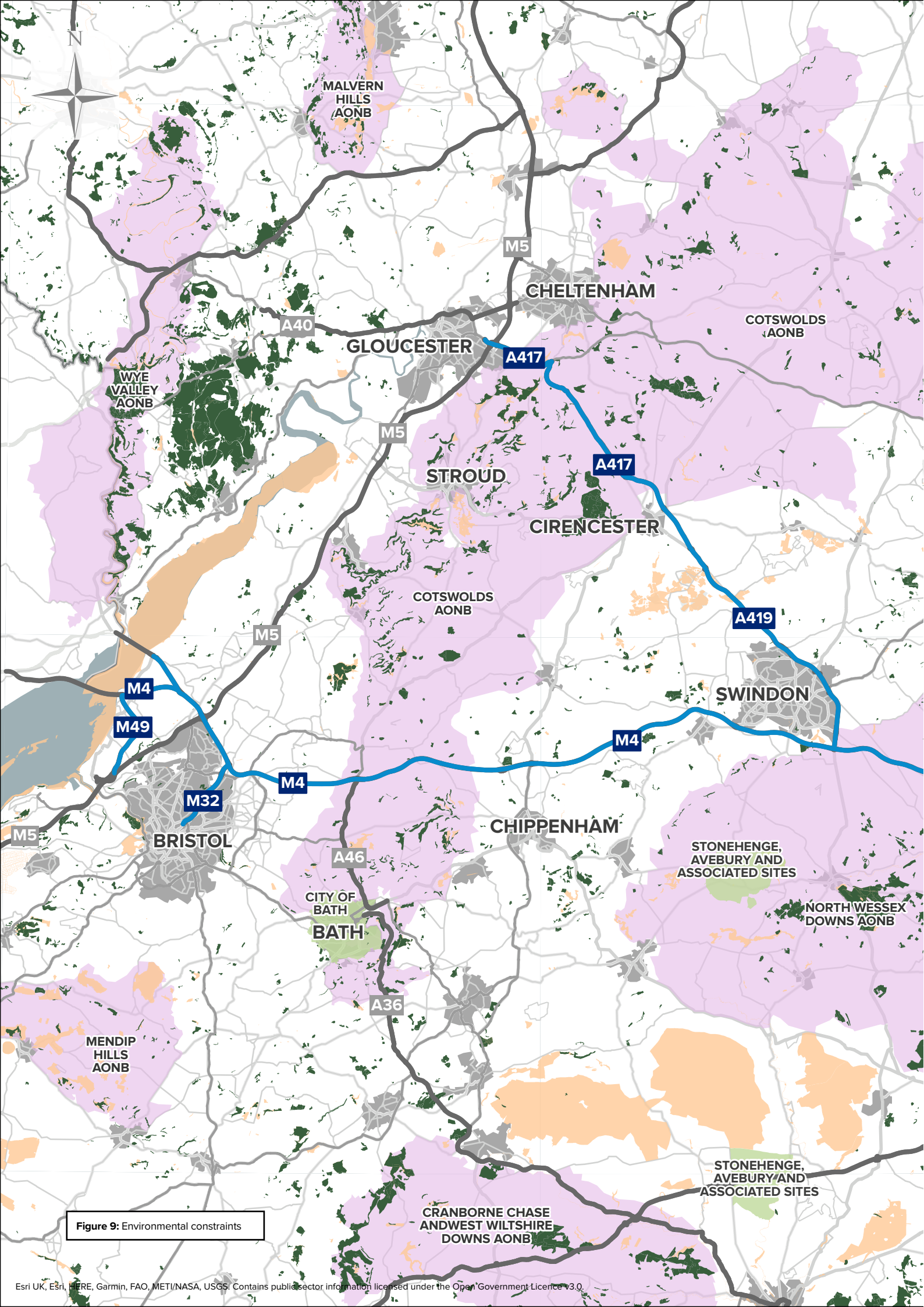
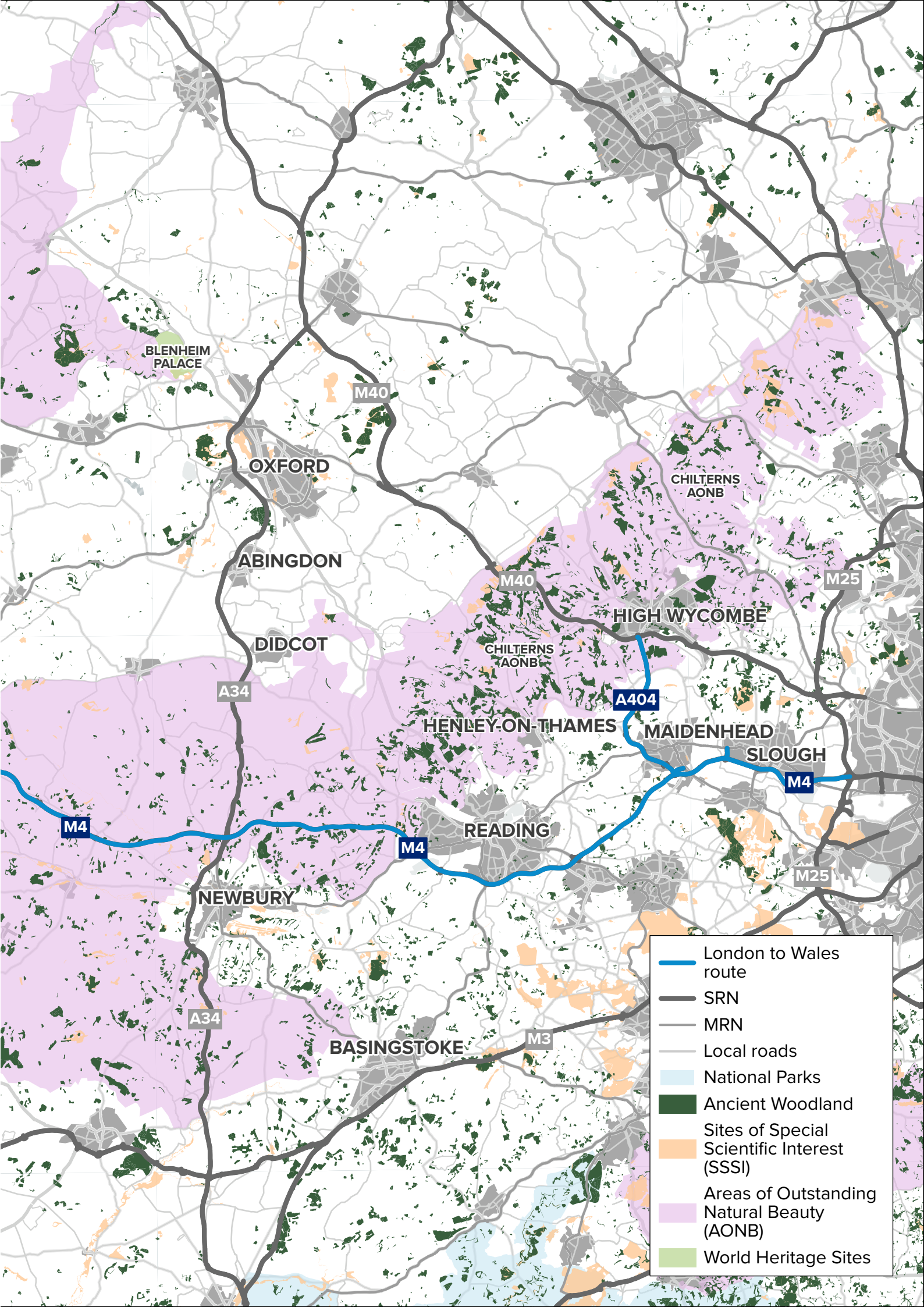


Figure 9: Environmental constraints

Esri UK, Esri, HERE, Garmin, FAO, METI/NASA, USGS. Contains public sector information licensed under the Open Government Licence v3.0


BLENHEIM PALACE
M40
OXFORD
CHILTERNS AONB
ABINGDON
M40
M25
HIGH WYCOMBE
DIDCOT
CHILTERNS AONB
A34
A404
HENLEY-ON-THAMES
MAIDENHEAD
SLOUGH
M4
M4
READING
M4
M25
NEWBURY
A34
BASINGSTOKE
M3
London to Wales route
SRN
MRN
Local roads
National Parks
Ancient Woodland
Sites of Special Scientific Interest (SSSI)
Areas of Outstanding Natural Beauty (AONB)
World Heritage Sites

Our network connects the country

02 The route

The London to Wales route plays a crucial role in supporting economic growth and runs approximately 170 miles from the outskirts of London through to Wales. It comprises: the M4 corridor which serves key locations including Bristol, Swindon and Reading; the M48 and M49 which provide short connecting routes to Wales, the M32 towards Bristol and the A417/419 connecting Swindon to the M5. It also includes the Huntercombe Spur between the M4 Junction 7 to the A4, the A404/A404(M) connecting the M4 to the M40 at High Wycombe and the A308(M) spur to Maidenhead.

The route interfaces with many other National Highways routes including Birmingham to Exeter (a key connection for north-south journeys, freight and tourist traffic), South West Peninsula, Midlands to Solent, London to Scotland (West), and the M25 London Orbital. The route passes through or lies close to important environmental areas such as the North Wessex Downs Area of Outstanding Natural Beauty (AONB), the southern tip of the Cotswolds AONB and the Chilterns AONB.

As shown in Figure 10 this route consists of the following motorways and A-roads: M4, M4 Junction 7 and Huntercombe Spur to A4, M32, M48, M49, A308 (M), A417, A419, A404 and A404(M).

The M4 forms the principal road connection between London and Wales. The M4 is heavily used by local and strategic traffic. There are increases in summer seasonal traffic flow on the M4 at the eastern and western ends close to junctions with the M25 and M5. The M4 is dynamic hard shoulder smart motorway between Junctions 19 to 20 north of Bristol and all lane running smart motorway from Junctions 8/9 to 12. Works to convert the M4 to smart motorway at Junctions 3 to 8/9 have been completed in 2022.

This route links London with Reading, Swindon, Bristol, and Gloucester and Cheltenham via the M4 and the A417/A419.

It is a major element of the transport links underpinning UK strategic connectivity, in particular for southern and western England, with South Wales. The route has seen the abolition of tolls on the Severn Bridges towards the end of 2018, and this has resulted in an increase in journeys between England and Wales.

Other routes connecting with the M4 provide access to key cities and towns. The M49 and M48, via the M4, connect Wales and England. The two Severn Bridges are managed by National Highways.

The M32 connects the M4 to Bristol. The A417/ A419 is an important connection between the M4 and Swindon to Gloucester, Cheltenham and the Midlands. The A404/ A404(M) and A308(M) connects the M4 to Maidenhead and High Wycombe.

The route is comprised of high standard motorway and dual carriageway with a short section of single carriageway on the A419 between Brockworth bypass and Cowley roundabout in Gloucestershire. A major improvement scheme to turn this section into dual carriageway, known as the A417 Missing Link, was granted an approved Development Consent Order in November 2022. The objectives of the A417 Missing Link scheme include reducing delays and improving safety at this location.

The M4 is important for growth, supporting communities and various strong economic sectors along the route, including the creative sector, high-tech, cyber security, information and communication, life sciences, advanced manufacturing, land-based services, and distribution and manufacturing. Key employers in the area include Verizon, Amazon, Microsoft, Cisco and Huawei. Further economic development is planned at key urban settlements of Bristol, Swindon and Reading which will place further demand on the route.

This route strategy is based on the road network as of the start of the second road period (2020 – 2025). During RIS1 and RIS2 the following schemes were delivered on the London to Wales route:

- a new bus-only slip road, north of Junction 2 on the M32
- M4 Junction 15 improvements and Junction 16 upgrade were completed in partnership between National Highways, Swindon Borough Council, Swindon and Wiltshire LEP and developers
- the M49 Junction 1 was built and is planned to be opened to traffic in RIS2

We recognise that some of the journeys on this route are part of longer trips and therefore need to be considered alongside strategies on other routes.

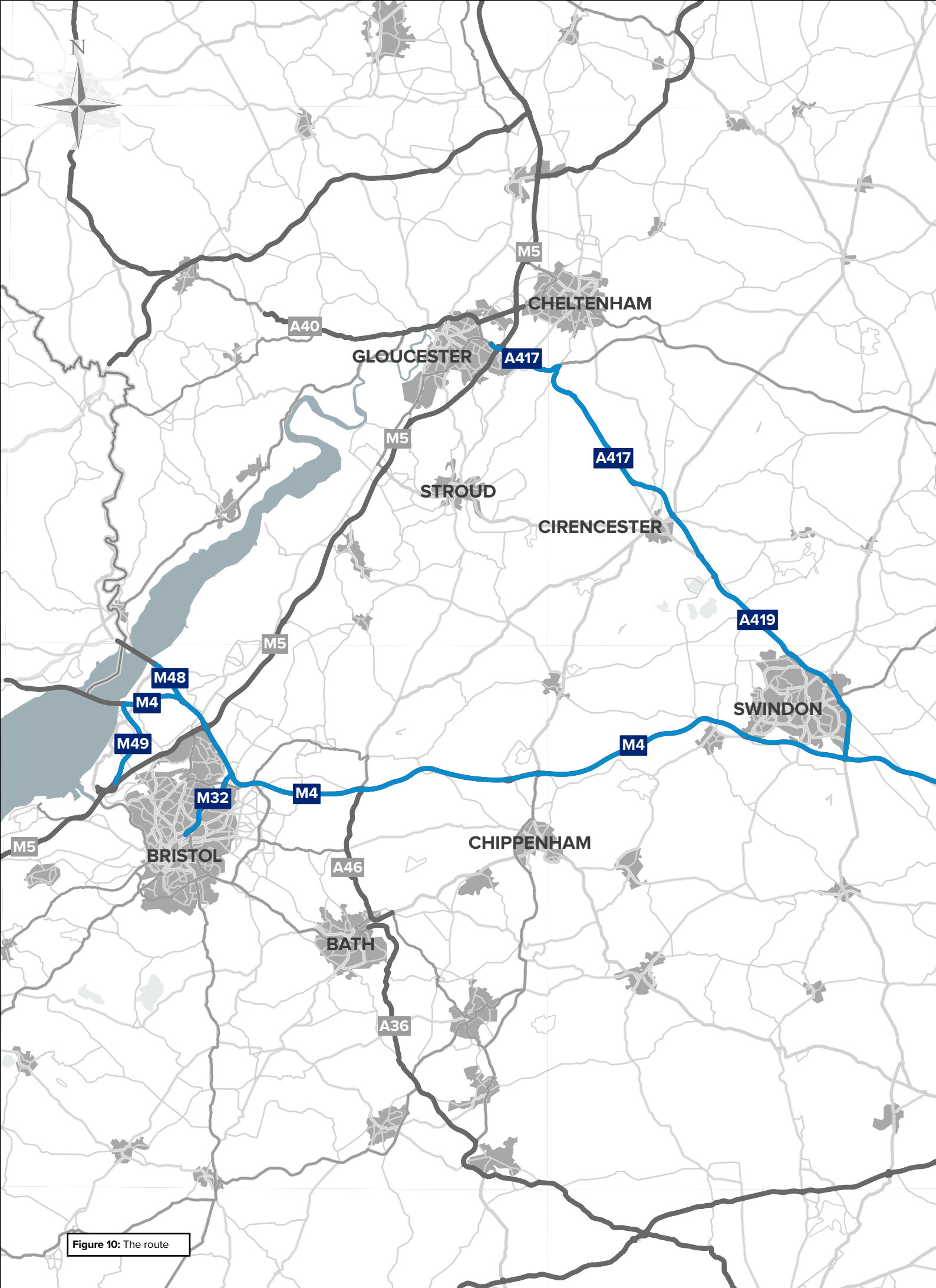


Figure 10: The route

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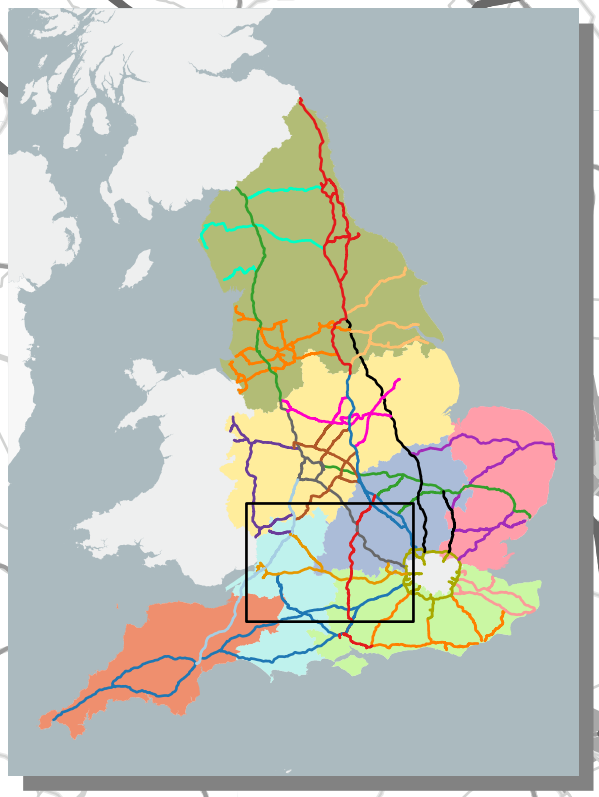


M40
OXFORD
M40
HIGH WYCOMBE
M25
A34
A404
SLOUGH
M4
M4
M4
READING
BRACKNELL
M25
NEWBURY
WOKING
A34
M3
FARNBOROUGH
BASINGSTOKE

London to Wales route
SRN
MRN
Local roads

Listening to your feedback

03 Engagement with customers and neighbours

Engagement with customers and neighbours has been central to developing our route strategies. The development of the route strategies is one of the key steps of initial research in the development of the Road investment strategy (RIS). This engagement, together with data analysis, will inform RIS3 (2025 to 2030) and beyond. It builds on a wealth of evidence from previous route strategies and our ongoing monitoring of road condition and performance.

Engagement with customers and neighbours along the London to Wales route

Early engagement with the Department for Transport (DfT), Office of Rail and Road, Transport Focus, Western Gateway, Transport for South East and England's Economic Heartland (Sub-national Transport Bodies) and Network Rail shaped our engagement with customers and neighbours in the London to Wales route area. We gathered evidence from a cross- section of Members of Parliament (MPs), interested parties, road users and communities at a route level to understand their needs for the future. This built on engagement that had taken place with national interested parties, such as environmental groups, organisations representing road users, business organisations and transport campaigning groups. This engagement has informed the development of the route objectives.

Engagement took place through:

MP roundtables: MPs were invited to a regional roundtable with the Roads Minister to share their views on priorities for our customers and neighbours within their constituencies.

Regional workshops: As part of a programme of workshops with interested parties at a national and regional level, we invited interested parties to workshops on route strategies for the London to Wales route in late 2021. Attendees included local authorities, airports and port authorities, transport operators, and other key route-based interested parties, such as major businesses.

We designed the workshops to seek views on both current and future challenges and opportunities for the SRN, in relation to the DfT's six strategic objectives. Views were sought on how the routes interacted with the major road network (MRN), local roads, public transport, walking and cycling, and links to the wider Strategic Road Network (SRN). Interested parties also provided insight into key growth proposals and locations along the route, including committed and emerging economic and housing growth and infrastructure proposals. Interested parties shared their own data, studies and observations of the route area.

Route strategies online feedback form: Local interested parties, road users and communities were invited to give their feedback on specific locations on motorways and A-roads and routes, and general comments on the road network, through the route strategies online feedback form. For the London to Wales route, regional interested parties were invited to workshops or to use the online form to share their views and feedback.

The information gathered was a mix of evidence, studies and personal experience. All the evidence gathered through these engagement methods was considered alongside route analysis and data to inform the development of the route objectives. The evidence was supplemented by route-based information from Transport Focus' *Strategic Road User Survey*[15] to gain an understanding of the breadth of feedback.

Key themes from engagement

We have drawn out the common themes that emerged from our engagement with our customers and neighbours on the London to Wales route to inform our route objectives. The themes have been aligned with the DfT's six strategic objectives:

i) Improving safety for all

- The M32 has safety and severance issues
- There are safety concerns on the A436 adjoining the A417 Air Balloon roundabout
- There are few driver welfare facilities on the A417, leading to potential safety issues such as driver tiredness
- For vulnerable road users there is a major severance issue on the A419
- The M4 in Berkshire authorities is used for short journeys because of severance. There is also a history of collisions and other incidents on the local road network to Reading, which raise safety concerns
- The Calcot to Theale footbridge across the M4 is insufficient for shared use between walkers and cyclists

ii) Network performance

- There is knock-on congestion on the local network, caused by congestion and mainline queueing on the M5, including at Junction 11a (with the A417) where there are capacity issues
- There is mainline queueing at A417 and A419 junctions, and on the A419 to the M4 at Junction 15
- The M4 between Junctions 4B and Junction 13 (A34) is subject to much congestion (especially at peak times) where the motorway serves several built-up areas
- Potential M4 bridge between Junctions 10 and 11 west of Reading to relieve pressure
- Network performance around the High Wycombe area, Handy Cross roundabout and Bisham Roundabout (particularly at peak times) and congestion on the A404 all raised concerns. Incidents on the M25 mean the A404 has a role in relieving pressure on the network but the Bisham roundabout hinders this
- Congestion on the A417 and A436 (adjoining Air Balloon roundabout)
- M4 congestion is generally at peak times (especially in the morning) at Junctions 11 and 12
- Journeys in proximity to and from the M25 experience peak time congestion, and likewise at the M4 junction with the M25
- Poor alternatives to the M4 compromise resilience of the route
- Resilience around the Bristol box is compromised by incidents. The M32 to the MRN experiences heavy inbound traffic causing congestion; Bristol is also a bottleneck for the M5 South West holiday traffic. The nearby M4 at Junction 20 also experiences congestion and resilience issues
- There is an increased importance of links to Heathrow as a global hub
- The A404 plays a role in resilience for the M40 to M4 part of the route
- Junction hopping has been identified as an issue around Reading and Wokingham
- The A34 has opportunities for demand management which could be investigated; the road currently has limited resilience
- Journeys on the A34 via the M4 and, from Southampton Port means a possible increase in freight traffic north-south and also on the M4

15 Transport Focus, 2022, *Strategic roads user survey*, https://www.transportfocus.org.uk/insight/strategic-roads-user-survey/

- The need for better M4 and M3 connectivity via the MRN to relieve pressure on the M25 South West quadrant
- Closures of the M4 and their impacts on adjoining routes
- Limited highway and public transport connectivity to Bristol Airport
- The Port of Bristol and its limited connectivity (Royal Portbury and Avonmouth) from the M5
- Greatest rail patronage seen on Great Western Rail compared to other Train Operator Companies
- The current absence of a mass transit system in Bristol encourages motor vehicle use which impacts the network

iii) Improved environmental outcomes

- Strategic traffic on the SRN in Gloucestershire is a source of carbon emissions
- Noise pollution issues on the route at A417 and near M5 Junction 11a
- AQMAs are designated on parts of the A417
- Reading has promoted greater facilities for electric vehicle charging and shift in modes of transport to enable air quality and healthy travel benefits. Further promotion is needed for active travel and public transport promotion, including directional signage to park and ride sites
- M32 is a source of air quality and noise issues
- Routes for active travel at M4 Junction 12; the area suffers from limited connectivity across the SRN for active travel users.
- There are ambitions for increased public transport use on the M32, both in terms of integration and provision, including park and ride facilities
- Air quality issues in proximity to the SRN at High Wycombe
- Mobility as a Service and the potential space release on the SRN
- The removal of tolls on the Severn Bridge increased number of private vehicle using the crossing, which may impact shift to other modes of transport

iv) Growing the economy

- Housing and employment growth at Ashchurch, Golden Valley Development Cheltenham and the expansion of Thames Valley Science Park
- Development proposed in north and south Bristol and urban intensification, such as the Bristol Temple Quarter Masterplan.
- Storage and distribution facility proposed at the old Honda site in South Marston, Swindon.
- Wokingham development and associated journeys on the M4, or crossing the M4 to Reading
- Growth in Bath may have an impact on the M4 Junction 18 and the A46
- Growth in and around Swindon – M4 Junction 15 may be impacted
- Growth at Avonmouth is proposed, including expansion of the docks
- The A417 Missing Link scheme is economy-led, and east-west journey demand may go up

v) Managing and planning the SRN for the future

- Changes to the travel peak and broader commuter trends into urban areas
- Rail proposals along the route such as the new Green Park Station in the south of Reading and the potential Heathrow Western Rail Link from the Great Western Main Line.
- Importance of the role of the A417/A419 as a freight route for journeys from the Midlands to the South East and London
- Theale station upgrade to park and ride status at the M4 Junction 12

- Potential Western Rail Link to Heathrow to relieve pressure from the M4 and increase public transport connectivity to the airport.
- There is an opportunity for service uplifts in both rail and MetroWest at and around Bristol
- A potential new rail station at Charfield, and the Portishead line reopening
- A significant renewal of the M32 Eastville viaduct is planned however this will have a significant impact on capacity whilst works are being carried out

vi) Views on: Technology-enabled network

- Consideration for connected and autonomous vehicles and connected in terms of capacity and risks
- Opportunities for electric vehicle charging

Engagement quotes from customers and neighbours:

"Opportunity to decrease speed to 50 mph to reduce noise and pollution for the surrounding area" (in reference to the A329(M).

(Route strategies engagement)

"M4 J16 roundabout almost constant peak time delays to Royal Wootton Bassett from Swindon due to poor traffic light coordination" (in reference to the M4).

(Route strategies engagement)

"Eastbound carriageway has three lanes but westbound only two. westbound carriageway requires 3 lanes" (in reference to M4 west of Almondsbury Junction).

(Route strategies engagement)

"Part of the Knowle Hill horse riding circuit crosses the A4 at both Littlewick Green junction of Green Lane and Jubilee Road, and at Knowle Hill Star Lane... The latter crossing is used heavily also by cyclists and walkers..." (in reference to the A404 northbound access from A4130).

(Route strategies engagement)

"No traffic on this trip - often there is. Looking forward to new A417 Missing Link construction next year" (A417)

(Transport Focus, SRUS)

"The A419 causes significant noise ....and poor-quality journey for road users." (in relation to the A419).

(Route strategies engagement)

"Average speed limits kept the traffic on the move." (M4)

(Transport Focus, SRUS)

"Difficulties getting on to M4 at Junction 15, but a good journey once on the motorway." (M4)

(Transport Focus, SRUS)

"There is a need to improve traffic flow north and southbound along the M5 at and around Almondsbury interchange J15 (Junction 20 M4) caused by reduction of M5 to two lanes" (in reference to the M4).

(Route strategies engagement)

"The M32 in Bristol ... has bisected the community, making it difficult for local residents to get around their own area... It is not possible to drive anywhere during rush hour if you live anywhere nearby. There are high levels of pollution communities along the length of the motorway." (in reference to the M32).

(Route strategies engagement)

Figure 11: Quotes from customers and neighbours

Route satisfaction

Satisfaction scores have been obtained from Transport Focus through their Strategic Roads User Satisfaction Survey from the last 12 months to May 2022. It covers the roads in this route but it should be noted that the satisfaction scores may not fully align with the extent of the roads in the route. Figure 12 below shows how satisfied drivers were with aspects of their journey and how they felt during their journey.

Additional comments and data from the Transport Focus survey of drivers on the SRN can be found on the Transport Focus website data hub[16].

The engagement themes and feedback from MPs, interested parties, road users and communities has been considered as part of the wider analysis in Chapter 5.

Strategic roads user survey satisfaction scores

The survey was not run between April 2020 and March 2021 due to Covid-19. It restarted in April 2021 with a new methodology, so results prior to March 2020 and from April 2021 are not directly comparable.

National Highways Region: South East, South West,
Individual road: M4, N32, M48, M49, A404(M), A404. A417,

Last 12 months*** May 2022 (last 12 months)

* Before March 2019 and from April 2021 to February 2022 this is year-to-date, not past 12 months

Figure 12: Satisfaction scores from headline results

16 Transport Focus, 2022, *Transport Focus Website,* https://transportfocusdatahub.org.uk/

Working with our partners

04 Network collaboration

The Strategic Road Network (SRN) does not exist in isolation. Most journeys on the SRN are part of a longer journey, involving other road networks or different transport modes.

To deliver safe and efficient journeys for our customers and to support economic and housing growth, at National Highways we have built relationships with other organisations to ensure the SRN maximises its contribution to the overall transport system, which includes local roads, rail networks, links with the devolved nations and international connectivity. We work with other network operators (such as Network Rail), airports and ports, Sub-national Transport Bodies, Transport for Wales and Transport Scotland, as well as combined authorities and local highway authorities. This is in line with National Highways' Licence requirements to consider opportunities for collaborative solutions. We recognise that joint early planning of interventions outside our network will ultimately improve the SRN and deliver greater benefit to the customer than could be achieved alone, where this delivers value for money.

An integrated transport network

Route strategies recognise the role that the SRN plays within the wider transport network. In planning for the future of the SRN, we recognise the importance of working closely with other network planners and operators to ensure our transport networks work well together, and that our investment priorities are aligned where possible.

Sub-national Transport Bodies have a key role in their regions in creating transport strategy and identifying key areas for investment, including for highways. There are seven such bodies in England, who are tasked with developing transport strategies and studies for their particular area. Through the collection of evidence with their local authorities and Local Enterprise Partnerships, their work highlights multimodal issues, needs and opportunities. A list of potential interventions for transport are then provided to the Secretary of State for Transport, including where to prioritise investment in the major road network.
We work closely with the Sub-national Transport Bodies on interdependencies and align our approaches where possible. The Sub-national Transport Bodies that cover the route are:

- Western Gateway
- England's Economic Heartland
- Transport for South East

National Highways and Sub-national Transport Bodies have worked together to develop an engagement framework. The need for closer working was highlighted as a priority in DfT's Road Investment Strategy 2[17], and within our Strategic business plan[18] and Delivery plan[19]. It enables National Highways and Sub-national Transport Bodies to work together to achieve mutually beneficial outcomes for transport users, regional economies and the environment. Our approach to engagement is contained in our Vision for route strategies[20], which sets out a shared commitment for a continued open, constructive and collaborative relationship. This is supported by engagement and action plans for each Sub-national Transport Body, which are proving instrumental in ensuring consistency and transparency in the information we share. The plans are monitored and reviewed regularly, with annual reviews occurring ahead of each new financial year.

At a more local level we also work with local authorities, who are the highway authorities for local roads, including those on the MRN.

17 Department for Transport, *Road Investment Strategy 2: 2020 - 2025,* https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/951100/road-investment-strategy-2-2020-2025.pdf
18 Highways England, *Strategic business plan: 2020 - 2025,* https://nationalhighways.co.uk/strategic-business-plan/
19 Highways England, *Delivery plan: 2020 - 2025,* https://nationalhighways.co.uk/delivery-plan/
20 Highways England, 2021, *Vision for route strategies Planning for the future of our roads*, https://nationalhighways.co.uk/media/w0vhd3un/vision-for-route-strategies.pdf

This collaboration ranges from operational matters to more strategic issues to ensure that the overall highway network operates safely, efficiently and effectively, providing high quality and seamless customer journeys. The local authority planning teams work closely with our spatial planning teams. In enabling new employment spaces and homes to be developed, we engage fully as a statutory consultee in the planning system and the evidence collected through the route strategies will support this decision making.

Western Gateway

The Western Gateway Sub-national Transport Body covers the area from Gloucestershire in the north of the South West region, to Dorset and Bournemouth, Christchurch and Poole in the south via the Bristol city region and Wiltshire.

Western Gateway's objective is to maximise the capacity and resilience of the strategic transport corridors, and targets delivery of 300,000 new homes and 190,000 new jobs over the next 20 years. To achieve the Western Gateway's full potential, there is a need to improve connectivity for businesses, employees and the leisure and tourism sector which relies heavily on the SRN.

WG STB are developing a long-term Strategic Transport Plan for the area with the following key objectives:

- ensure effective access to labour markets
- greater integration of employment clusters
- enhance business connectivity to international markets
- improve North-South connectivity
- decarbonisation of the strategic transport network
- adoption of electrification and alternative fuels

Western Gateway in their Economic Connectivity Study21 have identified four corridors which connect strategically important locations across the area, including the main urban centres, ports and airports.

The London to Wales route best aligns with the South East to South Wales corridor, otherwise known as the Western Innovation corridor. This corridor is home to world leading public and private sector research, science and technology institutes and attracts a range of industry leading businesses. The corridor facilitates connectivity between the Western Gateway and other key locations for research, academia and innovation such as Oxford, Science Vale UK Enterprise Zone and Basingstoke. The strength of the corridor's economy creates significant travel demand.

On parts of the route are the Midlands to South West corridor and the Midlands to the south coast corridor; known respectively as the 'Western Growth Corridor', including Gloucester, Cheltenham and Bristol, and the 'Missing Link Corridor' including Gloucester and Swindon. The Western Growth Corridor is one of national economic significance, connecting the Midlands Engine, Western Gateway and the South West. This corridor supports access to national and international markets and helps drive growth and economic performance for the country as a whole. The Missing Link Corridor is a strategic link within the Western Gateway area and connects the M4 to the south coast and the Midlands. With better access to coastal international gateways and provision of strategic resilience during network demand at seasonal peaks, there is the potential to drive change in the Dorset and Wiltshire economies and boost the Western Gateway region.

21 Western Gateway, 2019, *Economic Connectivity Study,* https://westerngatewaystb.org.uk/strategy/economic-connectivity-study/

England's Economic Heartland

EEH published their Regional Transport Strategy titled *Connecting People, Transforming Journeys*[22] in 2020. The strategy outlines the framework for enabling green economic growth, in a way which also creates a net zero transport network. The strategy further details the importance of working with partners, local Growth Boards and national initiatives.

England's Economic Heartland priorities are:

- achieving net zero carbon emissions from transport no later than 2050, with an ambition to reach this by 2040
- improving quality of life and wellbeing through a safe and inclusive transport system accessible to all which emphasises sustainable and active travel
- supporting the regional economy by connecting people and businesses to markets and opportunities
- ensuring the Heartland works for the UK by enabling the efficient movement of people and goods through the region, and to and from international gateways, in a way which lessens its environmental impact

These strategic priorities set out how the region can reduce reliance on private car usage by creating better connectivity within communities. It also details how the Heartland will work to harness leading expertise in clean, green and smart technologies, allowing the region to have a competitive edge in global markets.

Whilst the transport strategy is ambitious, it aims to deliver the EEH vision of supporting sustainable growth and improving the quality of life through a decarbonised transport network. This will encourage innovation and create further opportunities for local residents and the local economy, whilst also benefitting the national and international economy.

Transport for the South East

Transport for the South East (TfSE) published their *Transport Strategy for the South East*[23] in 2020. The plan has been created with the support of the 16 local transport authorities within the TfSE area, along with the five Local Enterprise Partnerships, 46 District and Borough Councils and other key interested parties.

The strategy sets out TfSE's thirty-year vision for the region, with their strategic goals and priorities. Their 15 strategic priorities sit under three strategic goals; economy, society, or environmental.

The economic priorities are:

- better connectivity between our major economic hubs, international gateways (ports, airports and rail terminals) and their markets
- more reliable journeys for people and goods travelling between the South East's major economic hubs and to and from international gateways
- a transport network that is more resilient to incidents, extreme weather and the impacts of a changing climate
- a more integrated approach to land use and transport planning that helps our partners across the South East meet future housing, employment and regeneration needs sustainably
- a 'smart' transport network that uses digital technology to manage transport demand, encourage shared transport and make more efficient use of our roads and railways

22 England's Economic Heartland, 2020, *Connecting people, transforming journeys,* https://eeh-prod-media.s3.amazonaws.com/documents/Connecting_People_Transforming_Journeys_av.pdf

23 Transport for the South East, 2020, *Transport Strategy for the South East,* https://transportforthesoutheast.org.uk/app/uploads/2020/09/TfSE-transport-strategy.pdf

The social priorities are:

- a network that promotes active travel and active lifestyles to improve our health and wellbeing
- improved air quality supported by initiatives to reduce congestion and encourage further shifts to public transport
- an affordable, accessible transport network for all that promotes social inclusion and reduces barriers to employment, learning, social, leisure, physical and cultural activity
- a seamless, integrated transport network with passengers at its heart, making it simpler and easier to plan and pay for journeys and to use and interchange between different forms of transport
- a safely planned, delivered and operated transport network with no fatalities or serious injuries among transport users, workforce or the wider public

The environmental priorities are:

- a reduction in carbon emissions to net zero by 2050 at the latest, to minimise the contribution of transport and travel to climate change
- a reduction in the need to travel, particularly by private car, to reduce the impact of transport on people and the environment
- a transport network that protects and enhances our natural, built and historic environments
- use of the principle of 'biodiversity net gain' in all transport initiatives, where development leaves biodiversity in a better state than before
- minimisation of transport's consumption of resources and energy

The strategic priorities set out in the TfSE Transport Strategy provide a clear framework which informs future decision-making. It will help to create a 'more productive, healthier, happier and more sustainable South East'.

Interaction with the major road network and local roads

The major road network (MRN) is the middle tier of England's road network, comprising the busiest and most economically important local authority A-roads. It is key to supporting the economic vitality of England, particularly with its role, along with the SRN, of delivering 'first and last mile' connections and onward journeys. It acts as a connecting spine for the SRN, with one of the objectives in establishing the MRN being to support the SRN through improving journeys across both networks. The MRN represents the roads that our partners in local authorities and Sub-national Transport Bodies see as being strategically most important, along with the SRN.

The relationship between the SRN and MRN is complex. The two networks connect people with economically important locations across England, as well as providing resilience for each other. Interventions on one network can also significantly influence travel behaviours on the other. Most SRN journeys involve elements of both networks.

It is therefore important that decisions about the SRN, MRN and other local roads are made in a joined-up way to ensure that the networks are consistent, coherent and complementary. We recognise that the key to the success of the Road investment strategy (RIS) is ensuring the impacts of any interventions are fully considered across all networks as well as at their junctions. Both networks play a key role in customers' journeys, and they expect a seamless transition between the two. We are continually seeking to identify collaborative solutions that meet our obligations under the National Highways Licence to improve network performance and provide integration benefits. In developing the route strategies, we aim to ensure the planning for the SRN, MRN and other local roads is complementary.

Within the vicinity of the London to Wales route, the MRN comprises the A4 for east-west connectivity between Slough, Reading and Newbury, and the A329(M) for access to Reading and onward connectivity to Surrey. The A355 at M4 Junction 6 provides connections to Slough to the north and Windsor to the south. Further to the west the A33 at Junction 11 connects the M4 to Reading and south to the A339.

Near Swindon, the A420 at the White Hart Junction serves as an important cross-country link between Swindon and Oxford. The A350 at Junction 17 of the M4 provides connection to Chippenham. Further west, the A46 at Junction 18 links the M4 north towards Chipping Sodbury.

To the north the A436 (adjoining the Air Balloon Roundabout) connects to the A40, which provides east-west connectivity from Gloucester and Cheltenham to Oxfordshire.

Bristol and its surrounding area, including Bath, is supported by the MRN through the A4 linking the M49 and the two cities and also through the A4174 which serves as a ring road on the northern and eastern edges of Bristol. The A4320 joining the end of the M32 has onward connections to the A4 to the south. The A38 provides access to Bristol Airport.

Freight and logistics

The *Future of Freight: a long-term plan* (DfT June 2022)[24] sets out priorities for the UK's freight industry. It recognises that in 2019 the sector contributed 10% of the UK non-financial business economy and £127billion GVA through more than 200,000 enterprises, noting that, with imports and exports comprising 63% of GDP in 2019, we are reliant on the freight and logistics sector for our economic wellbeing.

In the UK, around 1.65 billion tonnes of freight are lifted by all modes each year. Supporting National Traffic Information Service (NTIS) HGV flow percentage data shows that between 11 to 15% of daily traffic levels is made up of heavy goods vehicles (HGVs) on the majority of the route.

The western part of the route, where it crosses into Wales, has the highest proportion of HGV journeys, at 16% to 18%. On the mainline of the M4 at Junction 16 westbound and on the M4 mainline around Membury, HGVs make up 16% of daily traffic levels.

The route provides access to a key freight asset at the Port of Bristol. The Port handles 8 million tonnes of freight per year, with consent for a Deep Sea Container Terminal.

Freight demands are likely to increase in the future, with increasing logistics development around Avonmouth/ Severnside and Swindon. Increased lorry journeys to and from these ports and key industrial locations will also increase demand for lorry parking and driver welfare facilities.

The logistics sector is a critically important enabler of the success of other businesses of all sizes and sectors, and the SRN and rail transport infrastructure plays a vital role in keeping products moving efficiently.

A successful and thriving freight and distribution industry relies on good quality freight facilities. The *National Survey of Lorry Parking*[25] undertaken by DfT in 2017 showed the level of utilisation of lorry parking facilities at on-site lorry parks and motorway service areas in the South West region as being at a 'serious' level (72%) whereby drivers have to search for spaces.

24 Department for Transport, 2022, *Future of Freight: a long term plan, Department for Transport*, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1085917/future-of-freight-plan.pdf
25 Department for Transport, 2017, *National Survey of Lorry Parking* https://www.gov.uk/government/publications/national-survey-of-lorry-parking

Projecting past trends for increased demand for lorry parking, the report identified that utilisation levels in the South West and South East would be 'critical' (85% or over) by 2024. Specifically, the following M4 lorry parks were identified to have critical levels of utilisation in 2017: Moto Reading Westbound (120%), Moto Chieveley (102%), Moto Reading Eastbound (94%) and Moto Leigh Delamere Westbound (85%).

In the South West region, around the western end of the route, the 2017 survey found that 33% of vehicles were parked off-site – either in laybys or industrial and retail estates. The report identified regionally high off-site parking around and on approach to the Port of Bristol. Supply issues can give rise to issues of inappropriate HGV parking, whilst the provision of suitable wash and food facilities is important for improving driver health, safety and wellbeing.

The report concluded that there was a practical need for a 25% increase in lorry parking spaces in the South West region. This level of provision would allow every lorry to be able to park in a space overnight.

Concerns have been expressed regarding the lack of abnormal load bays on the network and their booking, consequently rendering sections of the network unavailable to allow for mandatory driver rest periods. Abnormal load parking is further compromised by service areas applying to install more drive through coffee shops, which often affect those areas reserved for abnormal load parking. Security of parking areas has been questioned owing to increased instances of diesel theft as well as theft of products transported by the parked vehicles; in particular, soft sided vehicles, for example tautliners.

In the South East region, at the eastern end of the route, the 2017 survey found that 24% of vehicles were parked off-site – either in laybys or industrial and retail estates.

The report concluded that there was a practical need for a 37% increase in lorry parking spaces in the South East region. This level of provision would allow every lorry to be able to park in a space overnight, considering that a lorry park is, in practice, full at 85% capacity.

As part of continued government action to boost driver welfare and tackle the effect of a current driver shortage impacting the UK, National Highways is investing in improved roadside facilities. Roadside service operators are currently being encouraged to apply for funding under the Users and Communities Fund to improve the standard of lorry parking and driver welfare facilities.

Further to this, plans are being made for more at Bristol's container port by expanding freight services as a means of building resilience, according to the DfT's plan for the *Future of Freight (2022)*.[26]

The London to Wales route boasts a wealth of freight assets that grants England a strong multimodal freight capability cross country. These include:

Two international airports, including Bristol and Heathrow are located in proximity to the route. The latter serves as a major international cargo and passenger hub, accounting for more than 70% of all UK air freight per tonne attributed to its vast long-haul passenger network[27]. Interested parties mentioned the importance of Heathrow as a global hub.

The Port of Bristol serves as a key node for trade and employment. It is estimated the port employs in the region of 600 direct jobs with a further 10,000 jobs dependent on port related business.[28] The port handles an estimated half a million motor vehicles per year and a quarter of all UK aviation fuel and animal feed imports.

Much of the route currently has low provision for lorry and coach parking.

26 Department for Transport, 2022, *Future of Freight: a long term plan, Department for Transport*, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1085917/future-of-freight-plan.pdf
27 Heathrow Airport, 2016. *Our cargo strategy.* https://www.heathrow.com/content/dam/heathrow/web/common/documents/company/cargo/cargo-strategy.pdf
28 The Bristol Port Company, 2022, *Bristol Port Company website*, https://www.bristolport.co.uk/about-us/bristol-port-company-today

Diversionary routes

To operate a resilient road network, we need to be able to effectively divert traffic off the SRN in the event of unplanned incidents (such as collisions or emergency roadworks), or as part of planned closures (such as planned improvement schemes). The MRN, along with the rest of the local road network, supports the SRN as diversion routes during these events.

We have agreed diversion routes for emergency events with local authorities. Diversion routes for planned events are discussed and agreed with local authorities on a case-by-case basis. These routes are dependent upon the nature of the incident, and the suitability and availability of the surrounding network. In some cases, the diversion route may not be suitable for certain types of traffic, such as heavy goods vehicles (HGVs), or non-motorway traffic, such as cycles and tractors. In other cases, diversionary routes may not be available due to events on the local road network. We work closely with local authorities to ensure that suitable diversion routes are available.

Network Rail and other network operators

The SRN plays an important role in the movement of passengers and freight across England, and it needs to be considered alongside the wider transport network. The rail network is also important in moving freight and people over longer distances and helping commuters travel into congested cities. Better integration between road and rail can help to transfer more journeys onto rail. This can help to relieve congestion on the SRN, as well as improve the environment by increasing the use of more sustainable transport modes.

At a strategic level, we work closely with Network Rail and train operators to find opportunities to better integrate the two networks to benefit the movement of freight and people. This involves seeking opportunities to place rail stations in strategically important locations with easy access to the SRN.

Network Rail's Delivery Plan for 2019-2024[29] presents a vision of "putting passengers and freight users first". This strategy recognises that Network Rail can improve the daily lives of people across the country by striving to constantly improve the quality of its service across the whole railway system. Network Rail delivers its vision through a regional structure committed to responding to the needs of local customers and interested parties, more quickly than if such decisions were to be made at a national level.

The London to Wales route closely parallels the Great Western Mainline between London and South Wales, which falls within Network Rail's Wales and Western region.

This is a heavily used, high-speed railway, and the length of route sees frequent inter-city services between principal hubs including Cardiff, Bristol, Cheltenham and Gloucester, Swindon, Reading and London. It offers direct rail connections to Heathrow Airport from London. It also carries strategically significant freight flows between London, the South East and South Wales, and the West of England. It has seen major recent investment including electrification between London and Cardiff, and reduced journey times. Further significant change is imminent with the introduction of Elizabeth Line trains to Reading.

29 Network Rail, *Our Delivery Plan for 2019 – 2024*. https://www.networkrail.co.uk/who-we-are/publications-and-resources/our-delivery-plan-for-2019-2024/

Rail industry strategy for the London to Wales route includes further service improvements in the Bristol area (MetroWest) and recommendations for improved services between South Wales, and London and the South East, and in particular between South Wales and the Bristol area, included in the *Union Connectivity Review*[30].

In addition are the Bristol, Swindon and Reading Area Signaling Schemes, and the Filton Bank Scheme. Future priorities are the MetroWest Phase 1 and Phase 2 for the West of England area; this could include stations at Henbury and North Filton in Bristol. The Great Western Mainline is a heavily used railway and recent investments have increased both capacity, with more passenger services, and capability, with faster, diesel-free journeys. Once the Elizabeth Line is fully operational and MetroWest services are delivered, the rail system will be operating near capacity.

On the London to Wales route, there are examples of important stations on the rail network at Bristol, Swindon, Reading (as well as onward connections to Maidenhead and Slough which connect via links other than the Great Western Main Line), which act as commuter points on the network, and therefore are important links to the SRN. Our route strategies understand the role of the SRN in providing access to and from these key facilities.

We also work with the operators and promoters of urban rapid transit systems where there are opportunities for better integration. For example, through the creation of park and ride sites to remove traffic from the road network.

Strategic connectivity

The SRN plays a key social and economic role in connecting England with the devolved authorities of the UK, particularly Wales and Scotland, but also, via ports, Northern Ireland. We work closely with Transport for Wales and Transport Scotland to ensure our key cross- border routes are joined up effectively with those in Wales and Scotland to ensure easy journeys for our customers. This strategic connectivity is reflected in the Government's commitment to strengthening transport connections across the UK, guided by Sir Peter Hendy's *Union Connectivity Review* published in late 2021. The report recommends the creation of UKNET, a strategic transport network spanning the entire United Kingdom.

UKNET would be based on a series of principal transport corridors between key urban and economic centres, including international gateways. The findings of this report have been considered in our route strategies, particularly for our cross-border routes and roads connecting to important ports.

The M4 and M48 enable journeys to Wales and provide a link to the M5. The *Union Connectivity Review*[31] notes that the route exhibits high cross-border journeys on the two Severn bridges in terms of commuting, leisure trips and freight, amassing to approximately 100,000 journeys daily in 2019 on the M4 and M48. These are important SRN connections and routes for both passengers and freight and the SRN is considered within this broader context. The removal of tolls from the Severn crossings in 2018 led to an immediate increase in traffic crossing the Prince of Wales bridge. We will continue to review the effects of this change.

30 Sir Peter Hendy CBE, 2021, *Union Connectivity Review final report*, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1036027/union-connectivity-review-final-report.pdf

31 Sir Peter Hendy CBE, 2021, *Union Connectivity Review: Final Report*, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1036027/union-connectivity-review-final-report.pdf

International connectivity

One of the objectives of the SRN is to support the important economic activity involved in international passenger and freight movement via good connections to ports and airports. A key aspect of route strategies is ensuring that future investment continues to support these essential journeys.

On the London to Wales route, this means that the M4 needs to be considered not only within the context of the local access they provide, but also the strategic connectivity as the principal SRN link to the international gateways of Heathrow, Bristol and Cardiff Airports and the Port of Bristol. Further afield, the M25, A34 and A38 provide onward connectivity to other main ports and airports of England.

Heathrow Airport is one of the busiest international airports in the world and an important local employer in the South East. In 2019, pre-Covid, the airport handled 80 million passengers which comprised almost a third of all UK airport passengers.[32] It is also a vital freight hub and is fundamental to the UK economy as the airport handles annual freight loads of approximately 1.5 million tonnes per year.[33]

The Port of Bristol is strategically important for trade which benefits from SRN access off the M5, forming an important international gateway, and supports approximately 10,000 jobs[28]. Key industries supported by imports and exports at the site include motor vehicles, for which the Port of Bristol is the principal UK port, agriculture and fuels.

Bristol Airport is located approximately five miles to the south-west of Bristol and is accessed by the A38. It is a regionally significant airport providing a range of international business and leisure destinations across Europe. In 2019 it was the eighth busiest UK airport handling almost nine million passengers[33], with planned increase to 12 million.

32 Civil Aviation Authority, 2019, *Annual airport data 2019*, https://www.caa.co.uk/data-and-analysis/uk-aviation-market/airports/uk-airport-data/uk-airport-data-2019/annual-2019/
33 Bristol Airport, *Our Future*. https://www.bristolairport.co.uk/corporate/about-us/our-future/

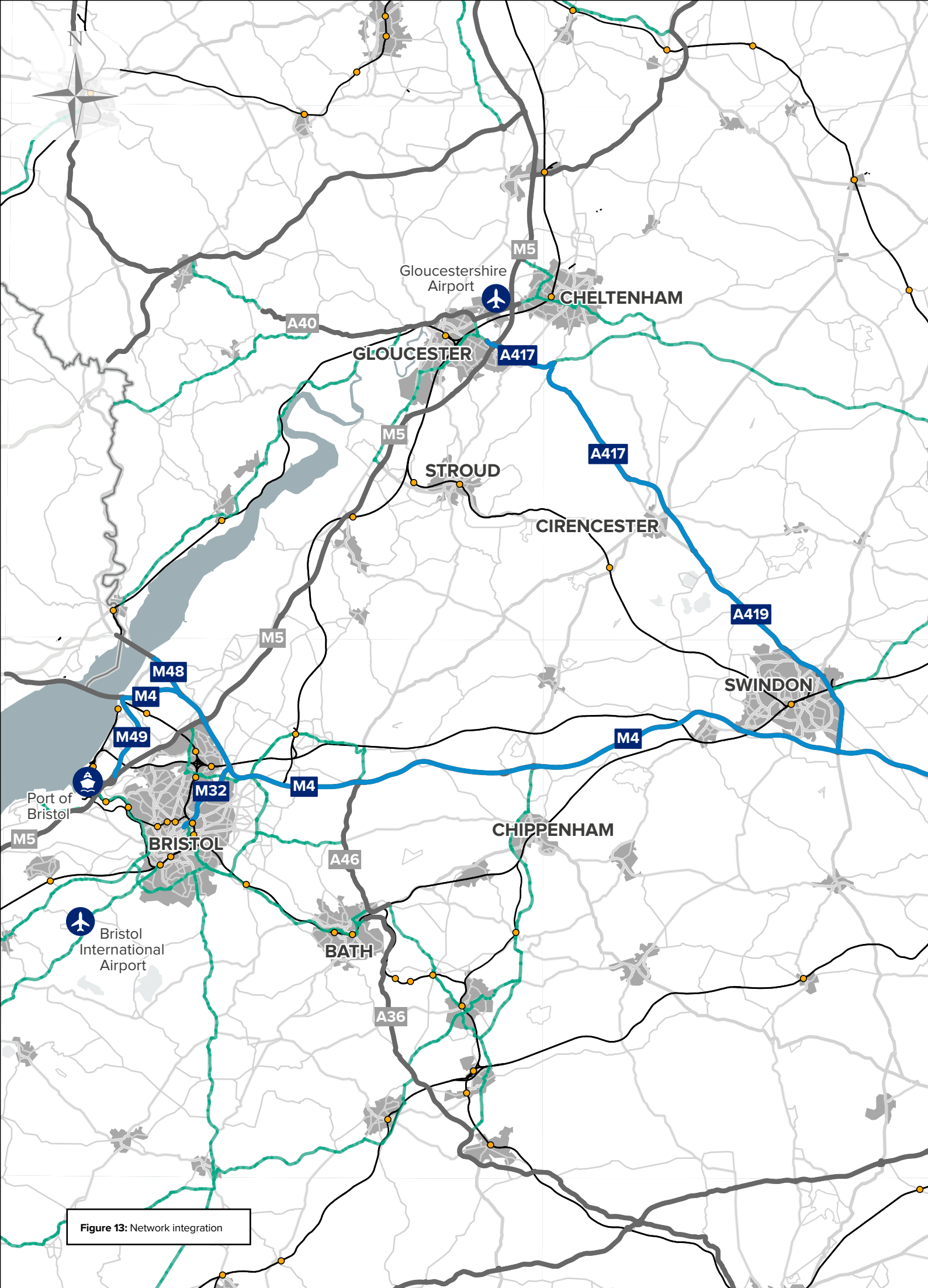
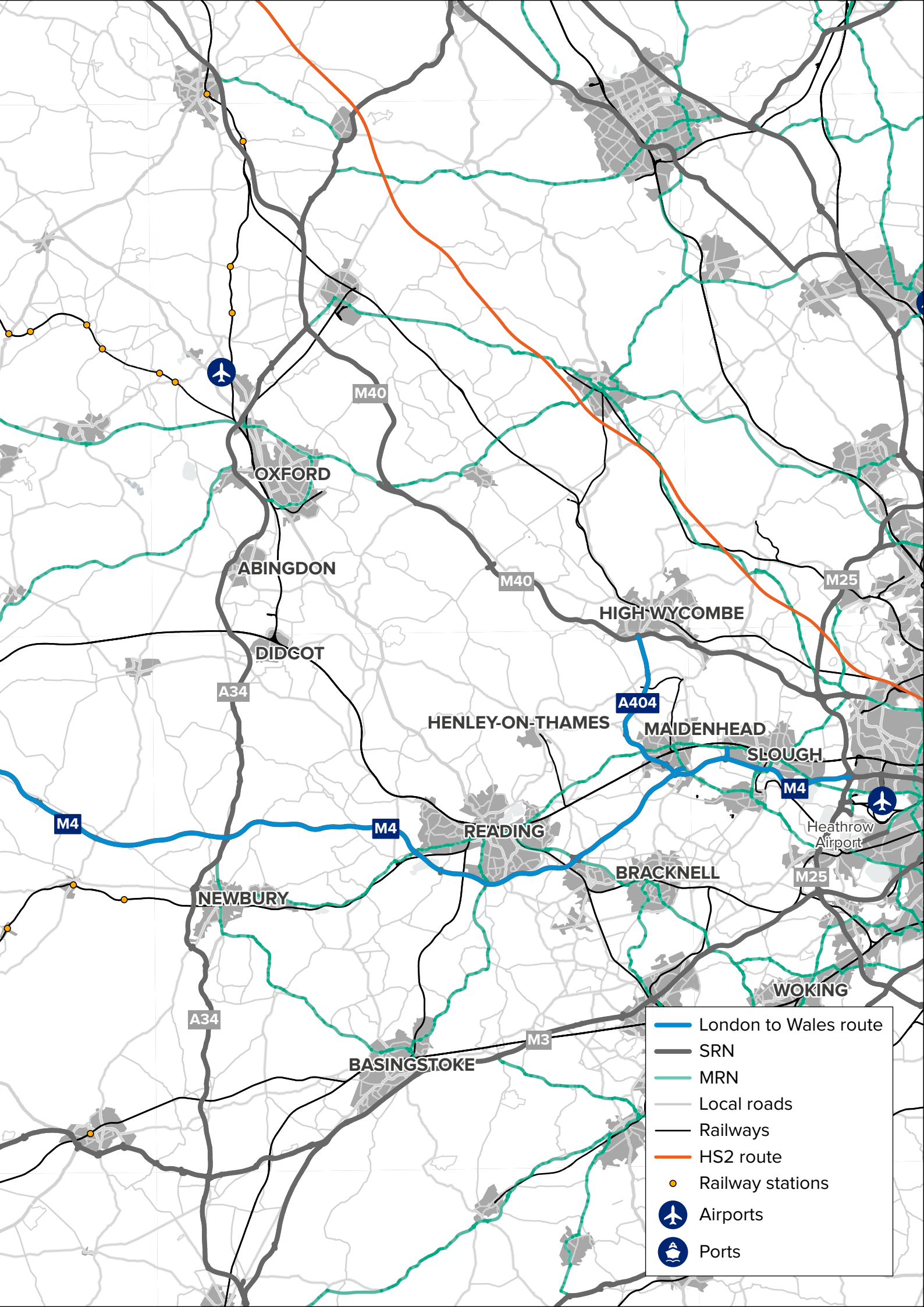


Figure 13: Network integration

Esri UK, Esri, HERE, Garmin, FAO, METI/NASA, USGS. Contains public sector information licensed under the Open Government Licence v3.0.


M40
OXFORD
ABINGDON
M40
M25
HIGH WYCOMBE
DIDCOT
A34
A404
HENLEY-ON-THAMES
MAIDENHEAD
SLOUGH
M4
M4
M4
READING
Heathrow Airport
BRACKNELL
M25
NEWBURY
WOKING
A34
M3
BASINGSTOKE
London to Wales route
SRN
MRN
Local roads
Railways
HS2 route
Railway stations
Airports
Ports

Challenges and issues on the route

05 Challenges and issues

We recognise that there are existing challenges and issues on the network and these are outlined against the DfT's six strategic objectives as part of the route strategy evidence base.

1. Improving safety for all

The International Road Assessment Programme (iRAP) Star Ratings are based on road inspection data and provide a simple and objective measure of the level of safety which is 'built-in' to the road. The higher the star rating, the safer the road. iRAP star ratings are produced for each 100-metre section of road, based on detailed inspections of roadside features as well as traffic flow, speed, pedestrian and cyclist use, and crash data.

iRAP data helps us to predict future risk within a wider Safe System approach. Safe System thinking accepts that humans will make mistakes but considers what is within the scope of our influence to limit the injuries sustained. The iRAP approach to managing future risk complements the more traditional approach of analysing historical incident data provided by STATS19 as a means of predicting future collisions and casualties.

STATS19 data are the statistical data published by the Office for National Statistics about personal-injury road traffic collisions reported to the police. STATS19 remains the most detailed, complete, and reliable single source of information on road casualties covering the whole of Great Britain, in particular for monitoring trends over time.

For the purposes of National Highways Route Strategies, the total fatal and serious injuries are aggregated by the section of road on which they occurred, based on the NTIS (National Traffic Information Service) network.

The NTIS network used for displaying traffic data is the full extent of the roads for which National Highways are the highway authority. The NTIS network is modelled for each side of the carriageway, such that NTIS links are one-directional and split at junctions. The data used only includes main carriageways; slip roads, roundabouts and other types of road are not modelled in this dataset. The length of an NTIS link can vary greatly depending on what part of the network it represents. Use of the NTIS network provides a common geometry which can be used to compare the STATS19 data with network performance and other metric data.

A combination of star ratings and historic data can help us to prioritise route treatments. Where the density of incidents resulting in death or serious injury is high, and the star rating is low (poor) it indicates something can be done to prevent future collisions where people are killed or seriously injured.

Road Safety Foundation (RSF) produce maps that show the statistical risk of fatal or serious injury crashes occurring. The risk is calculated by comparing the frequency of road crashes that result in death and serious injury with how much traffic each road is carrying. For example. the risk on a road carrying 10,000 vehicles a day with 20 crashes is ten times the risk on a road that has the same number of crashes but which carries 100,000 vehicles.

The latest available iRAP star ratings data is presented in Figure 14 and shows that the majority of the route has a 3-star rating. The Air Balloon Roundabout on the A417 and the A308(M) spur are the only 1-star sections of road on the route. An objective of the proposed RIS2 improvement scheme on the A417 known as 'the Missing Link' is to improve safety on this section of the route. There are also short sections of 2-star road on the A417 (north of Cirencester), A419 (Swindon to Cricklade) and on the A404 (north and south of Marlow).

Despite the 3-star designation of most of the route, analysis of STATS19 data for the period 2015-2018 shows that there remain sections of the route where people have been killed or seriously injured. The collisions recorded in 2015-2018 STATS19 data predates the completion of the M4 Junction 3 to Junction 12 all lane running smart motorway scheme. Figure 15 highlights the following sections of the route where collisions have resulted in a higher number of people being killed or seriously injured relative to the route:

- A417 approaches to the Air Balloon Roundabout (A417)
- A419 northbound between north Swindon and Cricklade
- M4:
    - mainline between Junction 17 and Membury services
    - mainline between Junctions 14 and 12 eastbound
    - mainline between Junction 12 and Bradfield westbound
    - mainline between Junctions 11 and 10 eastbound
    - mainline between Junction 10 to the Holyport Interchange (Junction 8/9) eastbound and westbound
    - mainline between Junctions 7 to 5 westbound
    - mainline between Junctions 6 to 4B eastbound

Improving safety and minimising collision rates is a key consideration for all routes

Whilst walkers, cyclists and horse riders are not permitted on motorways, interactions do occur at motorway junctions, and some unpermitted incursions to the mainline do occasionally happen. Reported collisions involving walkers, cyclists and horse riders are low, but remain a source of concern for National Highways.

Supporting data from the Road Safety Foundation on the percentage of collisions including fatal and serious injuries to walkers, cyclists and horse riders, on the route, shows greater proportions on the M32, the A417, the A404 at Marlow to the M40 Junction, the M4 mainline between Swindon and Reading (Junctions 15 to 12) and the M4 mainline between Junctions 4B and 10, including the Huntercombe Spur at Junction 7.

Key challenges

- The relatively higher number of people killed or seriously injured on the A417 approaches to Air Balloon Roundabout, the A419 and the M4 mainline on stretches along the route
- The number of collisions involving walkers, cyclists and horse riders on the M32, the A404, the A417, the M4 between Swindon and Reading and from Junctions 10 to 4B on the mainline

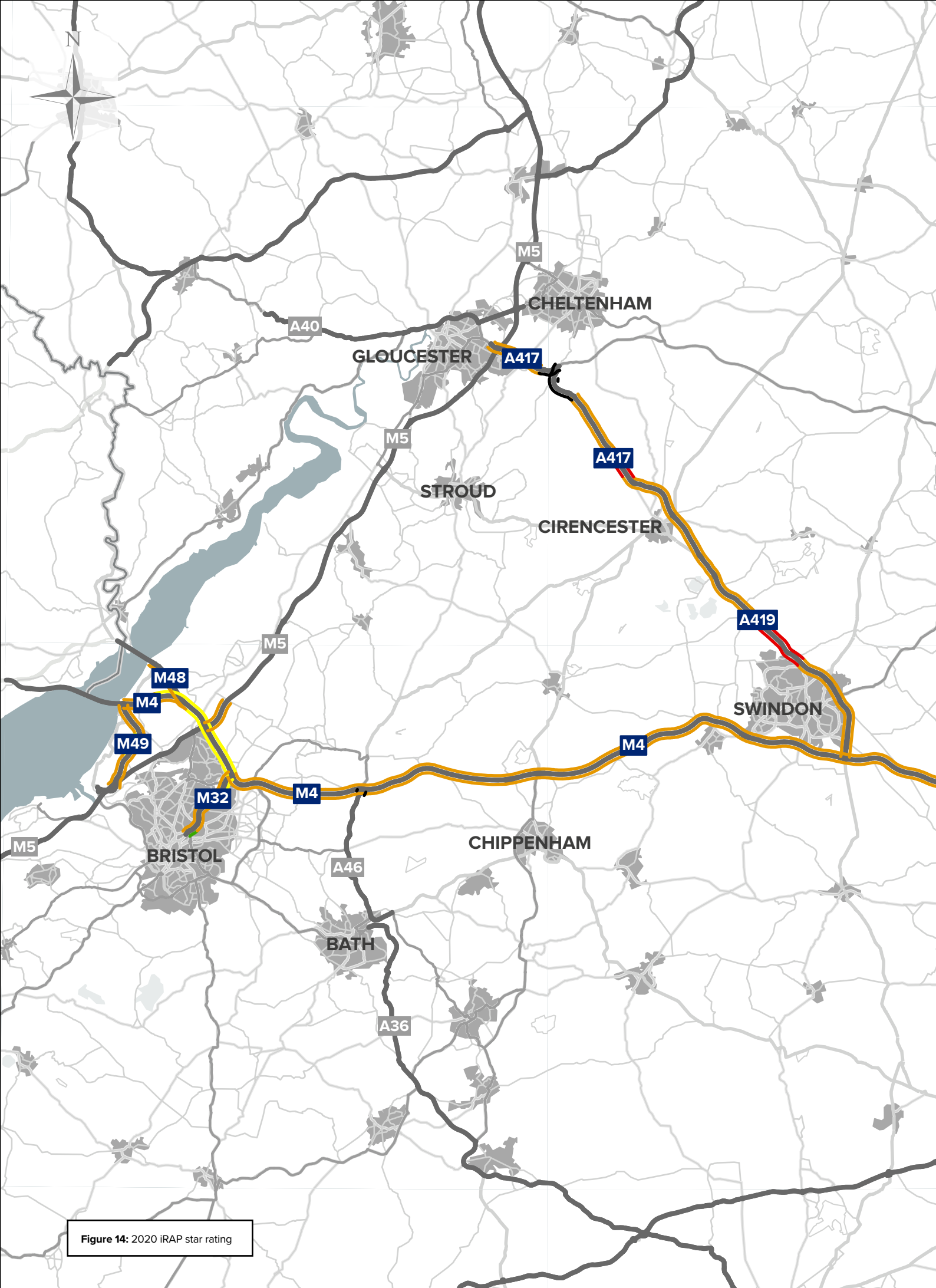
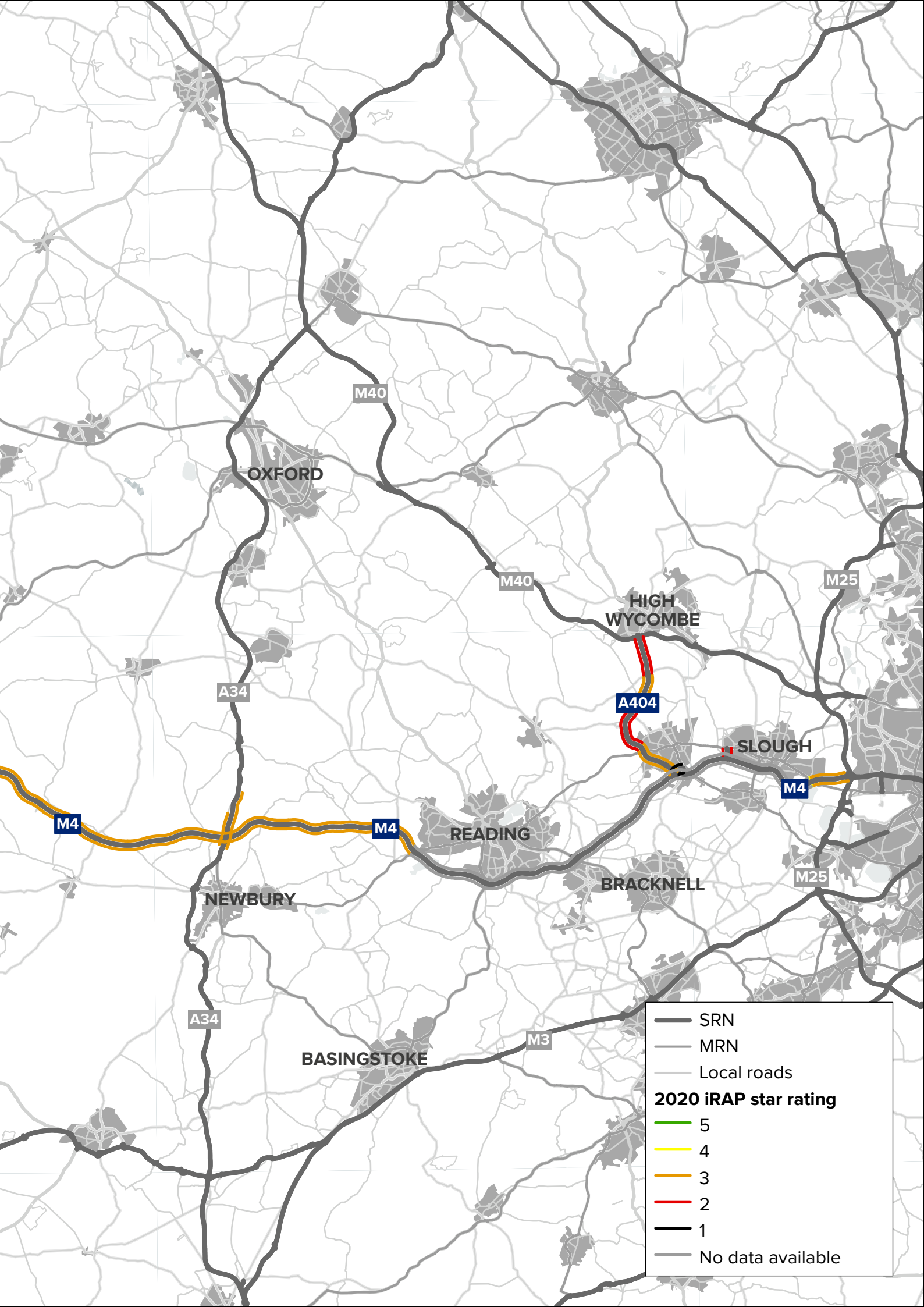


Figure 14: 2020 iRAP star rating

Esri UK, Esri, HERE, Garmin, FAO, METI/NASA, USGS. Contains public sector information licensed under the Open Government Licence v3.0.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A404
SLOUGH
M4
M4
M4
READING
BRACKNELL
M25
NEWBURY
A34
M3
BASINGSTOKE
SRN
MRN
Local roads
2020 iRAP star rating
5
4
3
2
1
No data available

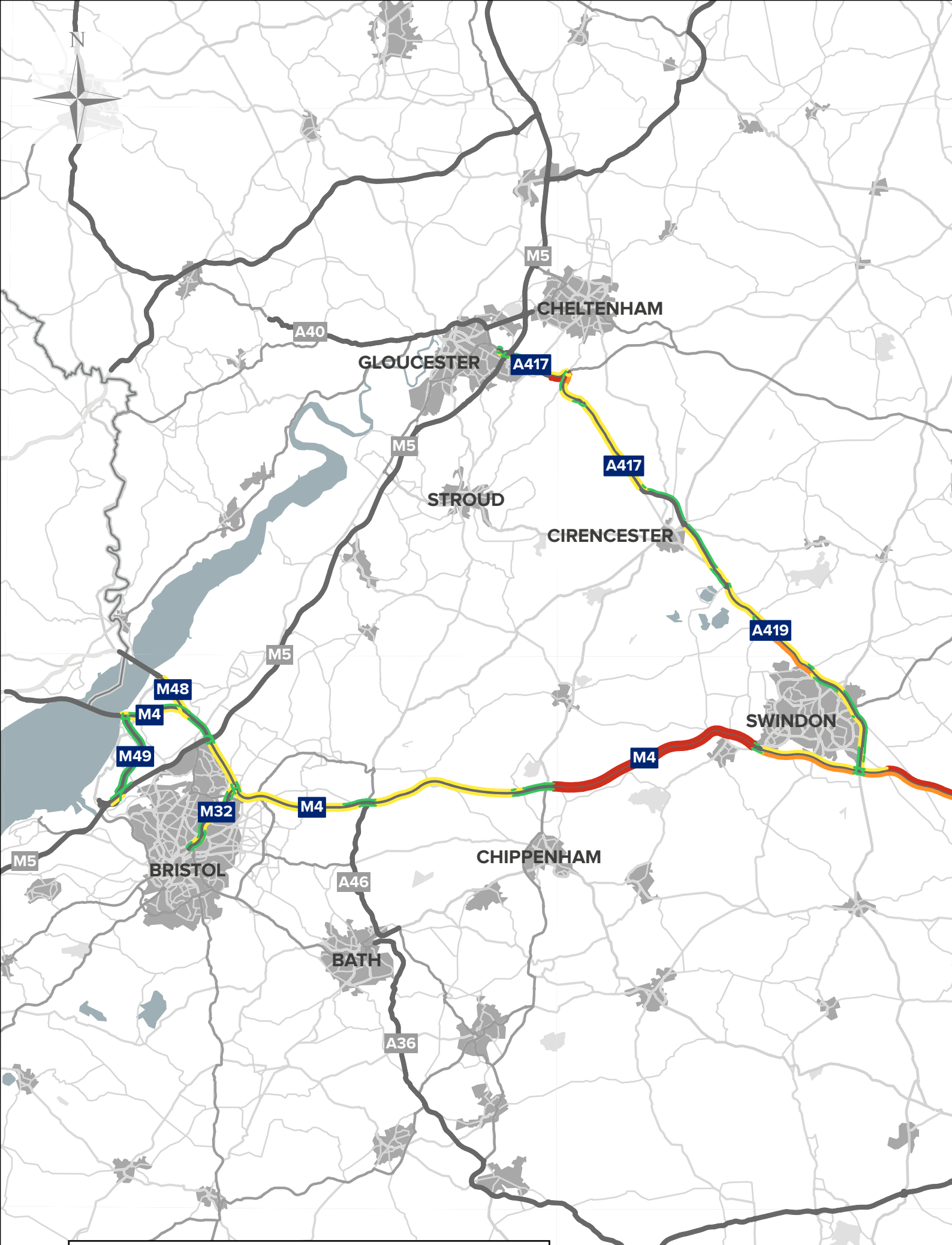

Figure 15: 2015-2018 Number of people who were killed or seriously injured (source: STATS19)

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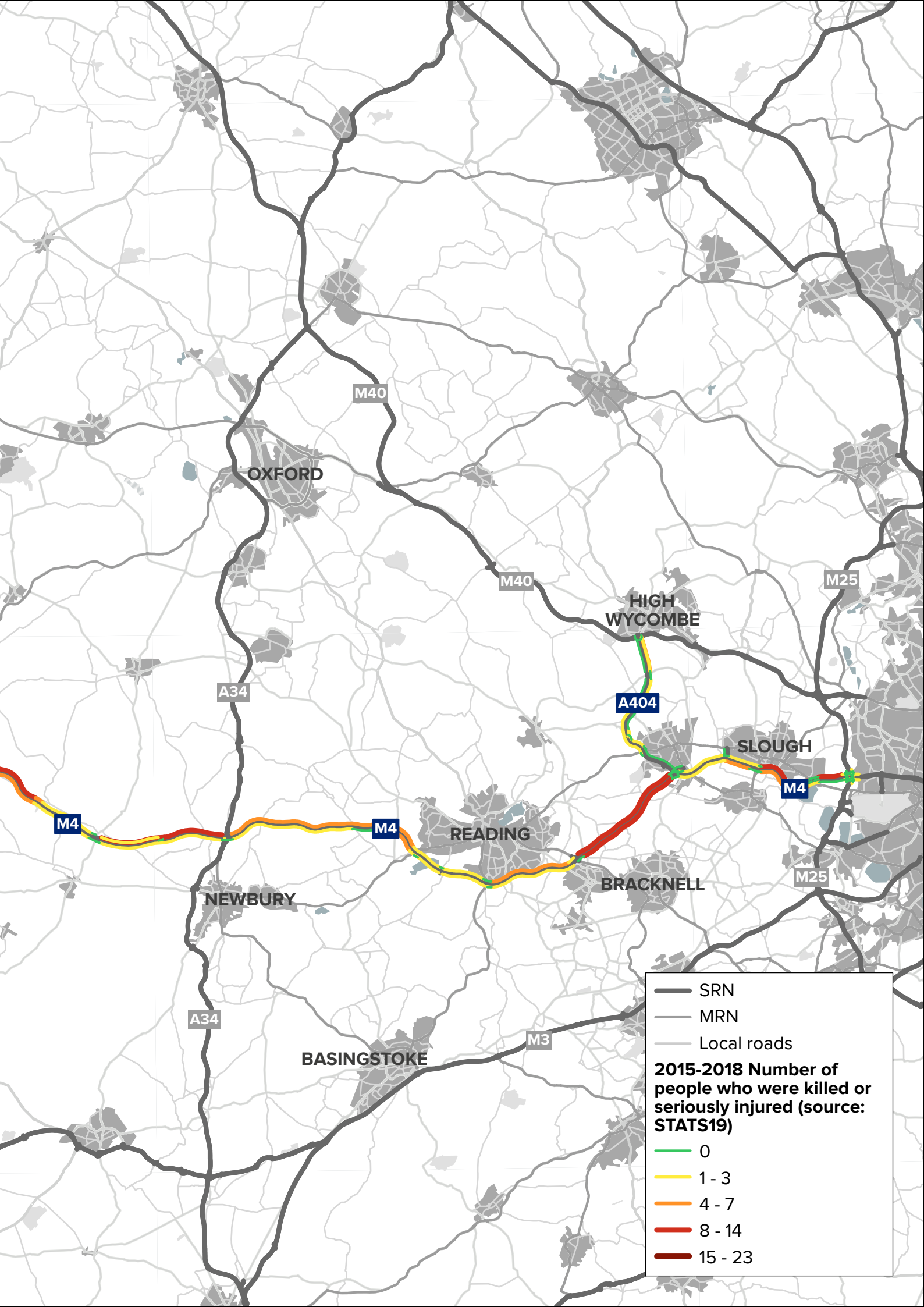
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A404
SLOUGH
M4
M4
M4
READING
BRACKNELL
M25
NEWBURY
A34
M3
BASINGSTOKE
SRN
MRN
Local roads
2015-2018 Number of people who were killed or seriously injured (source: STATS19)
0
1 - 3
4 - 7
8 - 14
15 - 23

2. Network performance

Network performance is measured by average peak period delay in the morning, seasonal delay, and journey time reliability. Many sections of the London to Wales route experience one or more of these types of delay.

During day-to-day operations, the route tends to perform relatively well in relation to average morning peak period delay.

Locations that experience relatively higher levels of average morning peak period delay on the route include:

- M32 mainline between Junctions 1 and 3 (122 seconds of delay on southbound approach to Junction 3)
- A417 mainline approaches to Air Balloon Roundabout (64 seconds of delay on the south arm, northbound approach to the Air Balloon Roundabout, 61 seconds of delay on the north arm, southbound approach to the Air Balloon Roundabout)
- A419 Swindon southbound approach to M4 Junction 15 (63 seconds of delay)
- A404 mainline north of Burchetts Green (54 seconds of delay, southbound approach to Bisham Roundabout) and the A404/M40 Handy Cross Roundabout (116 seconds on the southern arm approach)

We want to improve journey times on route sections which currently experience high levels of delay and are expected to worsen in the future

- A404(M) mainline southbound approach to Holyport Interchange (M4 Junction 8/9) (58 seconds)
- A308(M) mainline to Holyport Interchange (33 seconds of delay eastbound and 86 seconds of delay westbound).

With the exception of commuter peak times and tourist peak times, the route still performs well. Interested parties spoke of incidents on the M25 that can lead to knock-on impacts on the A404. Whilst the A404 relieves pressure on the network connecting the M4 to the M40, current performance is compromised by existing congestion at the Bisham roundabout.

The route has multiple locations with major employers, in particular in urban areas including Bristol, Reading, Cheltenham and Swindon.

Average peak period delay is measured in seconds per vehicle mile and is the difference between average delay in the morning or afternoon peak period and the average delay during free flow conditions.

Seasonal delay refers to the difference between the average afternoon peak delay for Fridays in August 2019 (high demand in summer holidays) and the average delay during very low demand periods (in this case, Christmas day is used). This measure is designed to reflect the parts of the network that do not appear to have a problem on average over the year but have seasonal peaks.

Seasonal delay is of interest to tourist traffic, particularly people travelling to airports, or other destinations where arriving later than intended could have significant implications.

Reliability is the difference between the typical travel time, allowing for average peak period delays, and the observed travel time. This measures the amount of variation due to unexpected variations or unplanned events. Like delay, it is measured in seconds per vehicle mile. It is a concern for most drivers, but particularly affects just-in-time freight traffic and other strategic journeys.

These serve as trip generators and, due to commuter travel, draw in traffic from connecting roads.

Where the two routes meet at M4 Junction 20 on the northwest fringe of Bristol, the M4 acts as a feeder to the M5 for access to the South West peninsula and during the seasonal periods there are impacts arising from this.

Sections of the route do experience seasonal delay. These include:

- M4 mainline between Junctions 21 and 18 (189 seconds of delay at Junction 20 westbound)
- A417 mainline approaches to Air Balloon Roundabout (159 seconds of delay on the south arm, northbound approach to the Air Balloon Roundabout)
- A419 mainline Swindon to M4 Junction 15 (50 to 70 seconds of delay)
- A404 mainline north of Burchetts Green (55 seconds of delay northbound and 74 seconds southbound) and the A404/ M40 Handy Cross Roundabout (73 seconds on the southern arm approach)
- A404(M) mainline southbound approach to Holyport Interchange (M4 Junction 8/9) (42 seconds of delay)
- A308(M) mainline to Holyport Interchange (32 seconds of delay eastbound and 143 seconds of delay westbound)
- M4 mainline between Junctions 7 and 4B (54 seconds of delay westbound, 66 seconds of delay at Junction 6 eastbound)

Supporting National Traffic Information Service (NTIS) HGV flow percentage data shows that areas with a higher percentage of heavy goods vehicles (HGVs) include:

- M4 Junction 21 to M48 Junction 1 (17-18% eastbound and 16-17% westbound)
- M4 mainline at Junction 16 westbound (16%)
- M4 mainline around Membury (16%)
- M4 mainline at Junction 19 westbound (16%)

During day-to-day operations, the route tends to perform relatively well in relation to reliability. Reliability is a concern for most drivers, but particularly affects just-in-time and freight traffic and other strategic journeys.

Sections of the route which are prone to have less reliable journey times include:

- M4 mainline between Junctions 20 and 19 (11 seconds of delay at Junction 20 westbound)
- M32 mainline between Junctions 2 and 3 (24 seconds of delay on southbound approach to Junction 3)
- A417 mainline approach to Air Balloon Roundabout (from Birdlip) (15 seconds of delay on the south arm, northbound approach to the Air Balloon Roundabout)
- A404 mainline between Burchetts Green Roundabout and the A404/M40 Handy Cross Roundabout (15 seconds on the southern arm approach to Handy Cross Roundabout)
- A404(M) mainline southbound approach to Holyport Interchange (M4 Junction 8/9) (11 seconds)
- A308(M) westbound approach to Holyport Interchange (29 seconds of delay)

National Highways has a suite of five regional traffic models (RTMs) covering England's SRN. The models allow us to identify future performance and delay on the network, assisting with the development of the route strategies. The RTM models use projected growth, expected trends and changes to the network (including National Highway's second Road Period schemes) to forecast the performance of the network in 2031, as shown in Figure 17.

Route performance is projected to decline with future increases in traffic flow demands, population and housing growth. Forecasts suggest that the greatest morning peak delay will occur at the following locations:

- A308(M) westbound (64 seconds of delay)
- A404 northbound approach (southern arm) to Bisham Roundabout (242 seconds of delay) and southbound (to Bisham Roundabout) (212 seconds of delay)
- M32 mainline at Junction 2 northbound (136 seconds of delay) and between Junctions 1 and 2 southbound (65 seconds of delay)

Key challenges

- Localised delays across the route, addressing congestion on the M4, A404 and A404(M), A308 (M), A417, A419 and M32
- Seasonal delay on the M4, A417, A419, A308(M), A404 and A404(M)
- The reliability of the M32, M4, A308(M) and A417

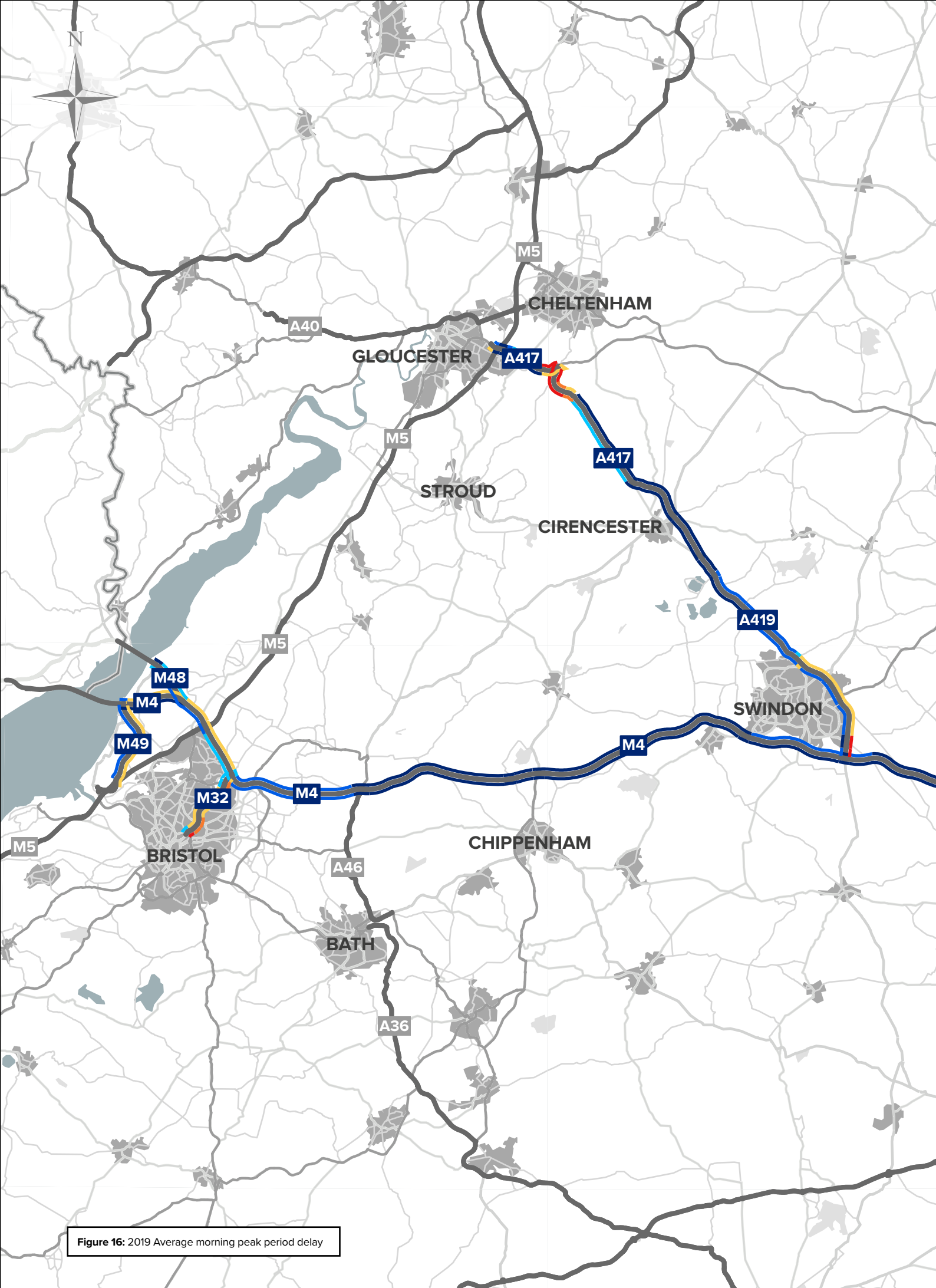

Figure 16: 2019 Average morning peak period delay

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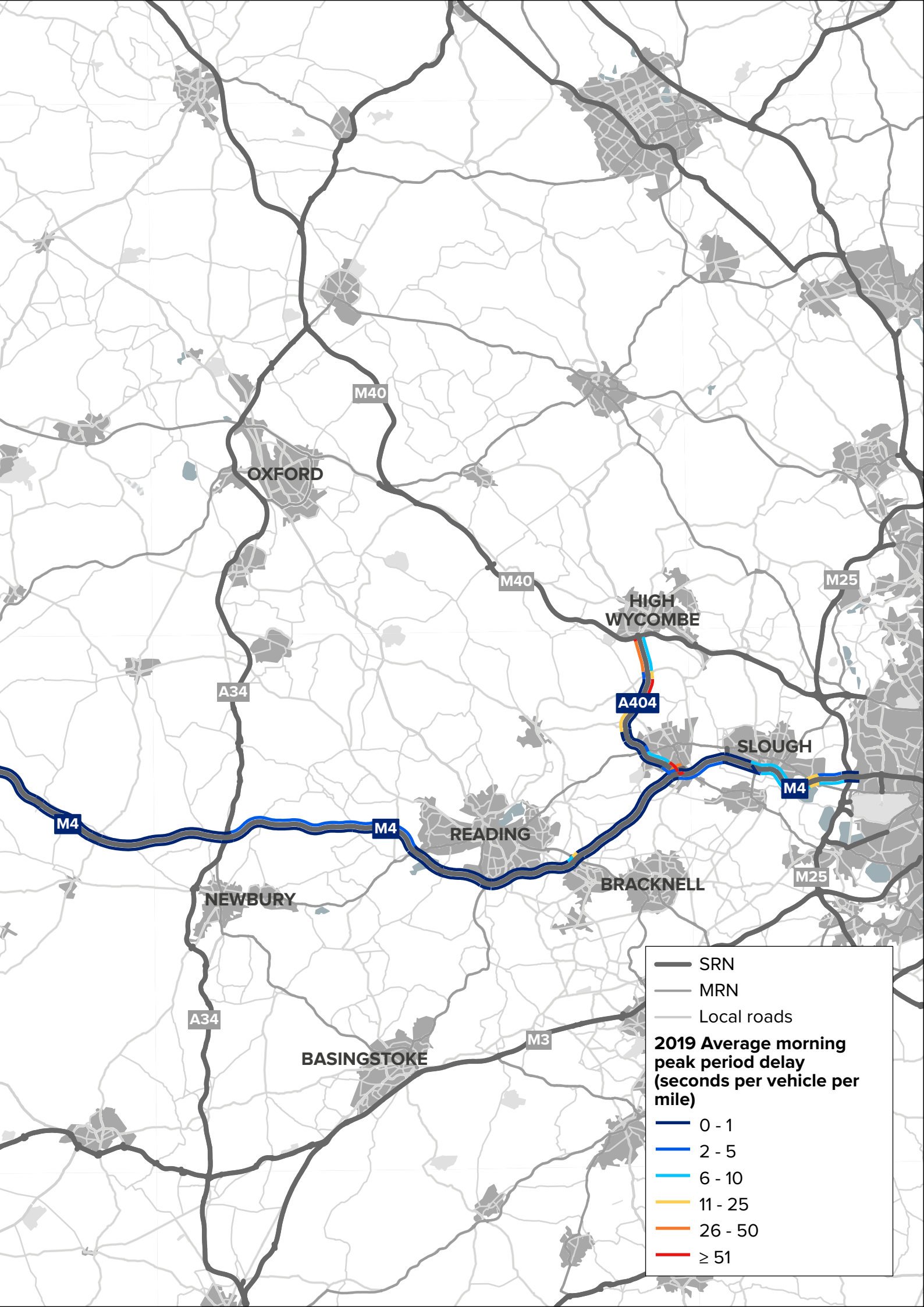
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M4
M4
READING
BRACKNELL
M25
NEWBURY
A34
M3
BASINGSTOKE
SRN
MRN
Local roads
2019 Average morning peak period delay (seconds per vehicle per mile)
0 - 1
2 - 5
6 - 10
11 - 25
26 - 50
≥ 51

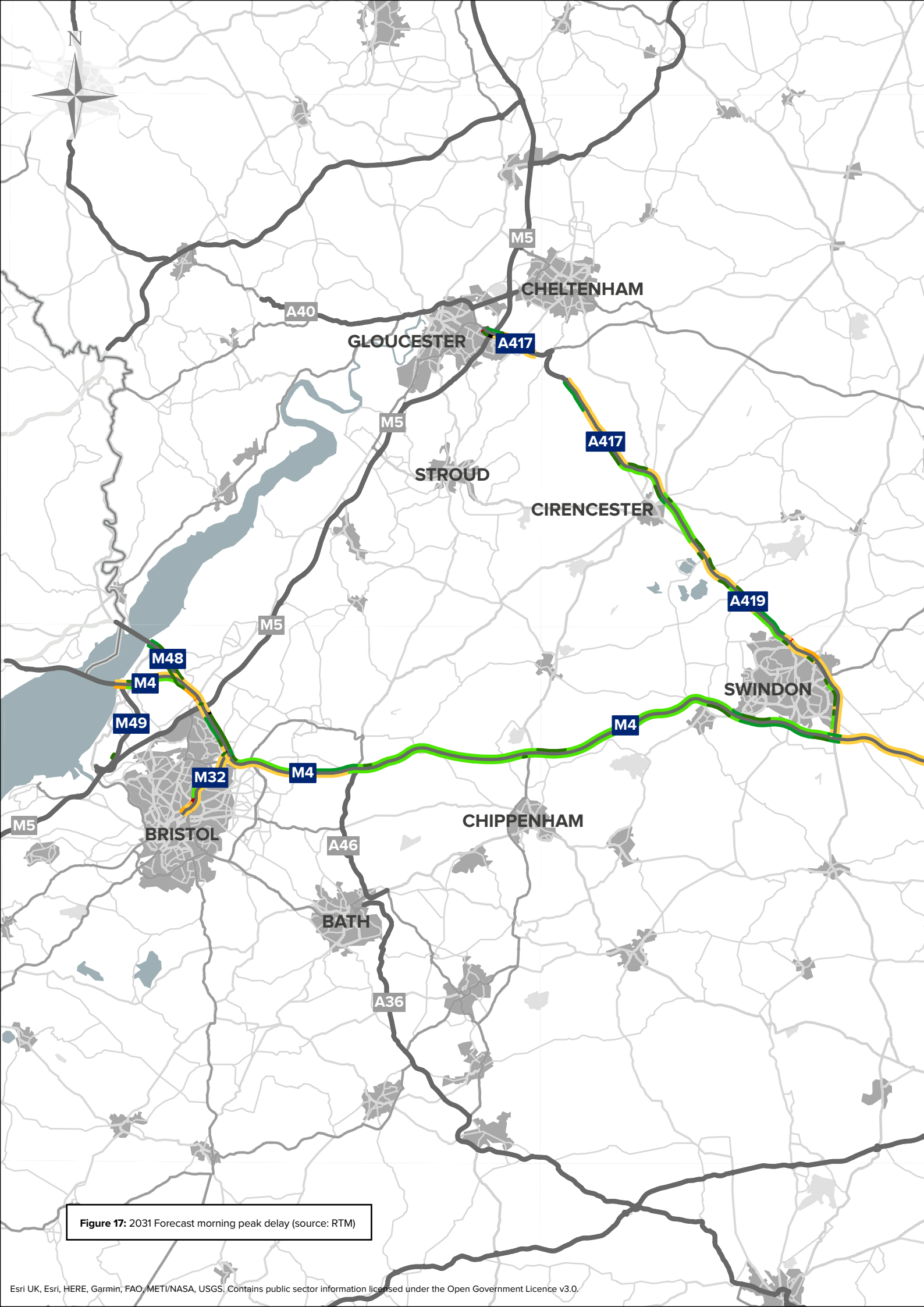
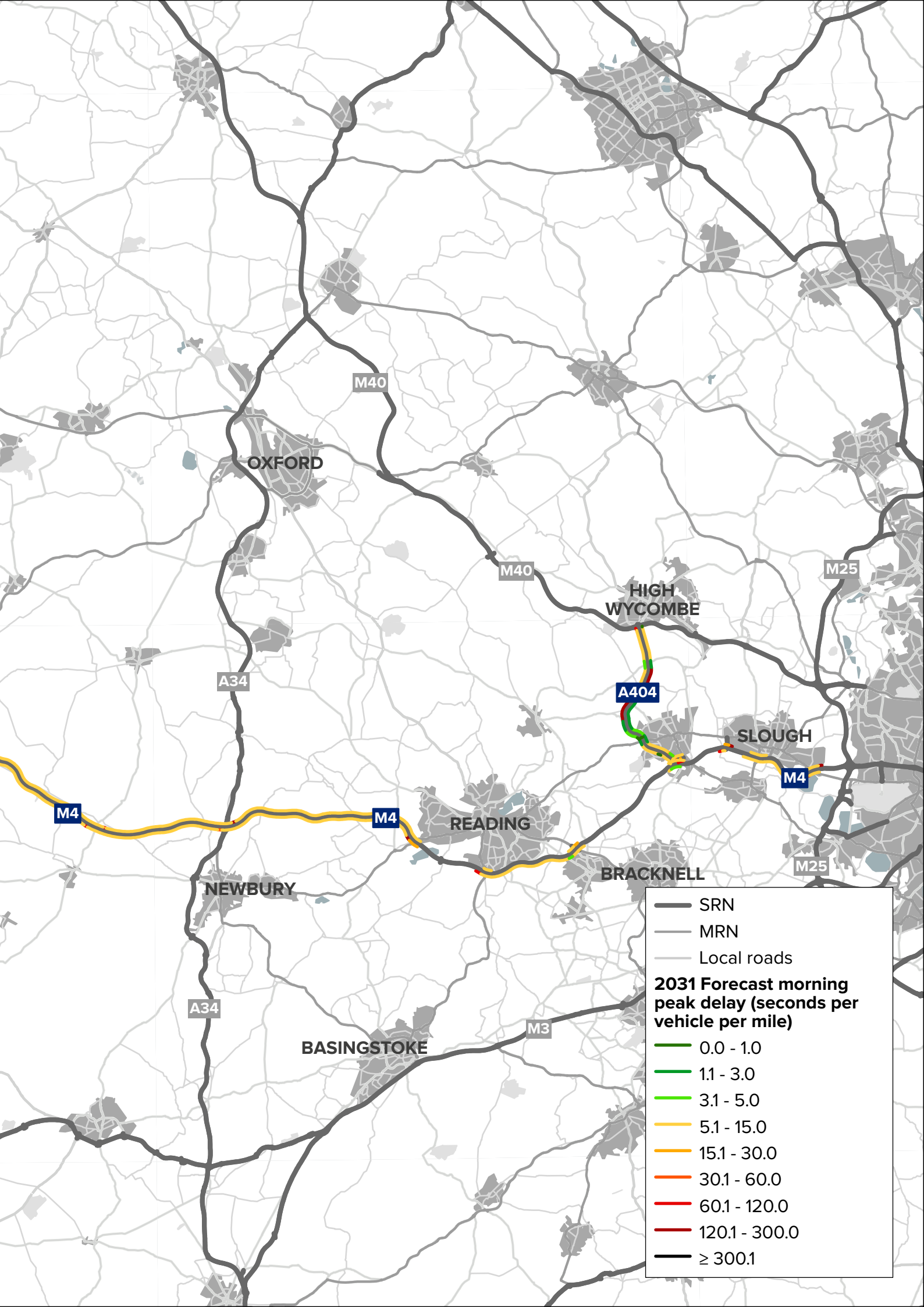


Figure 17: 2031 Forecast morning peak delay (source: RTM)

Esri UK, Esri, HERE, Garmin, FAO, METI/NASA, USGS. Contains public sector information licensed under the Open Government Licence v3.0.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A404
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M4
M4
READING
BRACKNELL
M25
NEWBURY
A34
M3
BASINGSTOKE
SRN
MRN
Local roads
2031 Forecast morning peak delay (seconds per vehicle per mile)
0.0 - 1.0
1.1 - 3.0
3.1 - 5.0
5.1 - 15.0
15.1 - 30.0
30.1 - 60.0
60.1 - 120.0
120.1 - 300.0
≥ 300.1

3. Improved environmental outcomes

Climate change is affecting society as a whole, and the transport sector is no exception. As the Government owned company tasked with building and maintaining the SRN, we need to show both how we can help tackle the causes of climate change and how we are preparing for a changing climate. In 2021 we published our *Net zero highways plan*[34] to show how we will meet the target of net zero greenhouse gas emissions.

The latest climate projections from the Met Office have helped us to understand how the climate is changing, including that summers will on average be hotter and drier, while winters will be milder and wetter and critically, that extreme weather will become more common. We have also seen, from reports such as the Climate Change Committee's third and most recent *Independent Assessment of UK Climate Risk*[35], that there are key risks from a changing climate for infrastructure, such as risks to bridges from flooding and erosion and risks to subterranean and surface infrastructure from subsidence.

Where possible we seek to protect environmentally important locations and reduce air quality and noise impacts on communities served by the route

We are committed to net zero carbon construction by 2040 and net zero carbon travel by 2050. This will involve significant changes to the way we build and manage our network, including on the London to Wales route. In the future, we will need to consider better integration with other transport modes and how to support the transition to electric cars and zero carbon heavy goods vehicles (HGVs).

Air quality describes how polluted the air we breathe is. Poor air quality can cause both short-term and long term effects on the health of humans and impact on sensitive ecological sites. The amount of air pollution depends on the concentrations of different substances in the atmosphere. The key pollutants in relation to traffic being oxides of nitrogen (including nitrogen oxide) and particulate matter. In the UK, the concentrations of these pollutants are regulated and regularly monitored. Local authorities have a duty to identify locations within their boundaries where thresholds are not being achieved. Where these are identified, they are required to declare an Air Quality Management Area (AQMA) and put together a plan to improve air quality in that area.

While noise is often an inevitable consequence of societal activities, it can have serious implications for human health, quality of life, economic prosperity and the natural environment. While there's no legal limit to road noise, environmental noise regulations in the UK require regular noise mapping and the creation of action plans for Noise Important Areas (areas exposed to the highest levels of noise).

Severance is where transport infrastructure or motorised traffic passes through settlements and acts as a physical or psychological barrier, limiting people's ability or desire to move through that area. This can reduce accessibility to key services, and damage local social networks and community cohesion.

34 National Highways, Net zero highways: *our 2030 / 2040 / 2050 plan,* https://nationalhighways.co.uk/media/eispcjem/net-zero-highways-our-2030-2040-2050-plan.pdf
35 Climate Change Committee, 2021, *Independent Assessment of UK Climate Risk*, https://www.theccc.org.uk/ publication/independent-assessment-of-uk-climate-risk/

The route has ecological, cultural and environmental sensitivities. Some of the route passes next to, and through, a number of Areas of Outstanding Natural Beauty including the North Wessex Downs, the Cotswolds and the Chilterns, and nearby culturally significant sites such as Windsor Castle.

In terms of air quality, there are receptors within 100 metres of the SRN which may be more likely to experience adverse air quality impacts at the following locations:

- M32 (mainline between Junctions 1 to 3)
- M4 (Junctions 19 to 20 westbound)
- A419 (Commonhead roundabout to A4311 Junction northbound)
- A419 (Junction at Cricklade to B4019 Junction southbound)
- M4 (Junctions 11 to 10 eastbound)
- A404 (M) (Holyport Interchange to A4)
- M4 (Junction 7 to 6) eastbound

An Air Quality Management Area (AQMA) was set up in Bray, in close proximity to Junction 8/9 of the M4 and the A404(M)/A308(M). Other sections of the M4 subject to an AQMA include between Junctions 9 to 12 south of Reading, between Junctions 5 to 7 south of Slough and the M32 corridor on approach to Bristol, the Air Balloon roundabout, as well as the A404 Junction with the M40. As well as AQMAs, a Clean Air Zone is set to be introduced in Bristol. Interested parties mentioned environmental improvement at, and around, High Wycombe as well its air quality issues in relation to the impact of the SRN on the immediate environment.

There are receptors within 300 metres of the SRN which may be more sensitive to high noise levels at the following locations:

- M32 (southbound)
- M4 (Junctions 19 to 20 westbound)
- M4 (Junction 19 to 18 westbound)
- A419 (Junction 15 of M4 to Junction at Stratton northbound)
- A419 (Junction with A4311 to Junction at Cricklade northbound)
- A419 (Mainline from Junction at Cricklade to Broad Blunsdon southbound)
- M4 (Junctions 11 to 10)
- M4 (Junction 7 to Holyport Interchange (Junction 8/9) westbound)
- M4 (Junction 7 to A4)
- M4 (Junctions 6 to 5 eastbound)
- M4 (immediately east of Junction 5)

Noise Important Areas (NIAs) for roads are based upon the Department for Environment, Food and Rural Affairs (DEFRA) strategic noise maps results and have been produced in line with the requirements set out in the noise action plans. NIAs within the route include:

- A404 (M) at Maidenhead
- M4 at Holyport
- M4 at Slough
- M4 south of Reading
- A419 Swindon
- M32 Bristol

The latest climate projections show that the area covered by the route is likely to see a range of effects, including increases in winter rainfall, sea level rise and warmer temperatures. This is likely to increase the risk of flooding and may increase pressures on the wider environment.

Climate change will present an increasing challenge to the resilience of the route. Periods of heavy rainfall are widely expected to increase in intensity and duration, whilst extremes of temperature may also impact maintenance needs. More intense and longer periods of rainfall will increase the risk of surface water flooding and could overwhelm existing drainage systems leading to localised flooding. Sections of the route currently considered to be at risk of flooding from surface water include:

- A404 at Marlow
- M4 at Bray
- M4 South of Reading

Interested parties raised the impacts of vehicles using the SRN upon local communities and highlighted the M32 and the M4 in the Berkshire authorities and the A419 in Swindon as locations of severance.

Interested parties would like to see reduced greenhouse gas emissions by providing alternative modes of travel and encouraging a lower share of journeys to be made by car, and better managing the SRN.

Key challenges

- Areas of Outstanding Natural Beauty as well as other environmental and cultural heritage designations
- Potential adverse air quality impacts at locations where there are receptors within 100 metres of the SRN which may be more likely to experience adverse impacts, flagged on the M32, M4, A419 and A404 (M)
- Receptors within 300 metres of the SRN which may be more sensitive to high noise levels, flagged on the M32, M4 and the A419.
- Resilience on the SRN in response to future climate change

4. Growing the economy

In order to understand the economic and housing growth aspirations of the area along the route we have considered key growth locations, such as those held in local plans and Freeports.

The *Union Connectivity Review*[36] assessed the existing transport network in the United Kingdom and sought to identify how it can better support economic growth, jobs, housing and social cohesion in England, Scotland, Wales and Northern Ireland. The Review identifies the South Wales – Greater Bristol area as a discrete cross-border economic area. Further to this, the London to Wales route is identified as a key transport corridor for the whole of the United Kingdom. The Review goes on to say that cross border journeys in South East Wales in the morning peak is 70% higher than those made to other regions of Wales in the morning peak, highlighting the importance of the route in its function to connect areas and regions and providing for the movement of people and goods. The route directly supports a number of economic centres and sectors and is set to be a key part of future growth. The importance of the route is outlined in a number of Strategic Economic Plans for Buckinghamshire, Thames Valley Berkshire, Swindon and Wiltshire, GFirst and West of England Local Economic Partnerships (LEPs). These priorities are highlighted in the strategies of the Sub-national Transport Bodies of the Western Gateway, England's Economic Heartland and Transport for the South East.

> The strategic road network has a critical economic function in supporting national and cross-border connectivity and areas with high levels of deprivation

Key economic centres and sectors that are supported by the route include:

Within Berkshire, sectors such as communications and information technologies, distribution and logistics; life sciences, healthcare and their associated corporate national/ international offices, are dominant, and in addition support thriving small and medium enterprises.

Significant housing growth is planned, including locations at Reading, and noted in the *Wokingham Local Plan Update*[37] including Arborfield Garrison, Hall Farm and Loddon Valley east of Shinfield, and land adjacent to the M4 Junction 11.

36 Sir Peter Hendy CBE, 2021, *Union Connectivity Review Final Report,* https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1036027/union-connectivity-review-final-report.pdf

37 Wokingham Borough Council, 2022, *Wokingham Local Plan Update: Revised Growth Strategy Consultation, November 2021 to January 2022* https://www.wokingham.gov.uk/planning-policy/planning-policy-information/local-plan-update/#:~:text=Latest%20news,to%20everyone%20who%20got%20involved

From the engagement with interested parties, for this area, there were several developments mentioned, namely Reading Green Park, which is due to open in 2022 and an upgrade to park and ride status for Theale station at Junction 12, the expansion of Thames Valley Science Park, and developments in Wokingham. Further to this is the potential Heathrow Western Rail Link from the Great Western Main Line.

Within the *Maidenhead Borough Local Plan*[38] there is a desire to focus strategic growth within Maidenhead town centre and south west Maidenhead as part of the Maidenhead Growth Area in proximity to the M4, A404(M) and A308(M).

Within Swindon and Wiltshire, advanced manufacturing, manufacturing services and distribution and logistics are dependent on the route. Developments mentioned by interested parties include a storage and distribution facility proposed in South Marston, Swindon and growth east of Swindon.

Other regionally significant developments noted within the *Swindon Borough Local Plan*[39] include residential developments to the north of the town at Tadpole Farm and Kingsdown and the strategic Eastern Villages site to the east of the A419 which could accommodate up to 8,000 dwellings along with employment allocations at Wichelstowe adjacent to the M4 and at Commonhead west of the A419.

Around Bristol, aerospace, advanced manufacturing as well as the importance of education, research and development are strongly linked to good connectivity. Developments mentioned by interested parties in this area include the Bristol Temple Quarter Masterplan, expansion at the Port of Bristol such as logistics developments at Avonmouth and growth in the north of South Gloucestershire.

The Filton area to the north of the city includes the Filton Enterprise Area earmarked for future employment land within the *South Gloucestershire Council Employment Land Review*[40] and will also be the proposed site of the Bristol Arena development.

Around Cheltenham and Gloucester, existing and future economic ambitions include cyber security, distribution and manufacturing. The effective movement of people as well as goods are critical to meeting these ambitions. Developments mentioned by interested parties in this area include the Golden Valley development. This will comprise residential and employment uses, including the nationally significant Cyber Central development.

In the context of deprivation, the highest levels, namely the top 5% most deprived in the country are exhibited in urban areas, including pockets of south Reading, south Gloucester, east Swindon and adjacent to the M32 in Bristol.

Levelling up funding is split across categories 1, 2 or 3, depending on their identified level of need, with category 1 representing places deemed in most need of investment through this fund. Within the route there are no areas classified as category 1.

Key challenges

- Managing and responding to the impacts of sustainable development where growth is anticipated; Reading, Maidenhead, Swindon, the Greater Bristol area, Cheltenham and Gloucester, and Wokingham
- Importance of the route in underpinning thriving local and sub-national economies and sectors
- The need for good and improved connectivity not only for the movement of goods but also people, particularly for the grouping and future growth of key sectors

38 Maidenhead Borough Council, 2022, *Maidenhead Borough Local Plan, Policies Map 1,* https://www.rbwm.gov.uk/home/planning-and-building-control/planning-policy/development-plan/adopted-local-plan
39 Swindon Borough Council, 2015, *Swindon Borough Local Plan 2026 Swindon: Planning for our future,* https://www.swindon.gov.uk/downloads/file/3988/swindon_borough_local_plan_2026
40 South Gloucestershire Council, 2022, *Employment Land Review, Core Report,* https://beta-edit.southglos.gov.uk/wp-content/uploads/1.-SGC-ELR-Core-Report.pdf

5. Managing and planning the SRN for the future

Maintaining the strategic road network

We deliver a comprehensive programme of maintenance to keep our assets in the right condition to provide our customers with the right level of service; ensuring that the road network remains safe and fully open for use. We collect data on the condition of all of our assets so that our teams of specialist engineers can fully understand their current condition and identify the optimum time to intervene, maintaining the asset and replacing parts before they fail and impact customer journeys.

Our asset inspections to collect much needed condition data are undertaken through a number of methods - survey vehicles collecting road surface condition for the whole of the network every year right through to structures inspections, where we undertake over 23,000 inspections of individual structures every two years. The majority of our asset routine maintenance activities and the replacement of thousands of asset components as they near end of life are undertaken at night to minimise work is never seen.

Road surface

The measure for road surface condition has been updated for 2022/23 onwards. The condition is reported as one of our Key Performance Indicators (KPI3) and shows the condition of all available lanes of the main carriageway (excluding DBFO lengths) based on 3 elements of the road surface condition namely - the levels of surface rutting (caused by wheel tracks being formed in the surfacing), skid resistance (how slippery the road is) and longitudinal profile (how bumpy the road feels) with a target of 96.2% or more in good condition. At the time of publication, the road surface had a score of 96.7% in good condition, thereby meeting the national surfacing condition target.

This route consists of approximately 1100 lane-km of road surfacing. The surface condition across the route is considered to be sound, with 99% of pavement asset not requiring investigation for possible maintenance.

Bridges and structures

There are 826 structures across the route, including bridges and large culverts. According to an analysis of current data, 90% of our structures are in very good or good condition. By carrying out inspections of each individual structure every two years, we identify any defects that may require maintenance, thereby helping to ensure that structural components are replaced before they fail.

Figure 18 below shows how investment in this route has improved the average condition scores of structures, since 2006. The average condition score is derived from asset inspections on structural components, accounting for the relative importance and size of each component. If no maintenance or renewals were planned, the scores would be expected to decline from 100 (perfect) as the structures deteriorate over time. We have a rolling renewals programme to replace asset components identified in our inspection programme, improving the structure condition to ensure all structures remain in a safe condition and fully open for use.

We have identified significant structures renewals for RIS3, and these schemes affect 14 structures in this route. M32 Junction 2 Eastville Viaduct requires significant renewal including provision of noise mitigation. This will be a major renewal scheme covering a long time period.

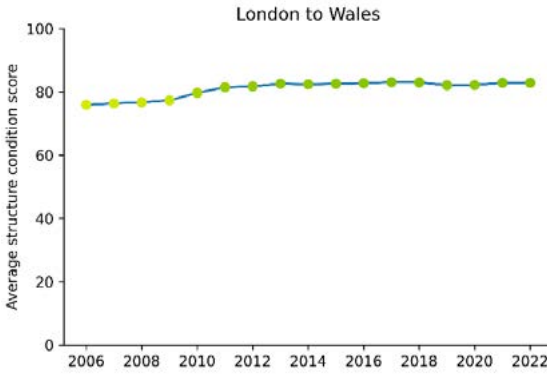

Figure 18: Average condition scores of structures, since 2006

Drainage

Drainage assets are represented by both linear assets (for example underground pipes, channels, ditches, drains) and nonlinear assets (for example gullies and chambers). At national level, 90% of the drainage assets are in good structural condition and 87% are in good service condition.

Geotechnical features

The geotechnical asset, comprising over 12,000km of earthworks embankments and cuttings carrying the road network is assessed through a programme of inspections and rated for its ability to provide the right level of safe functionality. The condition assessment of this asset is that 99.61% is in good condition to continue to function correctly. We use the inspection surveys to identify where any of our geotechnical features may require maintenance now or in the future, to ensure they are never at risk of failure.

Future developments

We have been transforming our approach to maintenance through our Operational Excellence and Asset Management Transformation Programmes. Bringing our key asset maintenance decision making and planning activities back in-house so that our own staff are responsible for planning maintenance activities, along with improving the consistency of our end to end maintenance and asset replacement programmes will bring significant benefits. Our asset management transformation also includes the improved analysis to identify the investment required on the strategic road network during the next road period. The business case will provide evidence to support future maintenance investment, clearly articulating the costs and benefits of delivering an effective maintenance and asset replacement programme.

Operations

We are establishing a nationally consistent approach to the management of our operational capability through our Operational Excellence change programme. This will deepen our understanding of how our interventions impact on the performance of the network and on the journeys of our customers. We are using the latest analytical software to process traffic data and gain insight into:

- How our operational services can improve safety and provide security to road users
- How the attendance of a traffic officer has an impact on incident durations
- How information provided by National Highways can benefit road users who plan their journeys beforehand and while on their journeys

By better understanding our current operational performance, we can create a baseline from which we can identify opportunities for improvement.

Key challenges

- Contributing toward the national target of 96.2% or more of carriageway being in good condition
- Maintaining the good condition of the SRN's geotechnical assets
- Ensuring that drainage assets are maintained so that their good structural and service conditions can be upheld

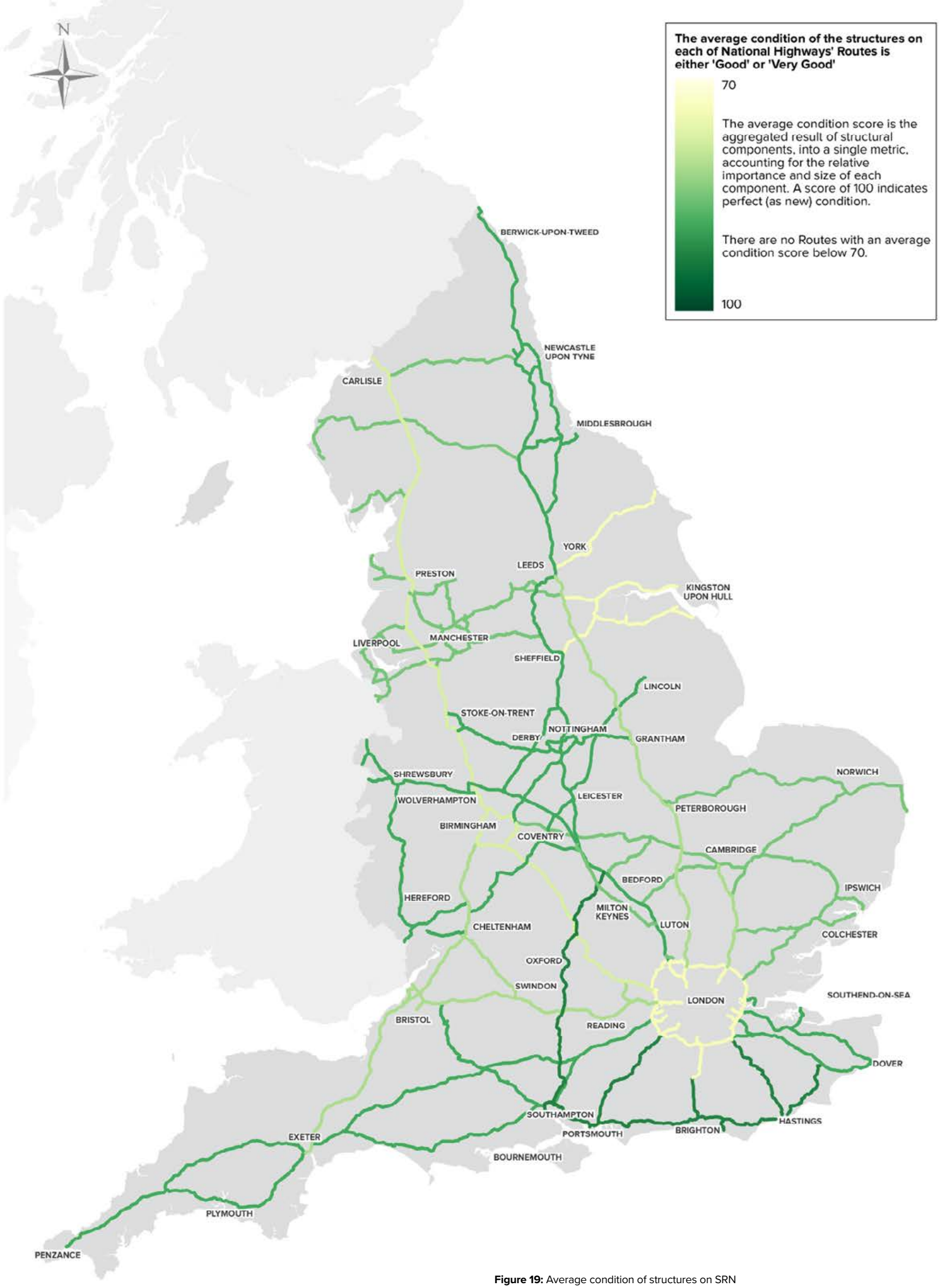

Figure 19: Average condition of structures on SRN

6. A technology-enabled network

Technology will have an increasing role to play in managing incidents and providing information to users of the route. Communication with road users is a vital component of route management for incidents, events, festivals, sports events and agricultural shows, particularly where these coincide with daily or seasonal peak traffic periods.

High quality travel information before and during travel helps to:

- reduce day-to-day delays and improve reliability of the SRN
- minimise the adverse impacts of incidents
- improve quality of journey experience
- allow people to make more informed travel choices including about when and how to travel

On the route, electric vehicle charging infrastructure is present on the M4 at Moto Reading, Chieveley services, Membury services and Leigh Delamere services. Other locations on the route include Junction 4 of the M40 where it meets the A404 (Handy Cross roundabout) and Severn View services on the M48. Further afield in the area surrounding the route there is electric vehicle charging infrastructure on the A417 in Gloucester, Marlow, via roads near to M4 Junctions 12 and 13 and Almondsbury. The current provision is strategically placed between London to Wales, with charging points often located at service stations.

On the all-purpose trunk roads (non-motorway) in the route area, the provision of electric vehicle charging points is more limited and may discourage the uptake of electric vehicles by users of these roads.

We will support improved communications and facilities for all

The M4 is dynamic hard shoulder smart motorway between Junctions 19 to 20 north of Bristol and all lane running smart motorway from Junctions 8/9 to 12 within the Berkshire authorities. In terms of communicating with road users, the M4 includes variable message signs and signals, between Junctions 19 to 20 north of Bristol and also at Junction 4B where the M4 meets the M25. Works at Junctions 3 to 8/9 have been completed in 2022.

The Government's March 2022 *UK electric vehicle infrastructure strategy*[41] sets out a vision for 2030 where charging infrastructure will be removed as both a perceived and real barrier to the adoption of electric vehicles. The Strategy outlines the intention to accelerate the rollout of high-powered chargers on the SRN through the £950m *Rapid Charging Fund*.[42]

Key challenges

- Communication with customers provides a key role in managing incidents and events, with potential opportunities to integrate new technologies
- Demand for increased quantity, capacity and speed of existing electric vehicle charging facilities
- Planning for increased use of new technology, including connected and autonomous vehicles and hydrogen fuelled vehicles

41 UK Government, March 2022, *UK electric vehicle infrastructure strategy,* https://www.gov.uk/government/publications/uk-electric-vehicle-infrastructure-strategy
42 UK Government, September 2021, *Rapid Charging Fund,* https://www.gov.uk/guidance/rapid-charging-fund

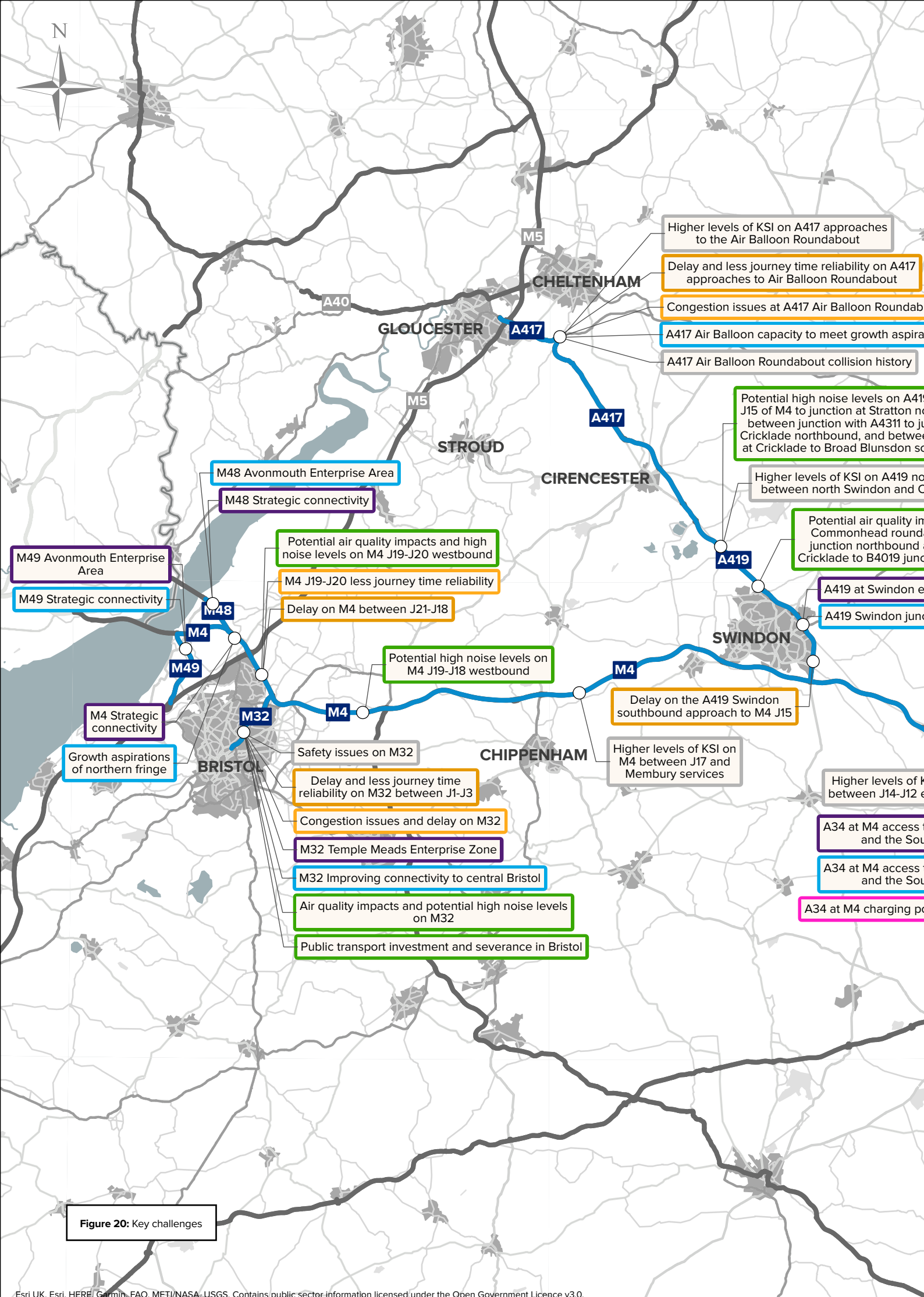

Figure 20: Key challenges

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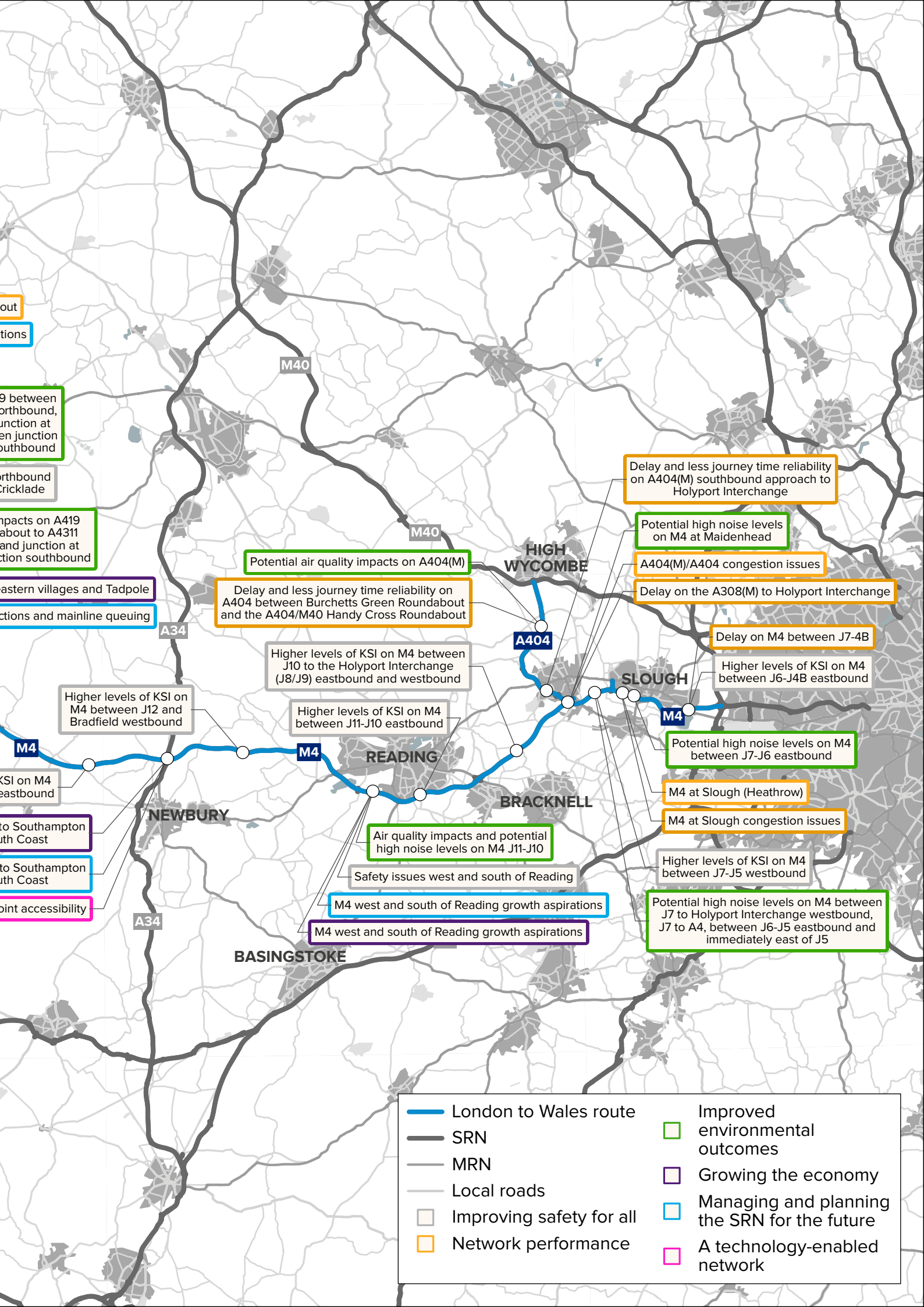
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to Southampton
uth Coast
oint accessibility
NEWBURY
A34
BASINGSTOKE
M40
Potential air quality impacts on A404(M)
Delay and less journey time reliability on A404 between Burchetts Green Roundabout and the A404/M40 Handy Cross Roundabout
Higher levels of KSI on M4 between J10 to the Holyport Interchange (J8/J9) eastbound and westbound
Higher levels of KSI on M4 between J12 and Bradfield westbound
Higher levels of KSI on M4 between J11-J10 eastbound
M4
READING
Air quality impacts and potential high noise levels on M4 J11-J10
Safety issues west and south of Reading
M4 west and south of Reading growth aspirations
M4 west and south of Reading growth aspirations
HIGH WYCOMBE
A404
Delay and less journey time reliability on A404(M) southbound approach to Holyport Interchange
Potential high noise levels on M4 at Maidenhead
A404(M)/A404 congestion issues
Delay on the A308(M) to Holyport Interchange
Delay on M4 between J7-4B
Higher levels of KSI on M4 between J6-J4B eastbound
SLOUGH
M4
Potential high noise levels on M4 between J7-J6 eastbound
M4 at Slough (Heathrow)
M4 at Slough congestion issues
BRACKNELL
Higher levels of KSI on M4 between J7-J5 westbound
Potential high noise levels on M4 between J7 to Holyport Interchange westbound, J7 to A4, between J6-J5 eastbound and immediately east of J5
London to Wales route
SRN
MRN
Local roads
Improving safety for all
Network performance
Improved environmental outcomes
Growing the economy
Managing and planning the SRN for the future
A technology-enabled network

Our ambition for the route

06 Initial route objectives

We want to provide safer and more reliable journeys for all those who use or live alongside our network on the London to Wales Route, and help the region achieve its economic and housing growth ambitions. Based on our engagement and data analysis, we have defined six route objectives for the area.

We developed the route objectives based on:

- feedback from customers and neighbours outlined in Chapter 3
- opportunities to collaborate with other network operators, outlined in Chapter 4
- constraints and challenges, as highlighted in Chapter 5
- how best to contribute to the DfT's six strategic objectives

Each route strategy includes a series of specific route-based objectives. These objectives, informed by extensive data analysis and engagement with customers and neighbours, set out our ambition for each route. Although route objectives are route-specific, they should also be considered in the context of our commitments and ambitions for the whole network, as per our Licence agreement. This means that, while we may identify certain locations within a route for further consideration, we will seek to address these locations in line with our ongoing commitment to achieving our safety, environmental and technology obligations across the SRN.

It should be noted that there is overlap between the objectives, and we recognise they cannot be considered in isolation from each other. They should be considered alongside our asset plan.

The route objectives, their supporting narratives, and locations for further consideration will together inform the development of the R*oad investment strategy* (RIS). They do not represent a commitment to road-based interventions but are intended to enable multimodal interventions to be explored as part of later study phases. It should be noted that the route objectives do not signify an assurance of investment in a particular route, nor do they remove the need to follow statutory processes.

As these are initial route objectives subject to wider feedback, we have not at this stage set out in detail how we will measure progress against them. Understanding how interventions and initiatives have addressed the challenges identified is a complex and long-term task and the approach to it will need to be devised alongside the wider performance specification for the third road period. We expect to set out our approach to this more clearly in the finalised route strategy overview reports to be published alongside our *Strategic business plan* and *Delivery plan* later in this road period.

Route objectives and DfT's strategic objectives

In Figure 21 we illustrate the six route objectives on our route map and, in Table 1, we show how they contribute to the Government's strategic objectives for our network as a whole.

Table 1: How the route objectives map to the DfT's six strategic objectives for the route

	Ref	Route objective
	**A**	**Safe and reliable journeys** Provide safe and reliable journeys through provision of a resilient and consistent route particularly on the M4, in the Berkshire authorities, Bristol, and the A417.
	**B**	**Strategic connectivity and access to key gateways** Promote strategic connectivity between England (M49, M4, M48, M5 and M32) and South Wales as well as facilitating efficient access to key gateways at Heathrow Airport, Port of Bristol and Bristol Airport.
	**C**	**Support regionally significant and sustainable economic development in the Berkshire authorities, Swindon and Bristol** Support the delivery of regionally significant and sustainable economic development in the Berkshire authorities, Swindon and Bristol whilst maintaining the safe and effective operation of the network.
	**D**	**Support local connections and integration** Support effective local connections and integration with other transport modes to reduce short-distance travel demands on the SRN and promote the transfer to alternative modes of transport and reduce carbon particularly in the Berkshire authorities, Bristol and Swindon.
	**E**	**Support the needs of the freight sector** Support regional and national economies through the efficient movement of freight on the M4 and A417/A419, by enhancing lorry parking and driver facilities along with the transfer of freight to alternative modes, where appropriate.
	**F**	**Reduce adverse impacts on communities** To be a better neighbour by safeguarding the environment and reducing the impacts of severance, adverse air quality and noise on local communities along the M4 in Reading, the M4 and M32 in Bristol and the A417/A419 in Swindon.

DfT's strategic objectives for our route

Improving safety for all	Network performance	Improved environmental outcomes	Growing the economy	Managing and planning the SRN for the future	A technology-enabled network
✓	✓				
	✓		✓		
	✓		✓		
	✓		✓		✓
	✓		✓		
✓		✓			

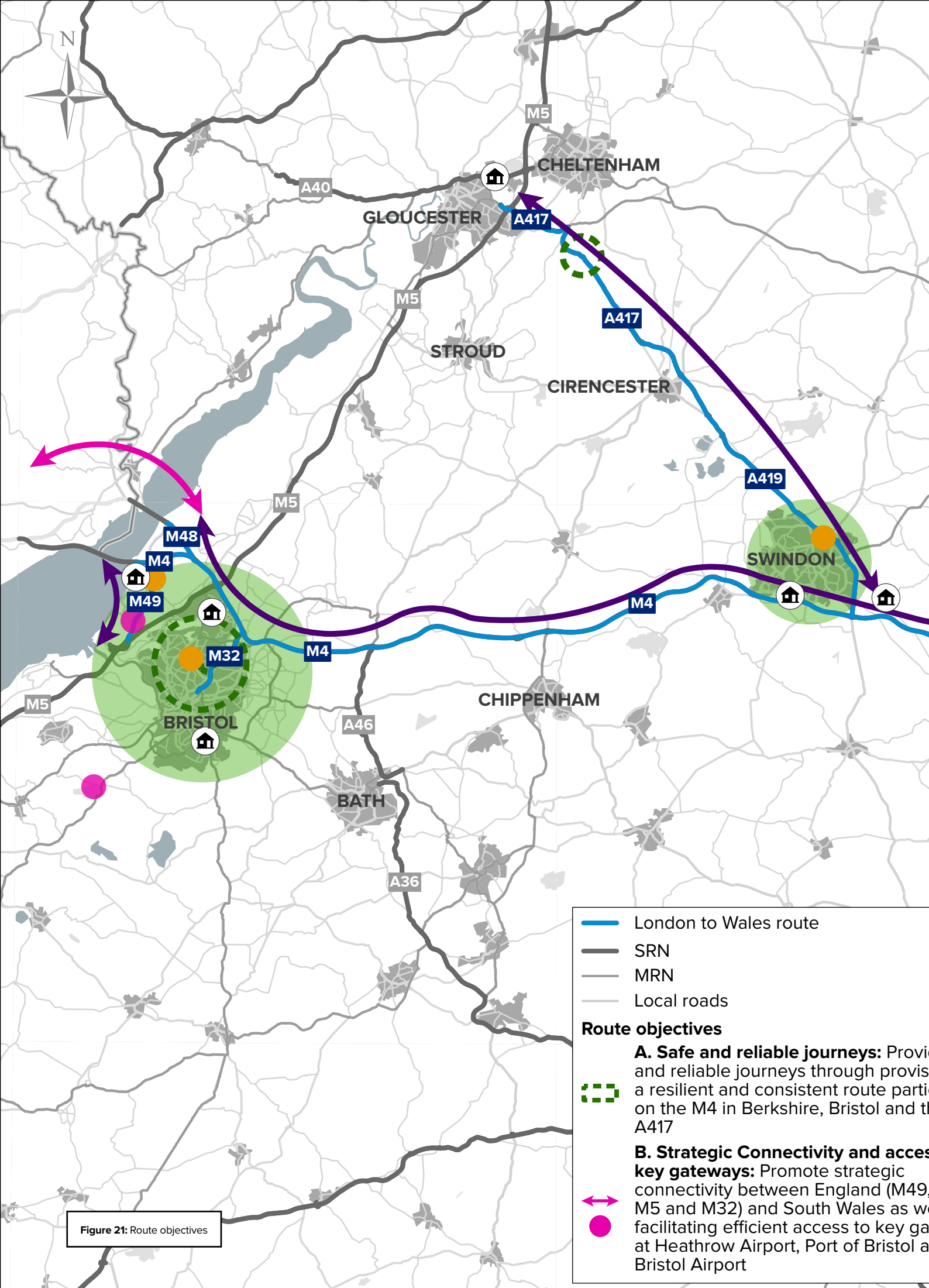

Figure 21: Route objectives

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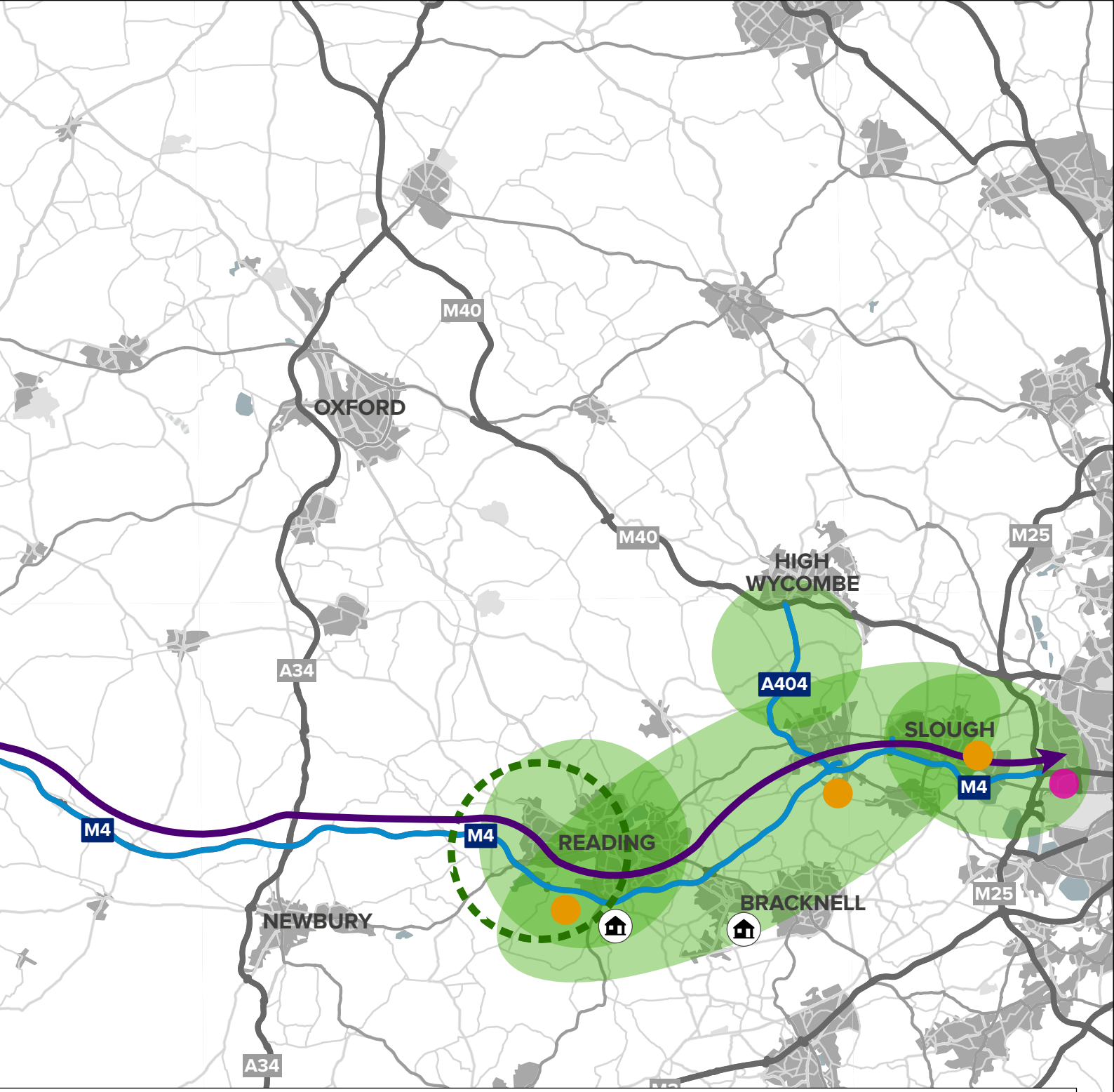

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C. Support regionally significant and sustainable economic development in the Berkshire authorities, Swindon and Bristol: Support the delivery of regionally significant and sustainable economic development in Berkshire, Swindon and Bristol whilst maintaining the safe and effective operation of the network

D. Support local connections and integration: Support effective local connections and integration with other transport modes to reduce short-distance travel demands on the SRN and promote the transfer to alternative modes of transport and reduce carbon particularly in the Berkshire authorities, Bristol and Swindon

E. Support the needs of the freight sector: Support the needs of the freight sector, including transfer to alternative modes of transport where appropriate, to support the regional and national economy by the efficient movement of goods on the M4 and A417/A419

F. Reduce adverse impacts on communities: To be a better neighbour by safeguarding the environment and reducing the impact of AQMAs and noise on local communities along the M4 in Reading, the M4 and M32 in Bristol, and the A417/A419 in Swindon

A. Safe and reliable journeys

Objective

Provide safe and reliable journeys through provision of a resilient and consistent route particularly on the M4 in the Berkshire authorities, Bristol, and the A417.

Context

Areas mentioned by interested parties as locations with both congestion and safety issues include the M32 corridor, the A436 adjoining the A417 Air Balloon roundabout, the A417, and the A419.

iRAP safety data indicates that single carriageway sections of the A417, and either side of the junction with the A436, are 1-star sections of the route. It is noted that the Air Balloon Roundabout adjoining the A436 is part of the A417 'Missing Link' RIS2 major improvement scheme, the predicted benefits of which will include reduced delays, a free- flowing road network and improved safety along this stretch of the A417.

The eastern end of the M4 exhibits relatively higher numbers of people either killed or seriously injured between Junctions 8/9 and 11 (Maidenhead to Reading) and on the mainline between Junctions 14 and 12 eastbound. The collision data is for the period 2015 to 2018, which pre-dates the completion of the all lane running smart motorway scheme on the M4 Junction 3 to Junction 12.

Severance was also highlighted by interested parties at the M4 in the Berkshire authorities (where between Swindon and Reading fatal or serious collisions involved walkers, cyclists and horse riders). The supporting Road Safety Foundation (RSF) data shows that on the route there is a relatively higher percentage of fatal or serious collisions on the M4 mainline between Junction 12 and 15 involving walkers, cyclists and horse riders.

The M32 in particular is identified as a location with safety and severance issues from interested parties. Supporting RSF data also indicates that on the route there is a relatively higher percentage of fatal or serious collisions on the M32 involving walkers, cyclists or horse riders. Severance was also highlighted by interested parties on the A417.

In relation to route performance, locations identified in the delay data, and which interested parties have mentioned as current points of congestion or mainline queueing are:

- Mainline queueing on the A417/A419 corridor
- A419 mainline to M4 Junction 15
- A404 Bisham Roundabout and the A404
- M32

Overall, the route performs relatively well however sections of the route notable for both average morning peak period delay and unexpected delay (reliability) include the A417, the M32 in Bristol, the A308(M) and the A404(M)/A404.

Our network considerations

- Safety on the M4, in particular Junctions 10 to 11 and west of 12 around Reading and between Reading and Junction 4B with the M25
- Safety on the M32 for all road users, in particular walkers, cyclists and horse riders
- Safety and performance of the A417 either side of the Air Balloon Roundabout where it meets the A436
- 2031 forecast performance in the morning peak on the A308(M), A404 approaches to Bisham Roundabout, the M32

Outcomes

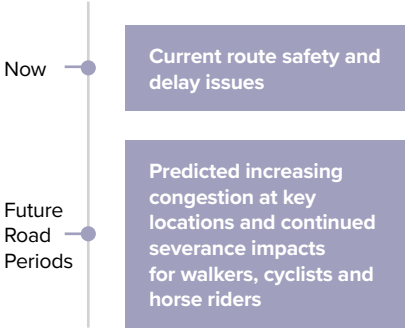
- Improved safety and reduced congestion along the M4 corridor between Reading and London and on the M32 in Bristol
- Improved safety on the A417 through providing a consistent route standard for users

DfT's Strategic objectives

Improving safety for all

Network performance

Timeframe based on the issues and constraints identified



B. Strategic connectivity and access to key gateways

Objective

Promote strategic connectivity between England (M49, M4, M48, M5 and M32) and South Wales as well as facilitating efficient access to key gateways at Heathrow Airport, Port of Bristol and Bristol Airport.

Context

The M4 forms the major strategic link between London, the West Country and South Wales. It also provides connections to the key gateways of Heathrow Airport (the connecting links of which interested parties acknowledged as increasingly important given the Airport's role as a global hub), the Port of Bristol and Bristol Airport, and ports and airports in South Wales, including important sea connections with Ireland.

Traffic flows on the Severn Bridges for access to Wales have increased following the removal of tolls in December 2018. This has increased the number of vehicles crossing the Prince of Wales bridge. Interested parties also highlighted congestion and resilience issues at the Almondsbury junction (Junction 20 of the M4). At this location, delay is present seasonally. The junction is a major interchange for strategic journeys and onward connections to the Midlands, the South West and South Wales.

The *review*[43] goes on to say that cross border journeys in South East Wales in the morning peak is 70% higher than those journeys made to other parts of Wales, highlighting the importance of the route in its function to connect areas and regions and providing for the movement of people and goods. Supporting National Traffic Information Service (NTIS) HGV flow percentage data shows that the Severn Crossings exhibit some of the higher heavy goods vehicle (HGV) percentages along the route with between 17% and 18% on the M48 crossing, and between 12% to 13% of flows on the M4 Prince of Wales Bridge crossing. This is comprised of HGVs and daily flows of around 5,000 HGVs in both directions using the M4 Prince of Wales Bridge.

Key gateways require good onward connectivity; within the route these include the Port of Bristol, Heathrow, Bristol and Cardiff Airports. In terms of international gateways, Heathrow is accessed directly from the M4 at Junction 4B using the M4 spur. The M5 and M49 are critical to access the Port of Bristol. Connectivity to Bristol Airport is principally via the M5 and the A38 and A370 (part of the MRN network) and therefore there are strong synergies with the Birmingham to Exeter route. Cardiff Airport is accessed off the M4 and A-roads to the south- west of Cardiff.

There are major economic aspirations for the Avonmouth and Severnside area around the Port of Bristol, which will see a considerable expansion of employment-led development. This includes logistics developments at the Avonmouth site which could increase traffic flows from the M49 and M4. Bristol Airport handles approximately 9 million passengers per year and serves as the principal airport for the West of England. There are aspirations to increase passengers at Bristol Airport. However, interested parties have raised connectivity and limited surface transport options, with the M5 and M32 as SRN links nearest to the airport.

Heathrow Airport is one of the busiest international airports in the world and an important local employer in the South East; as such, it is a major generator of both vehicle and freight traffic on the SRN. In 2019 (pre-Covid) the airport handled 80 million passengers which comprised almost a third of all UK airport passengers and also handles annual freight loads of approximately 1.5 million tonnes per year.

Interested parties highlighted the M4 from the M25 Junction 4B to Junction 13 being subject to congestion especially in peak periods. According to interested parties, the current highway standards and the reduced capacity of the motorway connections between the M4 and M3 result in compromised resilience of the MRN in relation the M25 South West quadrant (near to Heathrow Airport); there are aspirations to improve this part of the SRN. This impacts on the local road network and the already significantly congested M25 South West quadrant, particularly when there are incidents or motorway closures.

43 Sir Peter Hendy CBE, 2021, *Union Connectivity Review: Final Report,* https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1036027/union-connectivity-review-final-report.pdf

There are access strategies in place to increase the uptake of public transport to the airport and to reduce the level of car trips. It is noted the Western Rail Link proposals to connect Heathrow to the Great Western Mainline would improve rail connectivity to the west and provide additional public transport capacity. Heathrow has also been using freight consolidation centres which aim to reduce the number of HGVs to and from the airport.

Our network considerations

- Performance of the eastern section of the M4 between Reading and the M25 for onward access to Heathrow Airport
- Existing access to the Port of Bristol via the SRN, in particular Junction 22 of the M4, M5 Junctions 18 and 19, and the M49. This will be supported by the new M49 Junction 1
- Connectivity to South Wales via the M4 and M48. In particular, congestion and delay (seasonal) as well as unexpected delay (reliability) on the M4 west of Junction 19 through Junction 20 at the Almondsbury Interchange for onward connectivity to and from Wales via the Severn Crossings

Outcomes

- Reduced delays and more reliable and efficient connections between England and Wales
- Supporting national and regional economies in England and Wales through reliable and efficient access to international gateways

DfT's Strategic objectives

Network performance

Growing the economy

Timeframe based on the issues and constraints identified

Now

Connectivity and access constraints to international gateways of ports and airports.

Future Road Periods

Ongoing connectivity constraints between key gateways to cater for increasing demand for international travel and trade

C. Support regionally significant and sustainable economic development in the Berkshire authorities, Swindon and Bristol

Objective

Support the delivery of regionally significant and sustainable economic development in the Berkshire authorities, Swindon and Bristol whilst maintaining the safe and effective operation of the network.

Context

The route links key economic centres of Bristol, Swindon and Reading with London and also provides strategic connectivity to local economies. Future development in these key economic centres will place greater demand on the SRN. These include clusters of development in proximity to the SRN such as the south of Reading around the M4, east and north of Swindon around the A419, the northern fringe of Bristol, Avonmouth and Severnside, and Gloucester and Cheltenham.Existing issues of congestion, local journeys and junction hopping occur and will be exacerbated by the growth in these locations.

In the Reading and Thames Valley area, over 40% of employment areas are in the top output growth sectors; IT, life sciences, health care, environment sectors and land-based services are driving growth.

Interested parties mentioned the expansion of the Thames Valley Science Park in Reading along with developments in Wokingham. Of note within the Wokingham *Local Plan Update*[44] are aspirations for residential sites south of the M4 Junction 11 and at Hall Farm and Loddon Valley garden village east of Shinfield adjacent to the SRN.

The Green Park development site adjacent to the M4 Junction 11 in Reading is identified as a core employment area in the Reading Borough Local Plan and comprises business park uses and up to 700 houses. This will be accompanied by the Green Park Station and Interchange on the Reading and Basingstoke line which is set to open later in 2022.

Within the Maidenhead *Borough Local Plan*[45] there is a desire to focus strategic growth within Maidenhead town centre and south west Maidenhead as part of the Maidenhead Growth Area in proximity to the M4, A404(M) and A308(M).

Swindon features a range of industries including advanced manufacturing and logistics. Developments mentioned by interested parties included a storage and distribution facility proposed in South Marston, Swindon around the A419.

Other regionally significant developments noted within the Swindon *Borough Local Plan*[46] include residential developments to the north of the town at Tadpole Farm and Kingsdown and the strategic Eastern Villages site to the east of the A419 which could accommodate up to 8,000 dwellings along with employment allocations at Wichelstowe adjacent to the M4 and at Commonhead west of the A419.

The Greater Bristol area is noted for its advanced manufacturing and aerospace industries, alongside strong research and academic centres. Interested parties mentioned the Bristol Temple Quarter Masterplan including the redevelopment of Temple Meads Railway Station, development in the north and south of Bristol and expansion of the Port of Bristol at Avonmouth.

The Filton area to the north of the city is a significant area of employment for aerospace and engineering near the M4/M5 Almondsbury Interchange. This includes the Filton Enterprise Area earmarked for future employment land within the *South Gloucestershire Council Employment Land Review*[47] and will also be the proposed location of the Bristol Arena development.

44 Wokingham Borough Council, 2022, *Wokingham Local Plan Update: Revised Growth Strategy Consultation, November 2021 to January 2022,* https://www.wokingham.gov.uk/planning-policy/planning-policy-information/local-plan-update/#:~:text=Latest%20news,to%20everyone%20who%20got%20involved.

45 Maidenhead Borough Council, 2022, *Maidenhead Borough Local Plan, Policies Map 1,* https://www.rbwm.gov.uk/home/planning-and-building-control/planning-policy/development-plan/adopted-local-plan

46 Swindon Borough Council, 2015, *Swindon Borough Local Plan 2026 Swindon: Planning for our future,* https://www.swindon.gov.uk/downloads/file/3988/swindon_borough_local_plan_2026

47 South Gloucestershire Council, 2022, *Employment Land Review, Core Report,* https://beta-edit.southglos.gov.uk/wp-content/uploads/1.-SGC-ELR-Core-Report.pdf

In Cheltenham, emerging cyber specialisms alongside distribution and manufacturing services are the focus of future growth. Developments mentioned by interested parties in this area included the Golden Valley development in the west of Cheltenham. This will comprise 200 hectares of employment and residential use, the first phase of which will include the nationally significant Cyber Central development.

Our network considerations

- Interested parties, backed up by supporting data, indicated areas of congestion in proximity to the above development areas at Swindon on the A419 corridor, in particular southbound morning peak period delay and queueing on approch to M4 Junction 15. Development growth along the A419 corridor in the east of Swindon may further impact upon network performance
- Based on interested parties' feedback, 'junction hopping' occurs at a number of locations along the route, including around Reading and Wokingham as well as Gloucester. This puts additional pressure on the SRN and impacts strategic freight journeys
- Interested parties also mentioned that the stretch of the M4 between Junction 4B with the M25 and Junction 13, including around Reading, is subject to congestion particularly at peak times
- Supporting data indicates the SRN in the vicinity of Bristol such as the M4 between Junctions 19 to 20 and the M32 suffer from delay
- Supporting data also shows average morning peak period delay and seasonal delay as well as non-recurrent delay on the A308(M) and the A404(M) near to potential strategic growth in the Maidenhead area. Route performance is projected to decline in the future with additional morning peak delays on the A308(M) and the A404

Outcomes

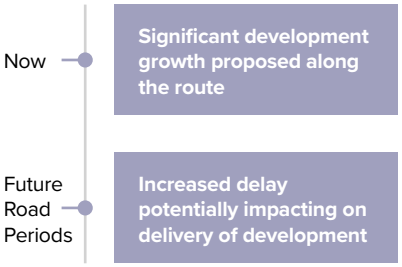
- Growth supported to unlock opportunities for local housing and employment development
- Coordination with local authorities to enable safe and efficient access to strategic sites by all modes of transport

DfT's Strategic objectives

Network performance

Growing the economy

Timeframe based on the issues and constraints identified



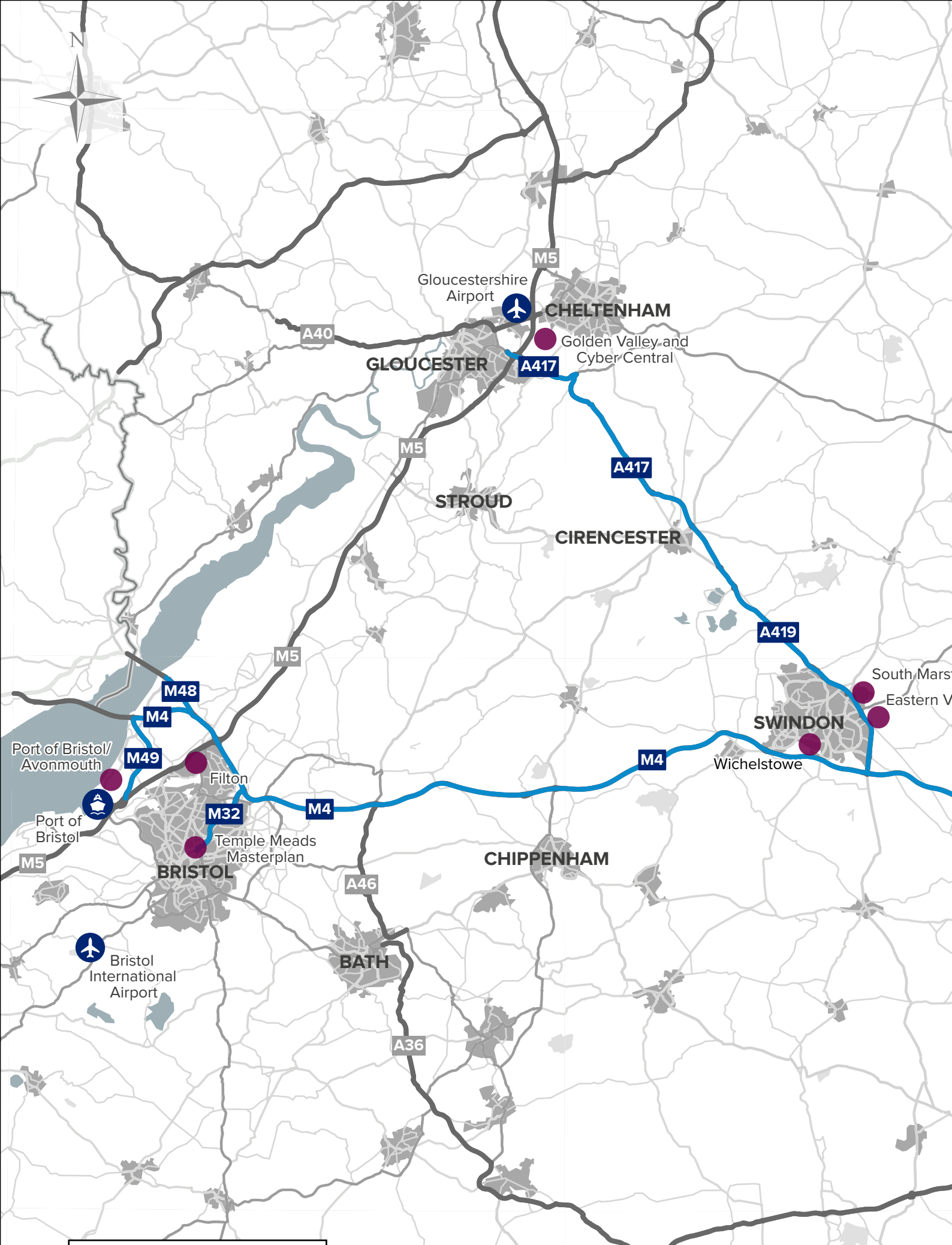


Figure 22: Regionally significant developments

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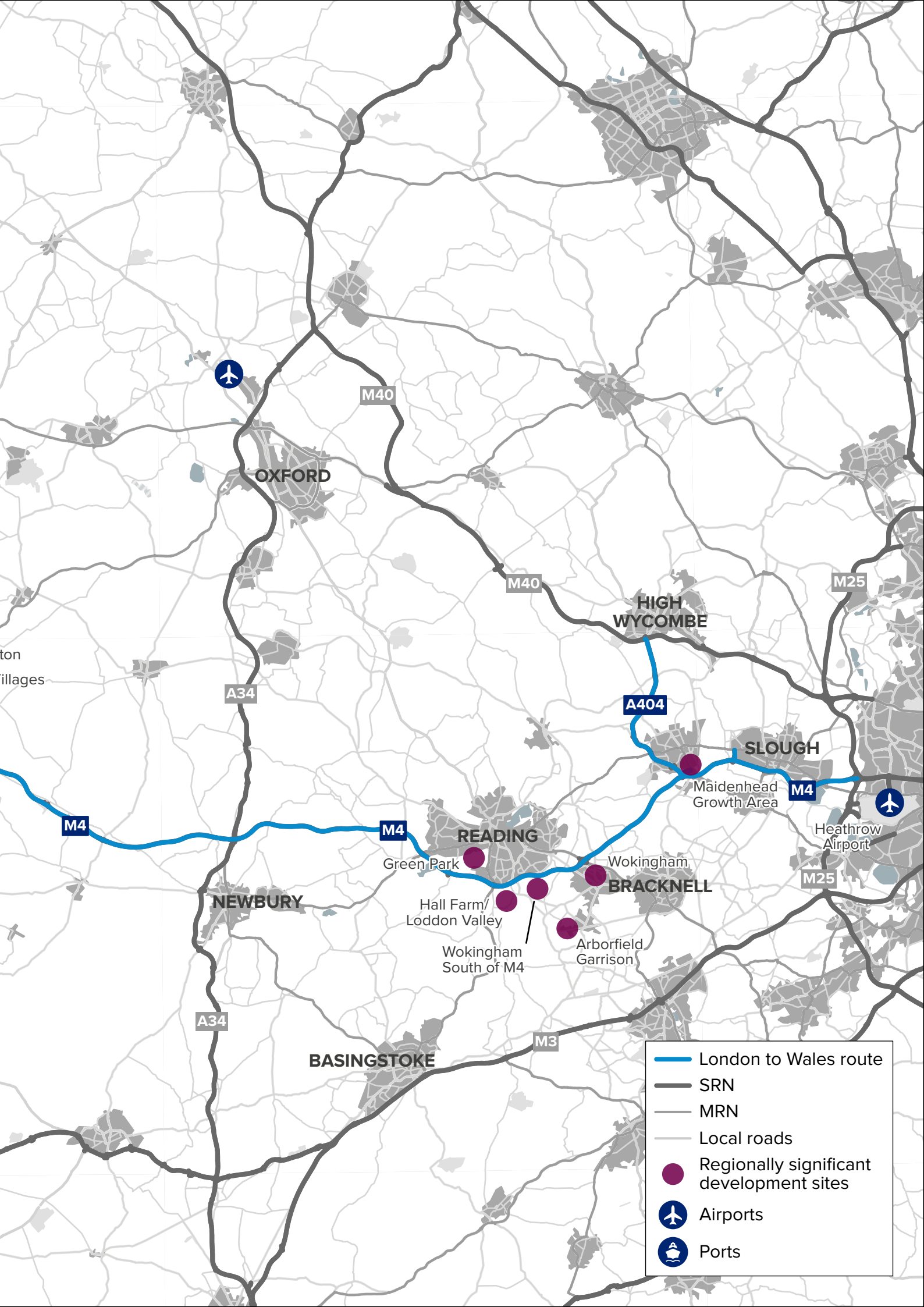

M40
OXFORD
M40
HIGH WYCOMBE
M25
A34
A404
SLOUGH
Maidenhead Growth Area
M4
M4
M4
READING
Green Park
Heathrow Airport
M25
Wokingham
BRACKNELL
NEWBURY
Hall Farm/ Loddon Valley
Wokingham South of M4
Arborfield Garrison
A34
M3
BASINGSTOKE
London to Wales route
SRN
MRN
Local roads
Regionally significant development sites
Airports
Ports

D. Support local connections and integration

Objective

Support effective local connections and integration with other transport modes to reduce short-distance travel demands on the SRN and promote the transfer to alternative modes of transport and reduce carbon particularly in the Berkshire authorities, Bristol and Swindon.

Context

The M4 serves as the principal route through the Reading and Thames Valley area and is served by numerous junctions. Where the M4 passes by urban areas, many junctions suffer from poor journey time reliability, in particular from Junction 12 at Theale to the M25.

The M4 serves a dual use at Reading; both for local traffic wanting to access local employment sites and strategic traffic. The alignment of the M4 and the location of employment on the edge of the town encourages junction hopping. To the south of Reading, Junction 11 of the M4 provides access to residential areas and employment sites such as Reading International Business Park, Green Park, Thames Valley Science Park and business parks along the A33.

Interested parties identified a need for improved public transport and active travel connectivity to Reading, as well as wayfinding for its park and ride facilities. They noted a desire for better electric vehicle charging facilities and shift in modes of transport to improve air quality and prompt active travel. They also mentioned the interaction of motor vehicles and other modes between Reading and the M4 such as Junction 12, which suffers from limited connectivity across the SRN for active travel users. It was also identified that Reading Green Park rail station is due to open in 2022. This will help serve existing and future land uses for Green Park which is designated as a core employment area in the *Reading Borough Local Plan*.[48]

In the Bristol area, the M4 and M5 on the northern and western fringes of the city serve a ring road function for local trips. Interested parties mentioned congestion and resilience issues at the Almondsbury Interchange (M4 Junction 20) where the M4 and M5 meet. The supporting data shows seasonal delay as well as lower journey time reliability between Junctions 20 and 19 westbound. Interested parties also commented on the M32, which suffers from congestion due to inbound city centre traffic and poor resilience during incidents. Supporting data indicates that the M32 is particularly prone to poor journey time reliability and delays in the average morning peak period delay period.

There are aspirations to improve rail services in the Bristol area, particularly improving frequencies. Interested parties highlighted the opportunity for service uplifts from both MetroWest and rail at, and around, Bristol. It was also mentioned that the absence of a mass transit system encourages motor vehicle use and thereby impacts the road network. Interested parties also have ambitions for a greater proportion of public and sustainable transport on the M32, both by means of integration and provision. Options for a park and ride are being explored for example, along with aspirations for bus priority measures on the M32.

Two train stations are proposed as part of MetroWest Phase 2 to serve Henbury and North Filton in Bristol on the new Henbury Spur. This will provide access to developments taking place at the former Filton Airfield site including the proposed Bristol Arena.

Around Swindon, the A419 serves the north and east of the town and provides access to existing residential and employment sites including the Great Western Hospital, Commonhead and at South Marston. Interested parties highlighted A419 mainline queueing at junctions and also on the A419 approach to M4 Junction 15. Supporting data indicates the A419 around Swindon suffers from average morning peak period delay and seasonal delays. Future development to the east of Swindon either side of the A419 such as the Eastern Villages residential scheme is likely to magnify performance issues on the A419.

48 Reading Borough Council, 2019, *Reading Borough Local Plan*, https://images.reading.gov.uk/2019/12/Local_Plan_Adopted_November_2019.pdf

Our network considerations

- Opportunities exist to improve local connections for users to make the transition to active travel from private vehicles, sustainable travel and Rapid Transit options in Reading and Bristol alongside a desire for greater public electric vehicle charging facilities
- Interested parties highlighted that the stretch of the M4 between Junction 4B with the M25 and Junction 13, including around Reading, is subject to congestion particularly at peak times
- The performance of the Bristol motorway box used for short trips with delays on the M4, M5 and M32
- Congestion and delays on the A419 around the north and east of Swindon which is earmarked for strategic development which could worsen future performance
- Opportunity to improve air quality and noise levels with public transport and active travel interventions where receptors may be more likely to experience potential adverse air quality and noise impacts, including south of Reading (M4 Junctions 11 to 10 eastbound), the M4 (Junctions 19 to 20) westbound, the M32, and on the A419 to the east and north of Swindon

Outcomes

- Improved local connectivity and greater travel choice for users across a range of modes for shorter trips which are competitive against the private car to remove shorter distance journeys from the SRN
- Improved network resilience especially in urban areas which suffer from knock-on impacts during periods of disruption
- Greater use of public transport and reduced demand on the SRN to facilitate more sustainable journeys, particularly between the West of England and South Wales

DfT's Strategic objectives

- Network performance
- Growing the economy
- A Technology-enabled network

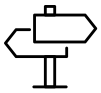
Timeframe based on the issues and constraints identified

Now

Current increasing urban expansion towards the route and reliance on car as the travel mode of choice, adding pressure to the network

Future Road Periods

Continued reliance on car trips for shorter, local journeys with associated negative impacts on the environment and network performance.



E. Support the needs of the freight sector

Objective

Support regional and national economies through the efficient movement of freight on the M4 and A417/A419, by enhancing lorry parking and driver facilities along with the transfer of freight to alternative modes, where appropriate.

Context

In the UK, a total of approximately 1.65 billion tonnes of freight are transported by all modes each year. The route is characterised by nationally important freight sites at either end. Heathrow Airport is located near to the eastern end of the route off the M25, and the Port of Bristol is accessed from the western end of the route along with onward connectivity to South Wales via the Severn Crossings. Swindon is located off the M4 at Junctions 15 and 16 and is notable for road reliant industries of manufacturing and logistics.

Supporting National Traffic Information Service (NTIS) HGV flow percentage data shows that the majority of the route has an HGV proportion of between 11% to 15% of daily traffic levels. The Severn Crossings have heavy goods vehicle proportions between 16% to 18% on the M48 crossing and between 12% to 13% of traffic on the M4 Prince of Wales Bridge. Daily there are approximately 5,000 HGVs travelling in both directions using the M4 Prince of Wales Bridge.

At the eastern end of the route approaching the M25 the percentage of HGVs is relatively modest at approximately 10% which reflects higher overall traffic flow on this part of the network, with around 6,000 to 7,000 HGVs travelling daily east of Junction 6 at Slough.

The route suffers from a low level of lorry parking, and suitable welfare facilities in particular, between Junction 13 at the A34 interchange and Membury Services. A 2017 *National Survey of Lorry Parking*[49] found that 24% of HGVs in the South East were parked off-site, either in laybys or industrial and retail estates and identified regionally high off-site parking around and on approach to the Port of Bristol. The report also predicts that utilisation levels in the South West and South East would be 'critical' by 2024.

The M4 is a strategic corridor connecting multiple economic centres, but also has connections with other freight corridors including the M5, M25, A34 and A417 which places additional freight demands on the route. Within the 2017 lorry parking report it was noted the following M4 lorry parks were identified to have critical levels of utilisation in 2017: Reading Westbound (120%), Chieveley (102%), Reading Eastbound (94%) and Leigh Delamere Westbound (85%).

The Great Western Main Line (GWML) broadly follows the alignment of the M4 and is heavily used by passengers for access between the West and London.

Recent investments in the line have increased both the capacity and capability on the network with more passenger services. The transfer of freight from road to rail along the GWML remains a strong aspiration for Network Rail.

Interested parties indicated that the A417 has few driver facilities prompting safety issues. Concerns have been expressed regarding the lack of abnormal load bays on the network and their booking, consequently rendering sections of the network unavailable to allow for mandatory driver rest periods. The A417 and A419 corridor was identified by interested parties as a significant freight route. Swindon has experienced, and will continue to see, growth in a number of sectors including advanced manufacturing and logistics which will generate additional freight traffic on the network.

Our network considerations

- The forecast 2031 morning peak delay (Figure 17) shows delay on sections of the route including between Swindon and Reading and on the M4 and M48 connecting to Wales
- Route reliability has been identified as an issue at locations of importance to freight movements, including the M4 mainline between Junctions 20 and 19 and approaches to the A417 Air Balloon Roundabout

49 Department for Transport, 2017, *National Survey of Lorry Parking* https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/723349/national-survey-of-lorry-parking-report.pdf

- The route is important for HGV access to Heathrow Airport, the Port of Bristol and for onward connectivity to Wales. There are high utilisation levels of lorry parking at motorway services on the M4 along with off-site HGV parking concerns noted in the South East and on the approach to the Port of Bristol
- The M4 corridor is served by existing motorway service areas with electric vehicle charging, but there is further potential to meet the future needs of alternative fuel vehicles and autonomous vehicles
- Interested parties noted a lack of driver facilities on the A417. Both the A417 and A419 feature lower levels of lorry parking and welfare facilities
- The potential growth at key freight sites such as the Port of Bristol and road reliant industries around the A419 in Swindon will potentially increase HGV traffic on the route and the demand for HGV parking and welfare facilities
- Network Rail has recommended additional capacity and improved capability for rail freight serving the Port of Bristol. It is also noted a transfer of freight from road to rail along the Great Western Mainline remains a Network Rail aspiration

Outcomes

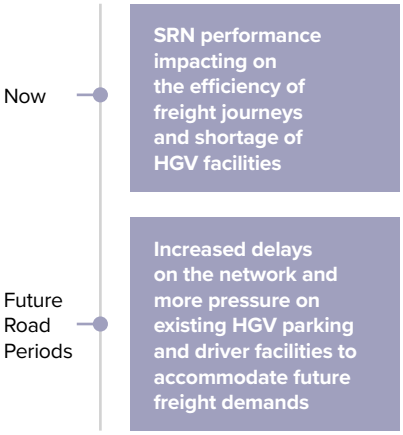
- Increased quantity and improved quality of HGV driver facilities, in particular on the A417 and A419
- Transfer of freight volumes by rail for longer distance trips and improved facilities for road-rail freight interchange
- Increased availability and uptake of alternative fuel sources around international gateways for freight vehicles

DfT's Strategic objectives

Network performance

Growing the economy

Timeframe based on the issues and constraints identified



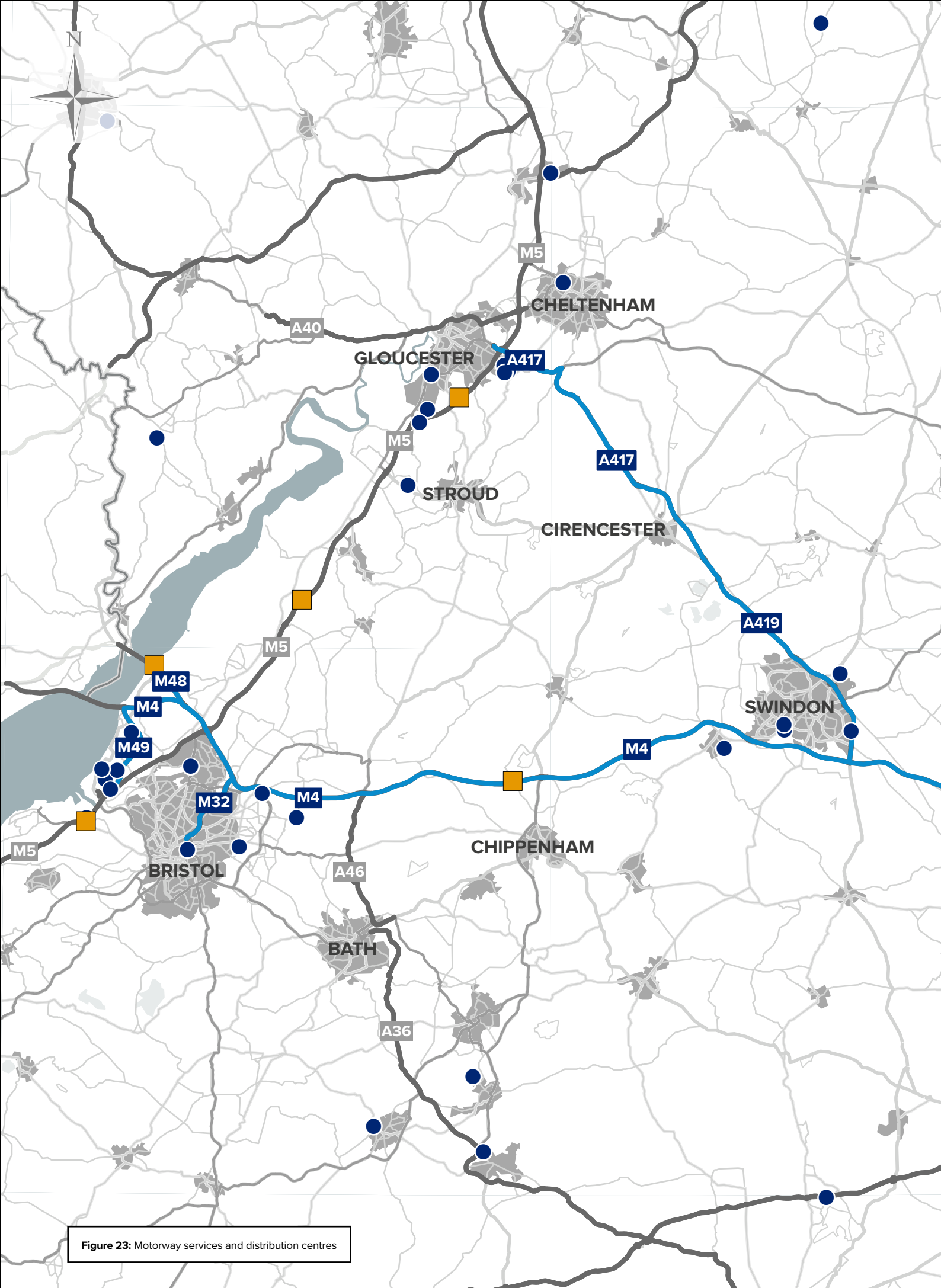


Figure 23: Motorway services and distribution centres

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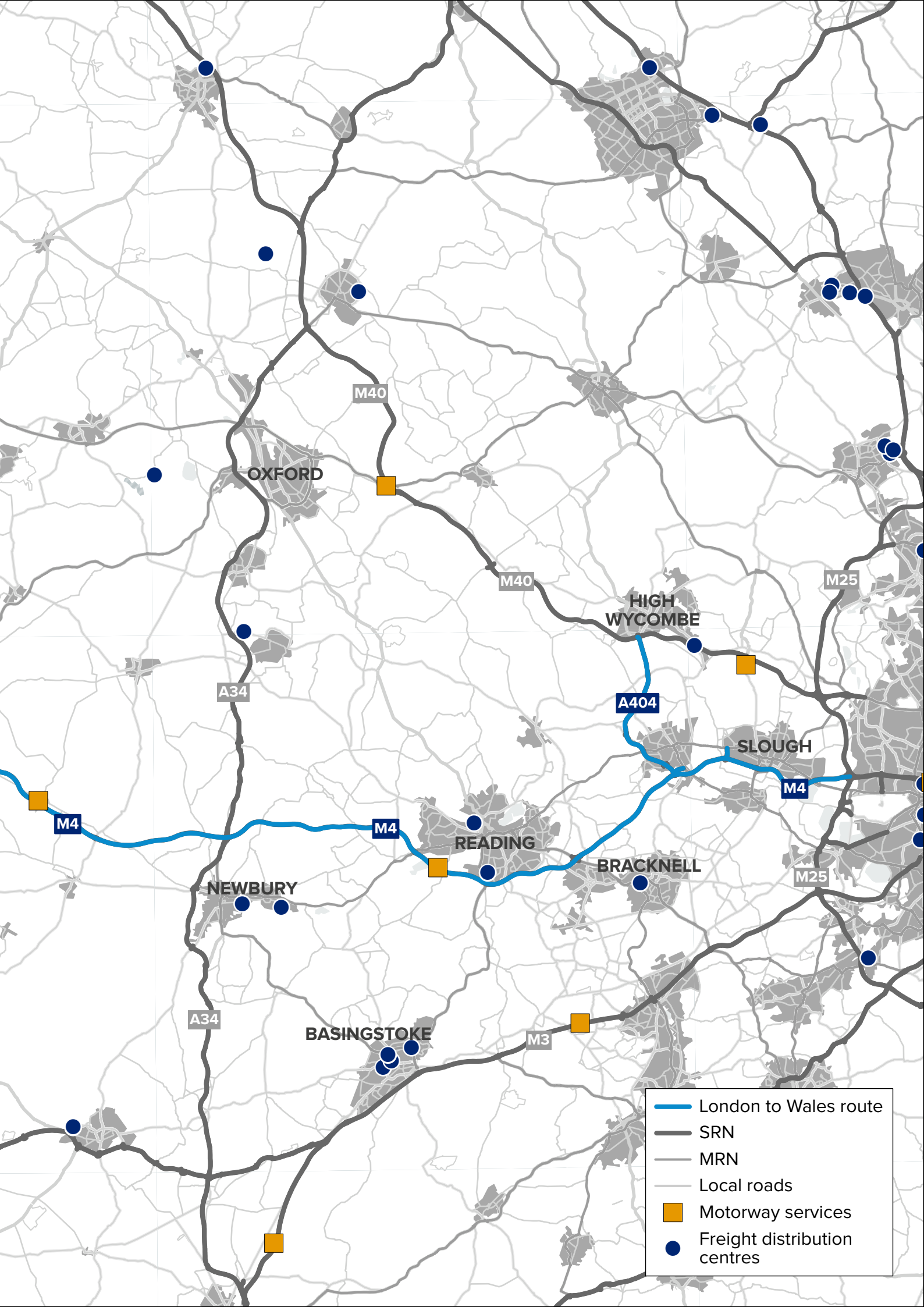
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A34
A404
SLOUGH
M4
M4
M4
READING
BRACKNELL
M25
NEWBURY
A34
BASINGSTOKE
M3
London to Wales route
SRN
MRN
Local roads
Motorway services
Freight distribution centres

F. Reduce adverse impacts on communities

Objective

To be a better neighbour by safeguarding the environment and reducing the impacts of severance, adverse air quality and noise on local communities along the M4 in Reading, the M4 and M32 in Bristol and the A417/ A419 in Swindon.

Context

The route passes through, or close to, a number of urban areas. Within these communities, the operation of the route has the potential to have adverse impacts in terms of air quality, noise and severance where roads create physical barriers preventing people accessing goods and services. These include Slough, Maidenhead and Reading in the Berkshire authorities, Swindon, the edge of Gloucester as well as northern and central Bristol. Interested parties raised the impacts of vehicles using the SRN upon local communities and highlighted the M32 and the M4 in the Berkshire authorities and the A419 in Swindon as locations of severance.

In the instance of the Berkshire authorities, it was raised by interested parties that the M4 is often used for short journeys as a result of severance.

The south of Reading in particular features a number of residential areas in proximity to the SRN at Junctions 10, 11 and 12 with potential residential development in the *Wokingham Local Plan Update*[50] around the SRN south of the M4 Junction 11 and at the Hall Farm and Loddon Valley garden village east of Shinfield.

The *Swindon Borough Local Plan*[51] includes aspirations for residential developments to the north of the town at Tadpole Farm and Kingsdown and the strategic Eastern Villages site to the east of the A419 which could accommodate up to 8,000 dwellings along with employment allocations at Wichelstowe adjacent to the M4 and at Commonhead west of the A419. This has the potential to intensify trip attractions either side of the A419 and increase the level of demand from walkers across the A419.

Within Bristol, the M32 passes through the north of the city with residential communities on either side of the SRN. This is shown in the supporting data from the Road Safety Foundation on the percentage of collisions including fatal and serious injuries to walkers, cyclists and horse riders where on the route, the M32 shows a greater proportion of these collisions.
The route also has ecological, cultural and environmental sensitivities. Some of the route passes next to or through, a number of Areas of Outstanding Natural Beauty including the North Wessex Downs, the Cotswolds and the Chilterns (Areas of Outstanding Natural Beauty), and nearby culturally significant sites such as Windsor Castle.

We recognise that vehicle emissions and noise from vehicles on our roads has the potential to adversely impact and can affect both the wellbeing and health of people living nearby. Whilst the transition to new and alternative fuel vehicles is expected to contribute to improved air quality in the longer term, National Highways has an important responsibility to respect the wellbeing of everyone who lives or works near the route. Air Quality Management Areas (AQMA) feature on the M4 between Junctions 5 to 7 at Slough, between Junctions 8/9 to 12 at Reading and at the Air Balloon Roundabout on the A417. Other sections of the route subject to AQMAs include the M4 at Bray and the M32 in Bristol south of Junction 1.

A number of urban areas near the route are subject to AQMAs such as Bristol, Bath, Reading and Maidenhead. A Clean Air Zone is set to be introduced in Bristol. Interested parties mentioned environmental impacts at, and around, High Wycombe as well as its air quality issues in relation to the impact of the SRN on the immediate environment. Supporting data indicates receptors at the following locations on the route may be more sensitive to high noise levels as these receptors are within 300 metres of the SRN:

- M32 (southbound)
- M4 (Junctions 19 to 20 westbound)
- M4 (Junction 19 to 18 westbound)

50 Wokingham Borough Council, 2022, *Wokingham Local Plan Update: Revised Growth Strategy Consultation, November 2021 to January 2022* https://www.wokingham.gov.uk/planning-policy/planning-policy-information/local-plan-update/#:~:text=Latest%20news,to%20everyone%20who%20got%20involved.

51 Swindon Borough Council, 2015, *Swindon Borough Local Plan 2026 Swindon: Planning for our future,* https://www.swindon.gov.uk/downloads/file/3988/swindon_borough_local_plan_2026

- A419 (Junction 15 of M4 to Junction at Stratton northbound)
- A419 (Junction with A4311 to Junction at Cricklade northbound)
- A419 (Mainline from Junction at Cricklade to Broad Blunsdon southbound)
- M4 (Junctions 11 to 10)
- M4 (Junction 7 to Holyport Interchange (Junction 8/9) westbound)
- M4 (Junction 7 to A4)
- M4 (Junctions 6 to 5 eastbound)
- M4 (immediately east of Junction 5)

Noise Important Areas (NIAs) for roads are based upon the Department for Environment, Food and Rural Affairs (DEFRA) strategic noise maps results and have been produced in line with the requirements set out in the noise action plans. NIAs within the route include:

- A404 at Maidenhead
- M4 at Holyport
- M4 at Slough
- M4 south of Reading
- A419 Swindon
- M32 Bristol

Supporting data indicates that receptors at the following locations on the route fall within 100 metres of the SRN and may be more likely to experience adverse air quality impacts:

- M32 (mainline between Junctions 1 to 3)
- M4 (Junctions 19 to 20 westbound)
- A419 (Commonhead roundabout to A4311 Junction northbound)
- A419 (Junction at Cricklade to B4019 Junction southbound)
- M4 (Junctions 11 to 10 eastbound)
- A404 (M) (Holyport Interchange (Junction 8/9) to A4)
- M4 (Junction 7 to 6) eastbound

Our network considerations

- Several sections of the route have nearby receptors which may be more likely to experience adverse air quality and noise impacts, particularly Noise Important Areas (NIA) which include south of Slough, Holyport and Maidenhead, between Reading and Wokingham and South Reading. AQMAs include: M4 between Junctions 5 to 7 at Slough, between M4 Junctions 8/9 to 12 at Reading, the Air Balloon Roundabout on the A417 and the M32 in Bristol south of Junction 1
- Severance created by the M4 and limited crossings of the road for vulnerable road users to the south of Reading where a number of residential areas are located adjacent to the M4. Demand for safe and suitable crossings will increase with future residential development either side of the M4 around Reading
- Urban expansion along the A419 corridor near Swindon will likely increase traffic volumes and crossing demand of the A419 in particular the regionally significant Eastern Villages scheme on the eastern side of the A419
- The M32 linking the M4 to Central Bristol runs through or close to urban communities and causes severance impacts in the area and is noted for collisions involving walkers, cyclists and horse riders.

Outcomes

- Improvement in the quality of life for communities located along the SRN
- Improvements in air quality and reduce adverse noise impacts
- Reducing SRN related severance of local communities to enable improved access to goods and services

DfT's Strategic objectives

Improving safety for all

Improved environmental outcomes

Timeframe based on the issues and constraints identified

Now

Current air quality, noise and severance concerns on the route

Future Road Periods

Continuing environmental issues due to traffic growth and urban expansion towards the route

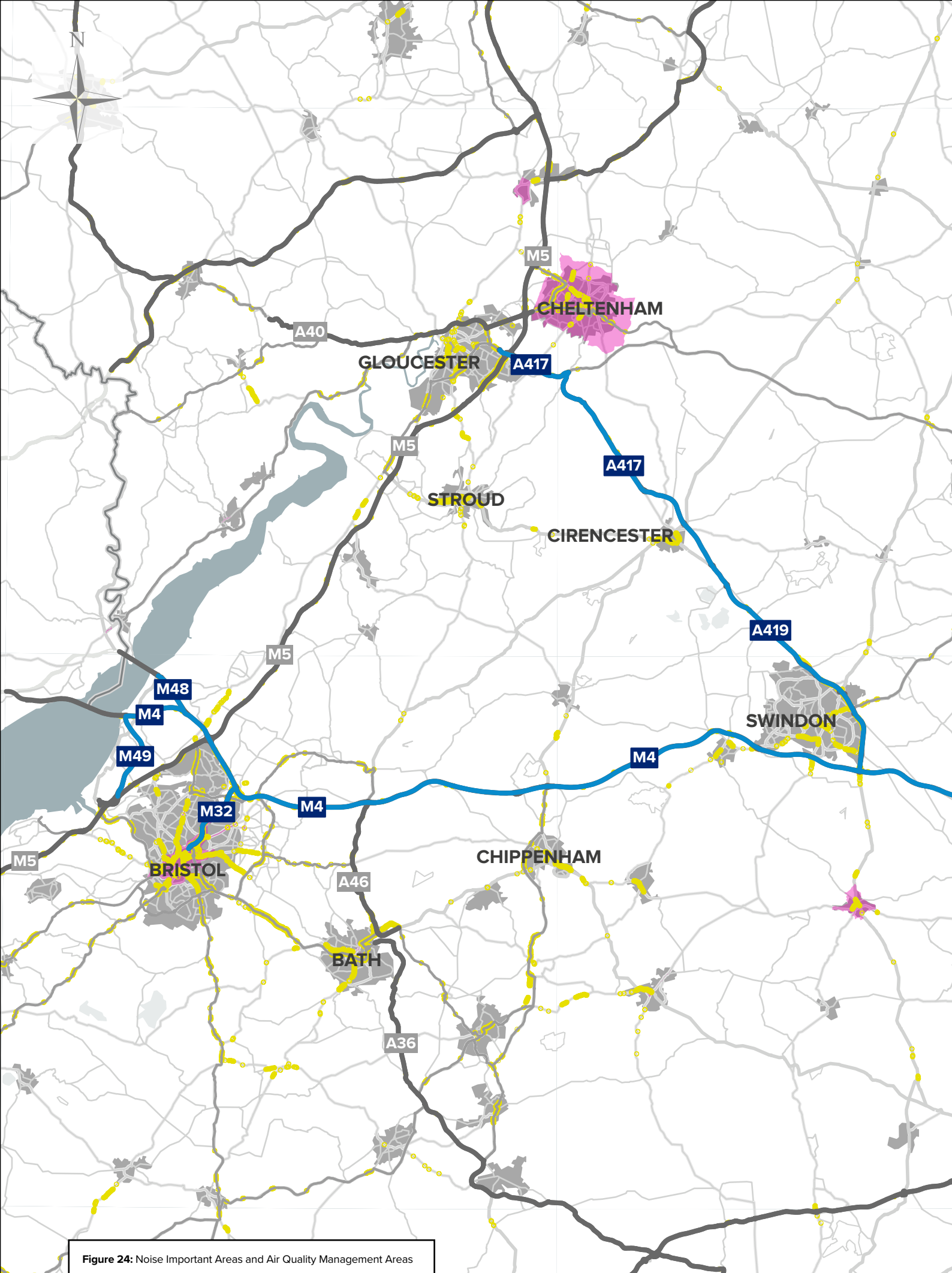

Figure 24: Noise Important Areas and Air Quality Management Areas

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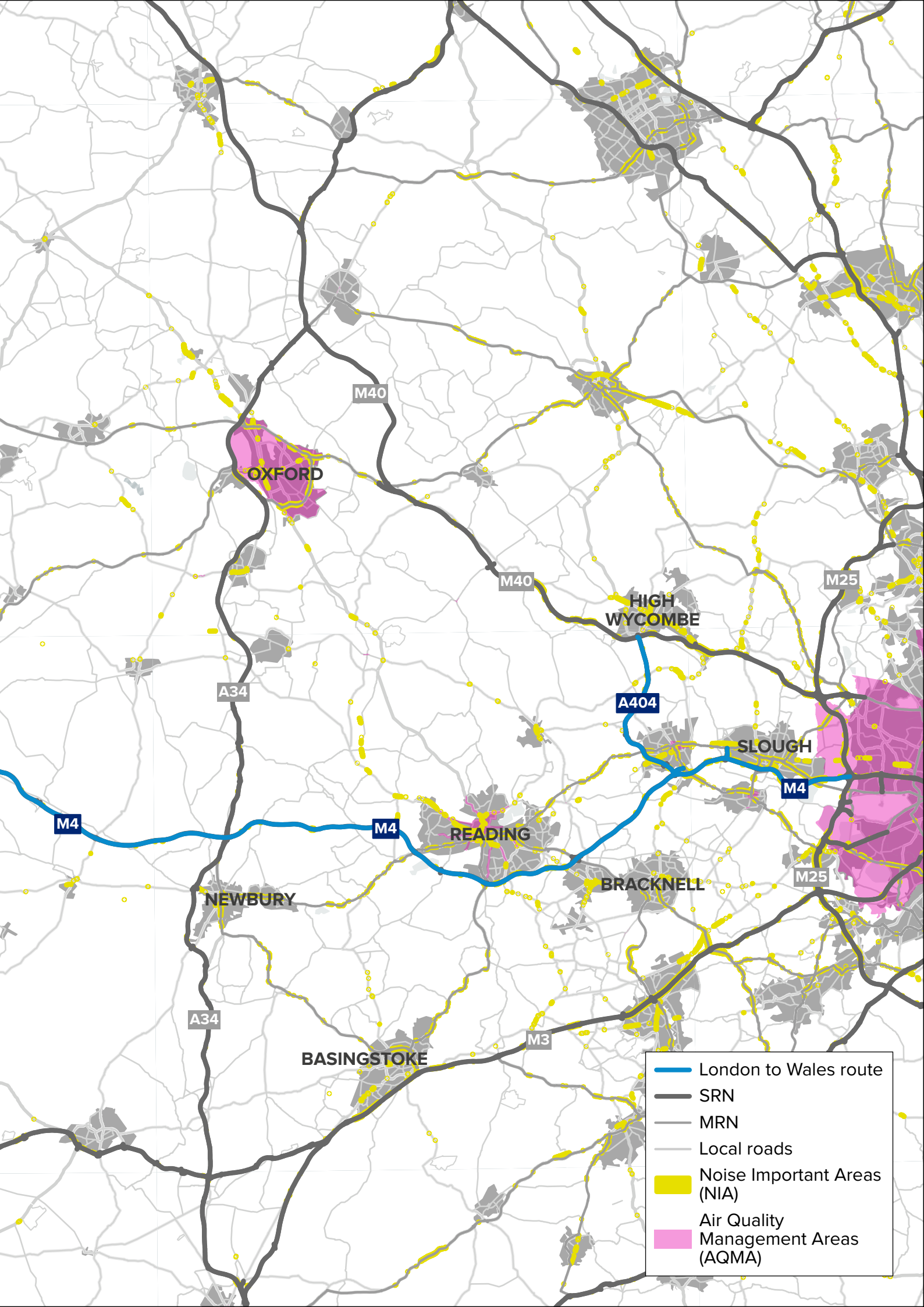
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M4
READING
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BRACKNELL
NEWBURY
A34
M3
BASINGSTOKE
London to Wales route
SRN
MRN
Local roads
Noise Important Areas (NIA)
Air Quality Management Areas (AQMA)

Table 2: Evidence used to inform objectives

Objective		Extent	Chapter 3 Views raised by our customers and neighbours	Chapter 4 Integration with our partners' strategies and priorities	Chapter 5 Challenges and issues identified
A	**Safe and reliable journeys** Provide safe and reliable journeys through provision of a resilient and consistent route particularly on the M4, in the Berkshire authorities, Bristol and the A417.	M4 at Reading, Swindon, M32, A417.	Interested parties noted that the M32 has safety and severance issues. On the A417 there are safety concerns on the A436 adjoining the Air Balloon Roundabout, and few driver welfare facilities on the A417. Severance is also noted on the A419 and the M4 in Berkshire. They also noted a need to improve traffic flow at the Almondsbury interchange (M4 Junction 20). Congestion or mainline queueing was mentioned by interested parties at the A417/ A419, the M4, A404/A404(M) and the M32.	Transport for the South East (TfSE) priorities are for more reliable journeys for people and goods on a more resilient transport network.	Congestion issues noted at the following locations: • mainline queueing on the A417/A419 corridor • M4 Junctions 4B to 13 between London and Reading Safety issues of KSIs noted at: • A417 Air Balloon Roundabout • A419 at Swindon • M4 Safety issues of collisions involving walkers, cyclists and horse riders: • M32 • A417 • A404 • M4 mainline between Swindon and Reading and between 10 and 4B with the M25, including the Huntercombe Spur at Junction 7
B	**Strategic connectivity and access to key gateways** Promote strategic connectivity between England (M49, M4, M48, M5 and M32) and South Wales as well as facilitating efficient access to key gateways at Heathrow Airport, Port of Bristol and Bristol Airport.	M4 around Bristol and London	Interested parties identified the Port of Bristol as a key gateway and noted its limited connectivity (Portbury and Avonmouth) from the M5. The interested parties noted the increased importance of links to Heathrow as a global hub. Avonmouth in particular could see further growth and expansion. Bristol Airport was stated as having limited connectivity in both infrastructure and transport options.	A key objective of the Western Gateway STP is to enhance business connectivity to international markets. A priority of England's Economic Heartland is to maintain the needs of the logistics and freight sector. Priorities of the TfSE Transport Strategy include better connectivity between major economic hubs and international gateways and more reliable journeys for people and goods	Key issues and challenges noted were: • Future expansion of the Port of Bristol and access off the M5 J18 and J19 • Network performance around Bristol such as M4 Junction 20 at the Almondsbury Interchange for onward Union Connectivity to Wales

Objective		Extent	Chapter 3 Views raised by our customers and neighbours	Chapter 4 Integration with our partners' strategies and priorities	Chapter 5 Challenges and issues identified
C	**Support regionally significant and sustainable economic development in the Berkshire authorities, Swindon and Bristol** Support the delivery of regionally significant and sustainable economic development in the Berkshire authorities, Swindon and Bristol whilst maintaining the safe and effective operation of the network.	M4 at the Thames Valley, Swindon and Bristol, A419, A404(M) and A308(M)	Interested parties noted the following regionally significant developments on the route: Developments east of Swindon around A419 including a major storage and distribution facility proposed at South Marston, Swindon. Development proposals in the north and south of Bristol and urban intensification in the city centre. It was also commented that the A417 Missing Link scheme is economy-led, and east-west journey demand may increase. Furthermore, Wokingham development and the associated journeys on the M4, or crossing the M4 to Reading, was mentioned, as well as the expansion of the Thames Valley Science Park.	Key objectives from the Western Gateway Strategic Transport Plan (STP) include ensuring effective access to labour markets and greater integration of employment clusters. Priorities of England's Economic Heartland include maintaining the needs of the logistics and freight sector whilst lowering the environmental impact. TfSE priorities are for more reliable journeys for people and goods and a more resilient transport network.	Challenges and issues identified include: • Performance issues on the A417/A419, which is important for connectivity to the Midlands. • Future developments around the east of Swindon will increase performance issues on the A419. • Existing performance of the M4 around Reading. This area is notable for a number of growth sites around the SRN including Green Park and Thames Valley Science Park. • Network performance around Bristol such as M32 and M4 Junction 20.
D	**Support local connections and integration** Support effective local connections and integration with other transport modes to reduce short-distance travel demands on the SRN and promote the transfer to alternative modes of transport and reduce carbon particularly in the Berkshire authorities, Bristol and Swindon	M4 at the Thames Valley, Swindon and Bristol	Interested parties told us about: A need for active travel and public transport promotion, including of links to Reading. Limited highway and public transport connectivity to Bristol Airport. Limited connectivity across the SRN for active travel users around Reading Upcoming rail developments around Reading in proximity to the M4 including a new station at Green Park and potential Park and Ride at Theale Station. Metrowest proposals for rail services in Bristol.	Priorities of the TfSE Transport Strategy include a reduction in consumption of resources and energy used by transport and affordable and accessible transport Integrated transport network.	Challenges and issues noted include: • Use of SRN for local journeys including M4 around, and M32 in, Bristol, A419 in Swindon and M4 around Reading. • Ambitions and priorities for modal shift to Active Travel, sustainable travel and Rapid Transit options in Reading and Bristol. • Improving Park and Ride rail integration.

Objective		Extent	Chapter 3 Views raised by our customers and neighbours	Chapter 4 Integration with our partners' strategies and priorities	Chapter 5 Challenges and issues identified
E	**Support the needs of the freight sector** Support regional and national economies through the efficient movement of freight on the M4 and A417/A419, by enhancing lorry parking and driver facilities along with the transfer of freight to alternative modes, where appropriate	M4 route and A417 / A419	Interested parties told us about regionally significant developments on the A417 and A419 particularly around Swindon. Existing issues were also noted with the A417 Air Balloon Roundabout and a lack of driver facilities.	A priority for England's Economic Heartland includes maintaining the needs of the logistics and freight sector. The DfT 2017 Lorry Park Survey identified utilisation levels in the South West and South East would be 'critical' (85% or over) by 2024.	Challenges and issues noted include: The strategic nature of M4 as an important freight corridor with nationally important sites at both ends and onward connectivity to Wales. Presence of road reliant industries such as storage and distribution at Heathrow and Bristol along with developments of similar nature around Swindon. Lack of services and driver welfare facilities.
F	**Reduce adverse impacts on communities** To be a better neighbour by safeguarding the environment and reducing the impacts of severance, adverse air quality and noise on local communities along the M4 in Reading, the M4 and M32 in Bristol and the A417/A419 in Swindon	M4 at the Thames Valley, Swindon and Bristol. A419 and A404.	Interested parties noted the limited number of crossing points across the M4 and a desire to reduce the severance impact of the M4. Safety and severance issues were identified on the M32 in Bristol which bisects the community, making it difficult for local residents to get around their own area. It is also identified as a potential location for air quality and noise issues. Interested parties also told us the A417 causes significant noise to local communities, as well as near the M5 Junction 11a. The interested parties also mentioned potential air quality issues in proximity to the SRN at High Wycombe.	Decarbonisation features as a theme across all three Sub-national Transport Bodies along the route. One of the social, economic, environmental priorities of the TfSE Transport Strategy is for improved air quality. Modal transfer of freight from road to rail remains a strong aspiration for Network Rail in view of the Great Western Main Line's electrification.	Noise Important Areas (NIA) include south of Slough, Holyport/Maidenhead, between Reading and Wokingham and South Reading. Air Quality Management Areas (AQMA) along the route including at Bray, in close proximity to Junction 8/9 of the M4 and the A404(M)/A308 (M). Other sections of the M4 subject to an AQMA include Junctions 8/9 to 12 south of Reading, Junctions 5 to 7 south of Slough and the M32 corridor on approach to Bristol, the Air Balloon roundabout, as well as the A404 Junction with the M40. There are receptors in other locations in proximity to the SRN that may be more likely to experience adverse noise and air quality impacts from traffic on the SRN. Perceived severance along the M4 in Reading, the M4 and M32 in Bristol and the A417/ A419 in Swindon.


M 5 (N) The MIDLANDS
Gloucester
M 5 (S)
The S. WEST
Bristol (W) &

Unlocking regional potential

07 Locational areas for consideration and potential collaboration

We know the importance that investment in our network can make locally, regionally and nationally. It can make areas more attractive for inward investment, unlock new sites for employment and housing, and facilitate regeneration. It can also ease congestion, improve our customers' journeys and support environmental improvements.

In this chapter, we outline our proposed locational areas for further consideration, which will be explored in future road periods to achieve the London to Wales route objectives and the Department for Transport's (DfT) six strategic objectives. These do not represent a commitment as funding will be considered as part of the development of the third *Road investment strategy* (RIS) and other investment processes. Furthermore, they do not represent a final list of our potential investment locations and will be refined in our *final Route strategy overview report*, published alongside our RIS3 *Strategic business plan* and *Delivery plan 2025-2030*.

Alignment with government objectives

Route strategies are aligned to the DfT's six strategic objectives and will also contribute to the RIS3 performance metrics set as part of the RIS-setting process.

Improving safety for all

Safety is our top priority and we are committed in the second road period to reducing the number of road users killed or seriously injured on the Strategic Road Network (SRN), by 50% (from the 2005-2009 baseline) by the end of 2025, with a long term vision of zero harm. This includes our contractors adopting a Safe System approach to ensure roadworker safety. Our operational and strategic planning teams continue to work to prevent incidents from occurring and are focused on reducing incident severity through a package of activities promoting safer roads, safer people, safer vehicles and coordinated collision response. We are also learning from other organisations and interested parties about what works best and are collaborating with them to improve safety for all. Safety is embedded in our study programme to inform future investment priorities for RIS3 and beyond.

Network performance

Our operational and strategic planning teams continue to explore what steps can be taken to make journeys more reliable and not subject to delay, as well as safer, while protecting and respecting the environment. This involves working with our partners, such as Sub-national Transport Bodies and other operators including Network Rail, to consider interventions to improve network performance. We recognise the SRN does not stand alone from other transport infrastructure, in particular local roads, and users expect journeys to be seamless regardless of transport mode or ownership. Through our study programme we will identify appropriate types of intervention recognising the need for integration, environmental and digital consideration balanced against costs.

Improved environmental outcomes

We are continuously working to ensure our roads work more harmoniously with the communities that live alongside them and the environments that surround them. We embed environmental considerations into all our activities, ranging from managing and operating the network to infrastructure design, scheme delivery and ensuring we meet our wider statutory obligations. In developing our programmes, we will consider a broad range of interventions, including technology-enabled solutions and integration with other operators' networks, as we understand the gravity of the climate situation and are committed to playing our part in reducing carbon emissions. Our carbon policy commitments are:

- as a net zero Britain will still travel by road in 2050, we will ensure we can support a properly maintained, future- ready road network that is fitted to support the transition to electric vehicles, and is key to reducing emissions from transport
- this programmatic coordinated delivery approach will act as a catalyst for: production management, off-site construction, reducing network disruptions, unlocking economies of scale, and supporting delivery of net zero targets
- it will also help us understand how interventions should be delivered, either through grouping or as standalone projects
- we expect this approach will create opportunities for increased efficiency, and enable us to deliver more within our funding. We also expect this approach to help us support the Government's long-term aims for the nation, such as contributing to net zero carbon, and social values

Growing the economy

We recognise that the strategic road network (SRN) is a significant economic asset for the UK and is essential for people to access jobs, and for businesses to move goods around the country. Our regional planning teams continue to work closely with local planning authorities to support sustainable growth and development aspirations, including by trying to improve integration between transport modes. We also continue to work with businesses to understand their needs, such as quality lorry parking facilities and ensuring reliable and resilient integration with ports, airports and rail terminals to access global markets. The SRN also has a role in achieving the Government's moral, social and economic programme of levelling up the United Kingdom. Our forward intervention programme will seek to support the growth agenda where possible and appropriate.

Managing and planning the SRN for the future

We recognise that our network is complex and varied and requires careful stewardship to keep it in good condition. Our ongoing maintenance programme is essential to safety and keeping our roads open, while our renewals activity allows us to maintain, safeguard and modernise all our assets, and provide increased resilience in relation to extreme weather. Research and data help us to understand what our network needs over the short and long term, and to inform our planning. We continue to be committed to delivering our work in a way that minimises disruption to our customers and maximises value to taxpayers.

A technology-enabled network

In designing our intervention programmes, we will consider our Digital Roads vision for how we harness data, technology, and connectivity to improve the way the SRN is designed, built, operated and used for the future. This will enable safer journeys, faster delivery and an enhanced customer experience for all. The vision is structured around three themes: Design & Construction, Operations, and Customers. The approach embeds digital, data and technology across the intervention programmes, providing the building blocks for a digital future for roads.

Programmatic approach to investment

As part of our new route strategies process, we are developing a more programmatic approach to how we develop our investment plans. This will help us determine the complexity of potential investments and what high value interventions are more deliverable.

This programmatic coordinated delivery approach will act as a catalyst for; production management, off-site construction, reducing network disruptions, unlocking economies of scale and supporting delivery of Net Zero targets.

It will also help us understand how interventions should be delivered, either through grouping or as standalone projects.

We expect this approach will create opportunities for increased efficiency, enable us to deliver more within our funding and in collaboration with other investment programmes.

We also expect this approach to help us support the Government's long-term aims for the UK, such as contributing to net zero carbon.

Figure 25 shows how the route objectives defined in the route strategies, along with the associated cluster analysis of performance metrics, help to refine an initial set of locations for future investigation. Further iterations of sifting as information and analysis evolves will help to inform the Government's setting of RIS3 (2025-2030) and beyond. The input from route strategies early on in this process will ensure that all schemes which are ultimately taken forward align with the route objectives.

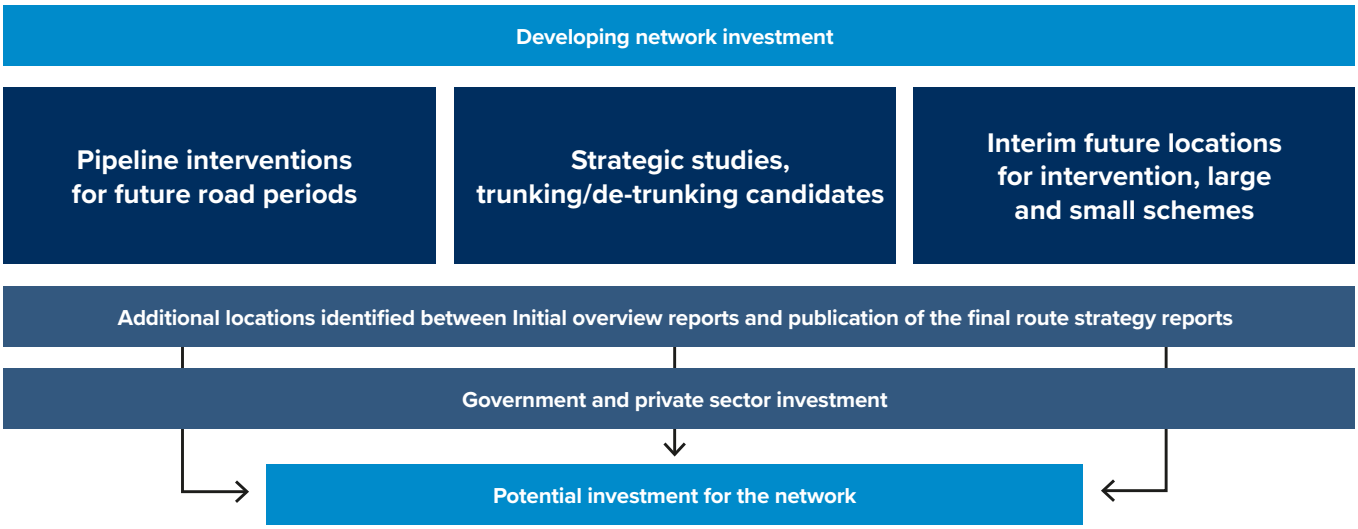

Figure 25: Process to identify potential investment on the network

Types of investment and funding sources

There are a variety of funding streams that enable us to invest in our network and that form part of our investment planning. These streams are summarised in the following section, along with the current committed schemes associated with each funding source for the London to Wales route. Potential funding sources include:

- RIS Funding – a funding stream administered by National Highways, set by the Government's publication of the RIS
    - RIS2 schemes are committed by DfT to be delivered as part of the Road investment strategy, as outlined in the following RIS2 table. The statement of funding confirmed that £24 billion will be provided during the second road period (2020-2025) to deliver this work, noting that some RIS2 commitments will continue into the third road period
    - RIS4 (2030-2035) pipeline schemes, previously earmarked for RIS3 (2025-2030), will continue to be developed in line with our statutory processes and considered for inclusion within RIS4. These are potential future schemes originally identified by National Highways and set as part of RIS2 by DfT. These schemes are not currently committed for construction.
- maintenance funding and asset renewal – within National Highways there is funding set aside for network maintenance and renewing ageing assets across the network. The budget for these is included in the RIS settlement
- potential targeted funding streams may be made available to National Highways during the third road period as part of the wider RIS settlement, focused on making improvements that will make the biggest difference and deliver lasting benefits
- other external sources of funding delivering infrastructure enhancements on, or close to, the SRN including Central government third parties, private sector developments, and inward investment

RIS2

The following schemes are committed for the second road period (2020-2025) on the London to Wales route:

Scheme number	Scheme	Description	Start of works	Open for traffic
Committed for the second road period (2020-2025)				
1	A417 The Missing Link	New dual carriageway connecting the existing A417 Brockworth bypass with the existing A417 dual carriageway south of Cowley.	2023/24 Q2[52]	Third road period (2025-2030)
2	M4 Junction 3 to Junction 12	Smart motorway (all lane running)	Started	Completed in 2022
3	M4 Junction 19 to Junction 20	Upgrade dynamic hard shoulder running to all lane running	Cancelled[53]	

RIS4 pipeline

The following uncommitted schemes are in the pipeline for consideration for inclusion in the fourth road period (2030-2035) on the London to Wales route:

Scheme number	Scheme	Description
1	Severn Resilience Package	Package of possible improvements to sections of the M4, M5 and M32 on the eastern side of the Severn Crossings near Bristol. This project is currently on hold pending review of the traffic flow impacts of removal of the Severn tolls.
2	A404 Bisham Junction	Study into the viability of providing either a grade separated junction or other options to alleviate current issues experienced at the junction.
3	A404/M40 Junction 4 High Wycombe	Study into the viability of providing a free flow connection from the M40 Eastbound to the A404 Southbound.

Other notable schemes

As for other notable schemes on the route, within the Western Gateway region, are the improvements at Junction 17 of the M4. This is a proposed upgrade of on and off slip roads on the M4 eastbound, circulatory signalisation and 3 narrow lanes on over-bridges.

This is a proposal being developed by Wiltshire council seeking funding from the DfT's major road network programme. The works are due to commence 2024-2025, and is expected to be open for traffic 2025-2026.

52 Date revised due to planning constraints and stakeholder input
53 Plans for new smart motorways have now been cancelled and previously paused smart motorways will now not go ahead.

Strategic studies, trunking and de-trunking

National Highways undertakes strategic studies to analyse complex problems that may need to be addressed over multiple road periods. Strategic studies often involve close working with key partners, including Sub-national Transport Bodies and DfT, and can be used to help to decide on whether to fund any proposed improvements in the future.

RIS2 includes a strategic study for the M4 to Dorset Coast. We expect that this study will identify which corridor provides the main strategic route for the area; may recommend the trunking and de-trunking of key routes; and may identify priority investments in the area that can be taken forward after the dualling of the A303/A358 is complete.

National Highways were asked to explore changes to the SRN to ensure the network aligns with the second Road Period strategic priorities reflected in the *Strategic business plan*[54]. This Plan relates to improving connections between main urban centres, to international gateways, to peripheral regions (for levelling up) and strategic cross-border routes (to strengthen union connectivity).

It included a commitment to explore potential asset ownership changes between ourselves and local highway authorities that could be implemented no earlier than the start of RIS3. DfT has produced a shortlist of 18 trunking and two de-trunking candidates, identified following the draft RIS2 public consultation in 2018, for us to assess desirability and viability of asset transfer. De-trunking is the process of returning a National Highways road to local highway authority control, and vice versa for trunking.

These candidates were put forward by a range of external stakeholders, including local authorities, Local Enterprise Partnerships and Chambers of Commerce, then shortlisted by DfT. There is ongoing work to review the assessment evidence and recommendations. By autumn 2022, government ministers are expected to announce which candidates will progress to the detailed development stage, which will be led by National Highways and incorporated in the forward study programme and wider RIS3 process.

Locations identified through route strategies for future investigation

National Highways undertakes route studies to investigate problems at identified locations across the network. In addition, locations of interest have been raised by interested parties through the route strategy engagement process.

To supplement this, as part of the route strategies process outlined in this document, National Highways has used cluster analysis to identify further locations for future investigation and undertaken an exercise to align these locations to the route objectives for the London to Wales route.

The cluster analysis allows decision makers to easily identify which sections of roads should be prioritised for further investigation. The assessment is a two-part process. In the first part, for each route strategy, the objectives are defined geospatially. This allows us to identify over which sections of the SRN the objectives converge, therefore quickly identifying the links that help us to achieve the maximum number of objectives. The second part of the assessment uses our understanding of the network from performance data to allow a further filter to remove links that are already performing well. This results in a filtered shortlist of SRN links or sections of roads that should be prioritised for further investigation.

These have been grouped into areas of interest where they are in close proximity geographically. Should a location not be identified for further investigation as part of this initial process, this does not preclude it from being added to the list of areas of interest in the future.

The use of regional traffic models for the 2031 scenario has helped identify locations for further investigation based on the forecast network operation in the future to plan the future of the network beyond the current RIS3 cycle. Typically, this has resulted in the extension of some areas of interest, as shown in the table of locations overleaf. In the final publication version of the Route strategy overview reports, additional data from the regional traffic models will also be considered to enable the identification of locations for further investigation in future roads periods.

54 Highways England, *Strategic business plan: 2020-2025*, https://nationalhighways.co.uk/strategic-business-plan/

Further development of any proposed mitigation at each location will follow National Highways' internal processes. In order to fund any proposed improvements, National Highways will draw on the funding streams as previously identified.

Route strategies and regional traffic models

The route strategies have utilised the National Highways regional traffic models (RTMs) to identify future performance and delay on the network, which is the best data currently available.

Working with key stakeholders and interested parties, we have set out a number of potential candidate intervention locations which may require further development upon validation to check their alignment with the route strategy objectives.

New national traffic growth forecasts have now been released by the Department for Transport and as we carry out this exercise, we will consider how updated growth forecasts will impact on the identified areas for further investigation.

Alongside these more traditional road improvement schemes we will also need to support and encourage modal shift through transport integration and embrace emerging technologies to improve the performance of the network.

The impact on carbon and the environment will be central to all our thinking on which interventions are proposed to be taken forward.

Identified locations for future investigation and collaboration

Our analysis has set out the potential constraints and opportunities across the network and, in parallel, we are developing a RIS programme that is resilient to changing priorities, and responsive to the environmental agenda.

We have a wide range of potential intervention types within our toolkit, including both non-road and road-based solutions, to help us achieve our objectives. These could include:

Potential non-road interventions:

- supporting wider network initiatives to improve the customer experience, such as provision and enhancements of facilities for the freight industry and electric vehicle charging
- exploiting technology to improve safety and network operation, including roll out of connected corridors
- delivering a portfolio of measures to encourage active travel
- making environmental enhancements to minimise the impact of the SRN on surrounding communities
- encourage modal integration and influencing demand for vehicles, particularly at interfaces with urban centres

Potential roads interventions:

- in addition to Lower Thames Crossing, we will continue to progress those remaining schemes in the RIS1 and RIS2[55] that will not be in construction at the end of RP2, as well as the RIS4 pipeline.
- the pipeline schemes announced in RIS2 is the most developed portfolio of potential interventions and we propose a renewed focus to ensure schemes: are resilient with an acceptable Value for Money; consider the Carbon Management in Infrastructure standard; are affordable, with lower cost options being developed; are environmentally responsible; are deliverable; and, have strong stakeholder support and / or are a good strategic fit with other government strategies e.g. ports, levelling up

55 Plans for new smart motorways have now been cancelled and previously paused smart motorways will now not go ahead.

We will also develop a significant portfolio of smaller safety and congestion interventions that improve localised issues as well as route treatments that address comparably poor safety performance (International Road Assessment Programme 1-star and 2-star roads) along selected all- purpose trunk road corridors.

Table 3 and Figure 25 below show the areas identified for further investigation, where interventions have the potential to help us achieve the majority of route objectives.

In line with National Highways' internal processes, we will draw upon a wide range of funding streams, further developing any proposed intervention to the issues identified, exploring:

- collaboration and integration opportunities
- synergies with existing planned schemes
- opportunities with asset and maintenance priorities as set out in Chapter 5.5

As part of the ongoing evolution of the route strategies toward final publication we will further strengthen its role in being a strategic planning tool for interested parties who have a stake in the SRN and its future.

Table 3: Areas of interest for further investigation

Area location	Area of interest	Area issues	Now	Future road periods
		M4		
M4 between Junction 4B (M25) and Junction 8/9	**A**	Relatively higher numbers of people **killed or seriously injured** on the mainline between Junctions 7 to 4B. Supporting RSF data also indicates that on the route there is a relatively higher percentage of fatal or serious **collisions** involving **walkers, cyclists and horse riders** on this section of the route. **Seasonal delay** is also noted between Junctions 4B and 12 of the M4. **Congestion** was highlighted as a problem by interested parties, particularly at peak times. Supporting National Traffic Information Service (NTIS) HGV flow percentage data shows that on the route, east of Junction 6 there are higher levels of **HGV traffic** at approximately 10%. There are also **development** aspirations for strategic growth in and around Maidenhead. Receptors may be sensitive to **noise** and **air quality** issues adjacent to the M4 mainline Junctions 7 to 6. Lower **air quality** is also a potential issue on the mainline from Junction 7 to where it meets the A4 and from Junction 6 to 5 eastbound. There is an **AQMA** in place along the route (M4 Junctions 5 to 7) as well as an **NIA** next to Slough (Junction 6). Furthermore, around Bray the route is considered to be at risk of **surface water flooding**.	✓	✓
M4 Junction 7 to Huntercombe Spur	**B**	Receptors may be sensitive to **noise** issues on this section. Supporting Road Safety Foundation (RSF) data also indicates that on the route there is a relatively higher percentage of fatal or serious **collisions** involving walkers, cyclists and horse riders.	✓	✓
M4 from Junction 8/9 to Junction 10	**C**	Relatively higher numbers of people **killed or seriously injured** on the mainline in both directions. Supporting RSF data also indicates that on the route there is a relatively higher percentage of fatal or serious **collisions** involving involving **walkers, cyclists and horse riders** on this section. **Seasonal delay** is noted between Junctions 4B and 12 of the M4. There is an **AQMA** in Bray in close proximity to the Holyport Interchange and another on the M4 between Junctions 8/9 to 12). Receptors in this section may be sensitive to **noise** and **air quality** issues on the M4 at Junction 8/9. There are also **development** aspirations for strategic growth in and around Maidenhead	✓	✓
M4 from Junction 10 to Junction 13	**D**	Relatively higher numbers of people **killed or seriously injured** on the mainline between Junction 12 and Bradfield westbound, between Junctions 14 and 12 eastbound, and between Junctions 11 and 10 eastbound. Supporting RSF data also indicates that on the route there is a relatively higher percentage of fatal or serious **collisions** involving **walkers, cyclists and horse riders** on part of this section. Seasonal delay is also noted between Junctions 4B and 12 of the M4. **Congestion** was highlighted as a problem by interested parties, particularly at peak times. There are aspirations for **residential and employment development** sites near to Junction 11 and south of Reading. Junction 12 is one such example where there is limited connectivity for **vulnerable road users**. Pockets of south Reading are in the top 5% for **deprivation** nationally. At Junction 13 and beyond there are insufficient **welfare facilities** for lorry drivers, with Reading Westbound, Eastbound and Chieveley at 'critical' level (120%, 94% and 102% respectively for lorry park utilisation). Receptors may be sensitive to **noise and air quality** issues on the M4 at Junctions 11 to 10. This section of route is also home to an **NIA and an AQMA** (M4 Junctions 8/9 to 12). Furthermore, this section of the route is considered to be at risk of **surface water flooding**.	✓	✓

Area location	Area of interest	Area issues	Now	Future road periods
M4 from Junction 14 to Junction 15	**E**	Relatively higher numbers of people **killed or seriously injured** on the mainline between Junction 17 and Membury services (west of Junction 14). Supporting RSF data also indicates that on the route there is a relatively higher percentage of fatal or serious **collisions involving walkers, cyclists and horse riders** on this section of the route. Interested parties mentioned that there are prospective impacts at Junction 15 of the M4 owing to nearby developments, where **queuing** occurs on the A419 approach. Supporting National Traffic Information Service (NTIS) HGV flow percentage data shows that on the route **HGV levels** make up 16% of total traffic on a part of the mainline on this section. Pockets of east Swindon are in the top 5% for **deprivation** nationally.		✓
M4 from Junction 15 to Junction 16	**F**	Relatively higher numbers of people **killed or seriously injured** on the mainline between Junction 17 and Membury services (west of Junction 14).	✓	✓
M4 from Junction 16 to Junction 17	**G**	Relatively higher numbers of people **killed or seriously injured** on the mainline between Junction 17 and Membury services (west of Junction 14). Supporting National Traffic Information Service (NTIS) HGV flow percentage data shows that on the route, Junction 16 westbound exhibits relatively higher **HGV levels**, making up 16% of total traffic.	✓	✓
M4 from Junction 18 to 21	**H**	Supporting National Traffic Information Service (NTIS) HGV flow percentage data shows that on the route M4 Junction 21 to M48 Junction 1 exhibits higher **HGV levels**, with HGVs making up 16 to 18% of total traffic. There are insufficient **welfare facilities** for lorry drivers; Leigh Delamere westbound services is at a 'critical' level for lorry park utilisation (85%). M4 Junctions 19 to 20 has **lower journey time reliability** westbound. Receptors may be sensitive to **noise** and **air quality** issues on the M4 mainline Junction 19 to 20 westbound. Receptors may be sensitive to **noise** issues between Junctions 19 and 18 westbound. There are major economic aspirations for the Avonmouth and Severnside area, which will see an increase in employment-led **development**.	✓	✓
		M32		
M32	**I**	Supporting RSF data also indicates that on the route there is a relatively higher percentage of fatal or serious **collisions** involving **walkers, cyclists or horse riders** on the M32. This section of the route has also been flagged by interested parties as a location of **severance** and **congestion. Average morning peak period delay** is also exhibited on this section of the route, and is predicted to experience additional delays into **2031**. This section of the route also has **lower journey time reliability**. Receptors may be sensitive to **noise** and **air quality** issues on this section, and is home to an **AQMA** and an NIA. East of the M32 is in the top 5% for **deprivation** nationally. There are also development **aspirations** near here.	✓	✓
		A404		
A404 at Marlow Roundabout to Handy Cross Roundabout at M40	**J**	Supporting RSF data indicates that on the route there is a relatively higher percentage of fatal or serious **collisions** involving **walkers, cyclists and horse riders** on this section of the route. **Average morning peak period delay** and **seasonal delay** is exhibited between Marlow and Handy Cross roundabout. This section also has lower **journey time reliability.** Interested parties mentioned that the A404 relieves pressure on the network connecting the M4 to the M40. However its performance is compromised by existing **congestion** further south at the Bisham roundabout. Interested parties also mentioned congestion at Handy Cross roundabout. There is also an **AQMA** at Handy Cross Roundabout and its immediate surrounding area. At Marlow the route is considered to be at risk of **surface water flooding**.	✓	✓

Area location	Area of interest	Area issues	Now	Future road periods
		A417/A419		
A419 at M4 Junction 15 to Cricklade	**K**	Relatively higher numbers of people **killed or seriously injured** have been identified on this section of the route. This section of the route has a **2-star iRAP safety** rating. The A419 southbound approach to M4 Junction 15 also has **seasonal** and **average morning peak period delay**. Receptors may be sensitive to noise and **air quality** issues on this section of the route. There is an **NIA** at Swindon on the A419.	✓	✓
A417/A436 junction (Air Balloon Roundabout)	**L**	Relatively higher numbers of people **killed or seriously injured** have been identified on this section of the route. Supporting **RSF** data also indicates that on the route there is a relatively higher percentage of fatal or serious **collisions** involving **walkers, cyclists and horse riders** on this section. **Average morning peak period delay and seasonal delay** is exhibited on the A417 approaches. This section of the route has **lower journey time reliability** and a **1-star iRAP safety** rating.	✓	✓
A417 at Junction 11A of M5	**M**	There are development aspirations for nearby sites including the Golden Valley **development**. Pockets of South Gloucester are in the top 5% for **deprivation** nationally.	✓	✓

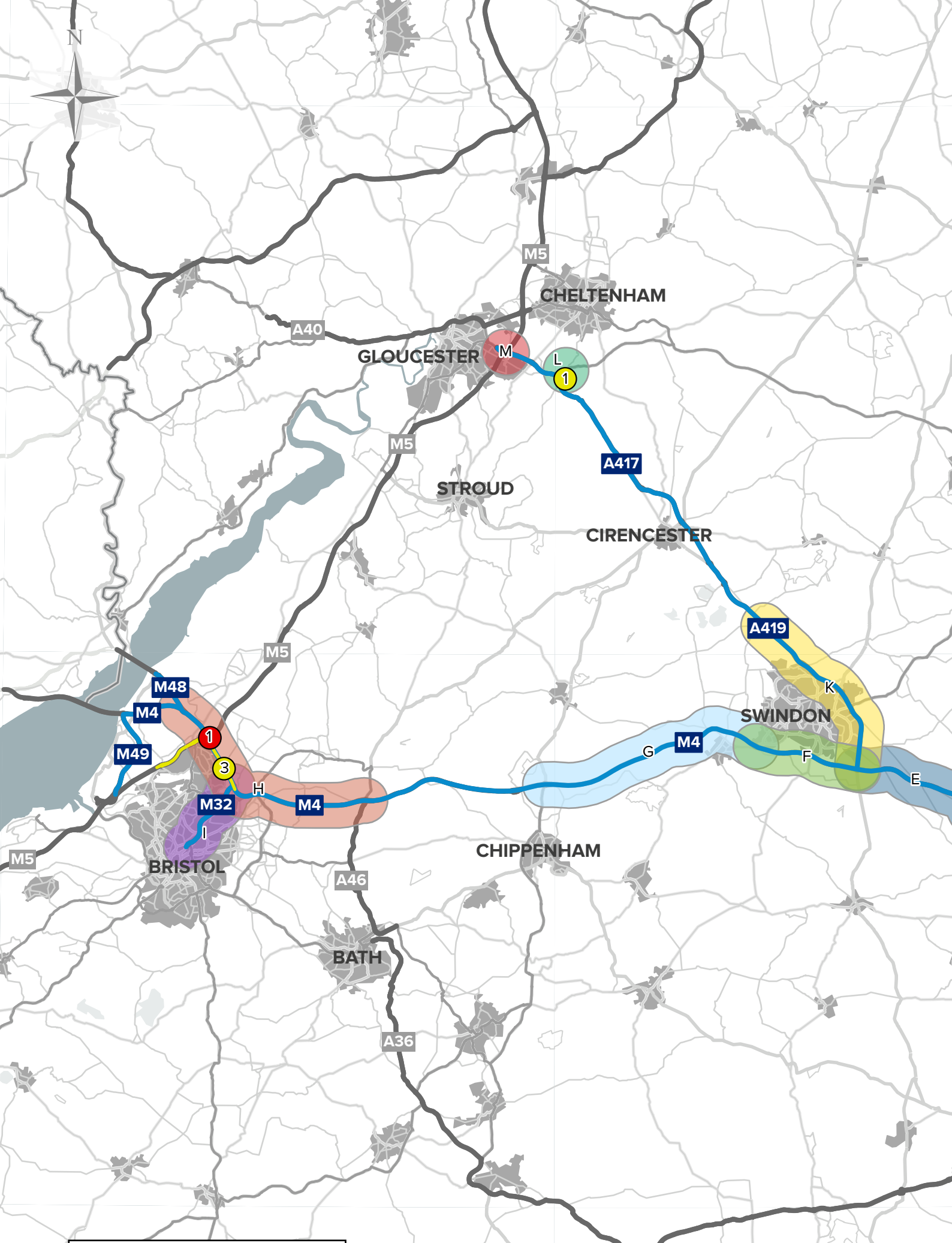

Figure 26: Areas of interest for further investigation

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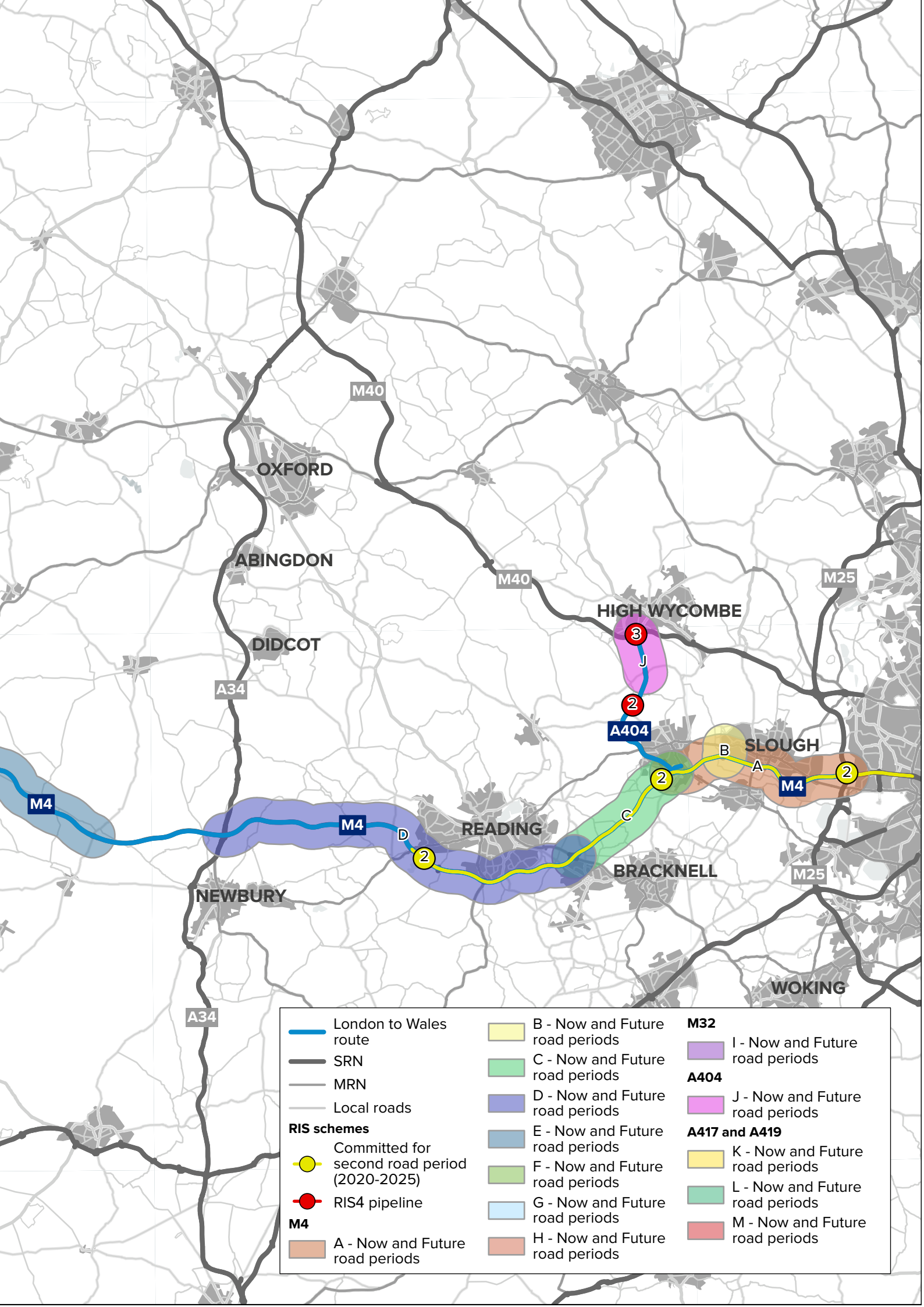
M40
OXFORD
ABINGDON
M40
M25
HIGH WYCOMBE
DIDCOT
A34
3
J
2
A404
SLOUGH
B
A
2
2
M4
M4
M4
D
READING
C
2
BRACKNELL
M25
NEWBURY
WOKING
A34
London to Wales route
SRN
MRN
Local roads
RIS schemes
Committed for second road period (2020-2025)
RIS4 pipeline
M4
A - Now and Future road periods
B - Now and Future road periods
C - Now and Future road periods
D - Now and Future road periods
E - Now and Future road periods
F - Now and Future road periods
G - Now and Future road periods
H - Now and Future road periods
M32
I - Now and Future road periods
A404
J - Now and Future road periods
A417 and A419
K - Now and Future road periods
L - Now and Future road periods
M - Now and Future road periods

What happens next

08 Next steps

Our route strategies allow informed decisions to be made about our network. They have informed our *Strategic Road Network* (SRN) *Initial report*, which sets our vision and priorities for the third road period (2025–2030) and beyond (from 2030). They are a forward planning tool for National Highways and our interested parties in their decision making, helping identify locations on our network for further consideration to inform investment opportunities, as well as to support decisions in prioritising potential solutions to enable us to continue to operate and maintain our network.

Alignment

They also align with National Highways *Connecting the country: Our long-term strategic plan to 2050*[56] which sets out our 2050 vision for the SRN to be part of a seamlessly-integrated transport system that meets our customers' needs by connecting the country safely and reliably, delivering economic prosperity, social value and a thriving environment. *Our long-term strategic plan to 2050* describes the short, medium and long-term steps to 2050 we believe are needed to make our vision a reality over successive road periods and has been informed by extensive horizon scanning, foresight analysis and engagement with key stakeholders across 9 focus areas. The route objectives identified in the route strategies, which also respond to the needs of stakeholders, road users and communities, and the locations for further consideration to achieve these objectives are aligned with the 2050 vision.

Informing the next stage of planning

The route objectives and locations for further consideration will be used to inform our study programmes and consider opportunities for developing integrated and collaborative solutions with our interested parties.

The extensive engagement we have undertaken ensures feedback from our customers and neighbours is used to inform investment decisions. They will help us consider the interaction of our SRN with other transport networks, including the major road network and local roads. We also expect interested parties will use our route strategies to inform their wider investment programmes, supporting collaborative decision making.

For both the Route strategy initial overview reports and *Our long-term strategic plan to 2050*, there will be an opportunity for stakeholders, road users and communities to provide their feedback. This will be alongside DfT's separate consultation on the *SRN Initial Report* published at the same time.

The 20 finalised Route strategy reports and *Our long-term strategic plan to 2050* will be published by 2025, the end of the current RIS period, informing the *Strategic business plan* and *Delivery plan*.

Provide your feedback

To find out more about our route strategies and the development process, please visit our website: nationalhighways.co.uk/our-roads/our-route-strategies/

56 National Highways (2022) *Connecting the country: Our long-term strategic plan to 2050*. https://nationalhighways.co.uk/delivery-plan/

Glossary of terms

Term	Acronym	Description
Active users and active modes of transport		Active users and active modes of transport refers to walkers, cyclists and horse riders.
Air quality management area	AQMA	If a local authority identifies any locations within its boundaries where the Air Quality Objectives are not likely to be achieved, it must declare the area as an Air Quality Management Area (AQMA). The area may encompass just one or two streets, or it could be much bigger. The local authority is subsequently required to put together a plan to improve air quality in that area - a Local Air Quality Action Plan.
All Lane Running	ALR	All Lane Running (ALR) motorways apply controlled motorway technology, permanently converting the hard shoulder as a running lane, and feature emergency areas.
Area of Outstanding Natural Beauty	AONB	An area of outstanding natural beauty (AONB) is one of the classes of land protected by the Countryside and Rights of Way Act 2000 (CROW Act). It protects the land to conserve and enhance its natural beauty.
A-roads		Major roads intended to provide large-scale transport links between regional towns and cities.
Assets		National Highway's assets include our infrastructure such as pavements, structures and tunnels
At-Grade Junction		An at-grade junction is a junction where two or more roads converge, diverge, meet or cross at the same height, as opposed to an interchange, which uses bridges or tunnels to separate different roads.
Average peak period delay		Average peak period delay is measured in seconds per vehicle mile and is the difference between average delay in the morning or afternoon and the average delay during free flow conditions.
Clean Air Zone	CAZ	A clean air zone (CAZ) defines an area where targeted action is taken to improve air quality, and resources are prioritised and co-ordinated to deliver improved health benefits and support economic growth.
Collisions		The severity of a collision is based on the severity of the most severely injured casualty and is broken down into: Slight collision: One in which at least one person is slightly injured but no person is killed or seriously injured. Serious collision: One in which at least one person is seriously injured but no person (other than a confirmed suicide) is killed. Fatal collision: A collision in which at least one person is killed.
Department for Transport	DfT	Department for Transport (DfT) plan and invest in transport infrastructure to keep the UK on the move. DfT work with agencies and partners to support the transport network that helps the UK's businesses and gets people and goods travelling around the country.

Term	Acronym	Description
Design-Build-Finance-Operate arrangements	DBFO	With a design-build-finance-operate arrangement, the private party provides financing and design, then builds and operates the facility. The public partner provides funding while the project is being used or is active.
Diversionary Routes		Highways England agreed diversion routes represent the recommended routes for road users when a section of road has been closed.
Dynamic Hard Shoulder	DHS	Dynamic Hard Shoulder Running (DHS) motorways apply the controlled motorway technology and temporarily increase capacity by utilising the hard shoulder, and feature emergency areas. The hard shoulder is some of the time, but not always, used as a live running lane, with electronic signs to guide drivers when it is safe to use for live running.
Economic opportunity areas	EOAs	EOAs were developed to give us a more refined understanding of the types of priority economic growth opportunities that exist around the SRN and around the wider road and broader transport network. They are defined in terms of their common economic function and the spatial features of the location. These key growth areas are grouped by broad 'theme' (such as international gateways, multi-modal transport hubs, tourism destinations and housing locations) and their relative reliance on the SRN.
Freeport		Freeports are special areas within the UK's borders where different economic regulations apply. Freeports in England are centred around one or more air, rail, or seaport, but can extend up to 45km beyond the port(s).
Growth Boards		Growth Boards have been established by some counties as a joined-up way of managing local future growth and supporting economic recovery.
Heavy Goods Vehicle	HGV	A heavy goods vehicle (HGV) is a large vehicle intended for the transportation of heavy loads.
International connectivity		Transport connectivity of the United Kingdom with Europe and the rest of the world.
In-vehicle Technology		This can be in-car systems that typically take the form of a touchscreen or display that is mounted on the dashboard. It can be a collection of hardware and software, which can provide information, data and connectivity to infrastructure to support the customer experience. It can also be the data and technology capability to enable the operation of the car (this might be connected services, autonomous capability, parking sensors, cameras etc.). It can be any technology within a vehicle.
Levelling up		Levelling up is a moral, social and economic programme for the whole of government. It places emphasis on ensuring no community is left behind.
Local Road Network		England's road network consists of motorways, major 'A' roads, and local classified and unclassified roads. The vast majority of motorways and major 'A' roads for the Strategic Road Network (SRN) and are managed by National Highways. All other roads are managed by local authorities and make up the local road network (LRN).
Major Road Network	MRN	The major road network (MRN) is the middle tier of England's road network, comprising the busiest and most economically important local authority A-roads.

Glossary of terms

Term	Acronym	Description
National Traffic Information Service	NTIS	The National Traffic Information Service (NTIS) is provided by National Highways. The Traffic England website provides a range of services to help you avoid delays and plan your journeys but NTIS also makes data available to subscribers for research purposes or for developers to include it in their own applications.
NTIS HGV Flow Percentage	NTIS HGV	Percentage of HGVs Annual Average Daily Flow (AADF) of all vehicles AADF
Noise Action Plans		Noise action plans provide a framework to manage environmental noise and its effects. They also aim to protect quiet areas in agglomerations (large urban areas) where the noise quality is good. Noise Action Plans provide a framework for the local management of the Important Areas.
Noise Important Areas		Noise Important Areas (NIAs) for roads and railways are based upon the strategic noise maps results and are produced in line with the requirements set out in the noise action plans.
Office of Rail and Road	ORR	The Office of Rail and Road (ORR) is the independent safety and economic regulator for Britain's railways and monitor of National Highways
Park and ride		A park and ride offers parking with public transport connections that allows commuters and other people heading to city centres to leave their vehicles and transfer to bus, rail or car share for the remainder of the journey.
Platooning		Heavy Goods Vehicle (HGV) platooning is the use of technology to allow HGVs to travel safely in close proximity at speed with the driver of the lead vehicle controlling the speed, acceleration and braking of the whole 'platoon'.
Receptor (Air quality and Noise)		Location which is sensitive to noise/air quality issues 300m has been used as the parameter for noise receptors as it's an appropriate length to differentiate between SRN and local roads. 100m has been used for air quality as the distance by which pollutants travel in high concentrations that may have an impact on health.
Regional Traffic Model	RTM	National Highways has a suite of five regional traffic models (RTMs) covering England's SRN. The models allow us to identify future performance and delay on the network, assisting with the development of the route strategies
Reliability		Reliability is the difference between the typical travel time, allowing for recurring delays, and the observed travel time. This measures the amount of variation due to unexpected variations or unplanned events. Like delay, it is measured in seconds per vehicle per mile. It is a concern for most drivers, but particularly affects just-in-time freight traffic and other strategic journeys.
Road period		The defined period of time over which the Government gives a funding commitment. The length of a road period will be specified at the beginning of the RIS development process. Road periods will be multi-year in order to provide the supply chain with increased certainty of investment and intent. Based on current practice within the other infrastructure sectors, it is expected that road periods will continue to be five years in length, though the actual length will be decided by the Government of the day.
RSF Percent of WCH (Walker Cyclist and Horse Rider) crashes	RSF WCH	Number of WCH fatal and serious crashes as a percentage of all user fatal and serious crashes (2017 - 2019 3-year average).

Term	Acronym	Description
Route objectives		Objectives for each route, informed by engagement and analysis, to support the current and future needs of customers and neighbours.
Safe System approach		The Safe System is the current best practice safety culture in road safety, developed over many years and derived most notably from the Swedish Vision Zero and Dutch Sustainable Safety strategies. A best practice road safety culture approach based on the principles that humans make mistakes which could lead to serious injury or death for which it is a shared responsibility of the road user, road managers, vehicle manufacturers, etc. to take appropriate actions to ensure road collisions do not lead to serious or fatal injuries.
Seasonal delay		Seasonal delay refers to the difference between the average afternoon peak delay for Fridays in August 2019 (high demand in summer holidays) and the average delay during very low demand periods (in this case, Christmas day is used). This measure is designed to reflect the parts of the network that do not appear to have a problem on average over the year but have seasonal peaks. Seasonal delay is of interest to tourist traffic, particularly people travelling to airports, or other destinations where arriving later than intended could have significant implications.
Severance		Severance is where transport infrastructure or motorised traffic passes through settlements and acts as a physical or psychological barrier, limiting people's ability or desire to move through that area. This can reduce accessibility to key services, and damage local social networks and community cohesion.
Sites of Special Scientific Interest	SSSIs	A Site of Special Scientific Interest (SSSI) is the land notified as an SSSI under the Wildlife and Countryside Act (1981), as amended. SSSI are the finest sites for wildlife and natural features in England, supporting many characteristic, rare and endangered species, habitats and natural features.
Smart motorway		A smart motorway is a section of motorway that employs active traffic management (ATM) techniques to increase capacity through the use of technology including variable speed limits. There are three types of smart motorway: 1. Controlled Motorway: variable speed limits with the hard shoulder operating as it would on a conventional motorway. 2. Dynamic Hard Shoulder (DHS) Running: Variable speed limits with the hard shoulder selectively opened as a running lane during periods where traffic levels are too high for only three lanes of running traffic. When activated, vehicles can use the hard shoulder as a running lane. 3. All Lane Running (ALR): variable speed limits with the hard shoulder removed and converted to a permanent running lane. Smart motorways have a whole system of inter-related safety features, not present on conventional motorways, working together to help keep drivers and their passengers moving safely. The system includes: • Variable speed limits to help keep traffic moving, reducing frustrating stop-start traffic and making journeys quicker • Clearly signed and orange-coloured emergency areas set back from the road and with telephones linking directly to our control rooms • Detection systems to monitor traffic for changes in flows • CCTV cameras that our operators are able to move and zoom to monitor and manage congestion and incidents, where notified. The system has the ability to see 100% of the carriageway • Signs and signals to provide better information to drivers which can alert drivers to hazards ahead and display Red X signs to close lanes to other traffic when a stopped vehicle is identified • Enforcement cameras to deter the minority who break speed limits and ignore Red X signs • Radar stopped vehicle detection
Spatial planning		Spatial planning decides how land should be used or protected. It also organises, designs and makes decisions on where new homes, roads and other infrastructure should be built. Spatial planning aims to make places attractive, safe and environmentally friendly. National Highways is a statutory consultee in the planning system and we encouraged others to seek early advice from us if their development proposal is likely to impact the strategic road network.

Glossary of terms

Term	Acronym	Description
Special Areas of Conservation	SACs	A Special Area of Conservation (SAC) is the land designated under Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora.
STATS19		Data on road traffic casualties on the roads in Great Britain are collected via the STATS19 process. These statistics are collected by police forces, either through officers attending the scene of incidents, from members of the public reporting the incident in police stations after the incident, or more recently online and then validated and published annually by DfT. STATS19 road traffic collision and casualty data is published annually by DfT in the Autumn and provides details of the previous calendar year. These reports have used the data available at the time of analysis, 2015-2018.
Statutory consultee		Statutory consultees are those organisations and bodies, defined by statute, which local planning authorities are legally required to consult before reaching a decision on relevant planning applications.
Strategic Rail Freight Interchange		A large multi-purpose rail freight interchange and distribution centre linked into both the rail and road system
Strategic Road Network	SRN	The strategic road network (SRN) covers more than 4,500 miles of motorways and major A-roads.
Strategic Traffic / Strategic journeys		Long distance traffic / journeys.
Sub-National Transport Bodies	STBs	Sub-national Transport Bodies (STBs) have a key role in formulating transport strategy and identifying investment priorities at the sub-national level, including for highways. There are 7 STBs in England, who are tasked with developing transport strategies and studies for their region. Through the development of their evidence bases with their constituent local authorities and Local Enterprise Partnerships, their work highlights multi-modal issues, need and opportunities, with investment priorities provided to the Secretary of State for Transport.
Transport-related social exclusion		Where limited access to transport or other issues with the transport system means that people cannot fully participate in society in the way they would like.
Trunking / De-trunking		De-trunking is the process of returning a National Highways' road to the local highway authority control and visa versa for trunking.
UNESCO World Heritage Site		Inscription as a UNESCO World Heritage Site is an acknowledgement of the global significance of such places.
Union connectivity		Transport connectivity between the nations of the United Kingdom.
Variable Messaging Signs		The Traffic Signs Regulations and General Direction 2016 (TSRGD) define a variable message sign as a device "...capable of displaying, at different times, two or more aspects...". These aspects may take the form of a sign prescribed by the TSRGD, a legend in accordance with Schedule 16 to TSRGD, a non-prescribed temporary sign or a blank grey or blank black face. Thus, the expression "variable message sign" (VMS) encompasses all types of variable sign from simple flap-type signs to complex light-emitting panels.'
Vulnerable Road User		Walkers, cyclists and horse riders

national highways

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