

Key questions for road investment and spending

January 2023

Foreword

Roads are the arteries of economic and social prosperity. They also come at a cost to the public purse and in terms of the negative consequences arising from their construction, maintenance and use. As the road network in the UK has expanded, it has supported but also shaped society. In a world beset by global shocks and the climate and nature emergency, weighing up the make-up and scale of our investment in roads and how they are used matters more than ever if we are to secure effective outcomes environmentally, socially and economically.



This report has been prepared at a critical time for road investment and expenditure in England, and beyond. The third Road Investment Strategy is under development. The National Policy Statement for National Networks is under review. There are considerable financial pressures facing national and local governments. COP 27 (climate change) and COP 15 (biodiversity) have just taken place.

In this report we have identified what we consider to be some of the most important and pressing questions that should be considered in the handling of national and local road investment and expenditure. Not addressing them would, we believe, be a false economy while engaging fully with them can enable robust and timely progress.

Professor Glenn Lyons, Road Investment Scrutiny Panel Chair

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Executive Summary

This report seeks to provide a source of provocation (or perhaps affirmation) and constructive challenge to the reader, and especially to those in a position to influence the future of road investment and expenditure - and thereby the nature of the service that our roads will provide in the future.

Why was the Road Investment Scrutiny Panel formed?

In October 2022, with funding from the Rees Jeffreys Road Fund, a group of senior professionals assembled to form the Road Investment Scrutiny Panel with the aim of exploring and setting out shared concerns about forthcoming decisions on road investment and spending.

The Panel was convened at a critical time for all those involved in decisions about road investment and spending nationally and locally, due to a variety of factors including: the pressing legal and moral obligation to decarbonise; mounting international and national commitments to tackle biodiversity decline; the impact of the COVID 19 pandemic; departure from the European Union; an increase in the frequency and severity of extreme weather events; higher energy costs; inflationary pressure in the construction sector alongside significant constraints on the public purse; and work being underway to refresh the National Networks National Policy Statement and develop the third Road Investment Strategy. Together these have implications for future travel behaviour and the performance of transport infrastructure that are complex and difficult to anticipate.

Determining the right way forward in these circumstances is not easy. There are challenging trade-offs to be addressed, and there can be stark differences between a broad consensus strategically and views on the approach to be taken on a particular road or street.

Against this backdrop the Panel has explored questions around the scale and purpose of future spending on road investment, maintenance and operation. We believe that if these issues are tackled well - particularly in relation to schemes involving capacity enhancement - the result could be to reduce the level of legal challenge and procedural difficulties that have caused, and otherwise seem set to continue to cause, many schemes to become bogged down procedurally.

The challenge questions

The Panel has identified a set of seven key questions relating to the concerns we have surfaced through our discussions about the path possibly about to be pursued. The questions relate to issues of national importance but apply to decisions from the largest mega projects right through to the provision of routine maintenance on local streets.

Our questions and a high-level account of what concerns us - as well as what we would need to see to allay our concerns - are as follows (discussed in more detail in the body of this report):

Decarbonisation

Q1 What would make us feel confident that decisions on future road investment, at both the scheme and aggregate level, are consistent with the legal obligation to deliver a credible pathway to the decarbonisation of the UK economy by 2050?

We are concerned that...

- investment to generate enhanced road capacity for motor traffic and the assumptions on future road use on which this is based may run counter to the course we need to steer to meet our decarbonisation obligations

We would like to see...

- analytical consistency between road expenditure decisions with capacity implications and the trajectory necessary for whole economy decarbonisation - demonstrated through greater transparency in how results, conclusions and evidence are presented
- clarity on how the trade-offs around the road network's contribution to achieving Net Zero will be managed, who will be accountable for these decisions and how their performance will be scrutinised
- demonstration of consistent and competent application of carbon valuation in appraisal

Biodiversity

Q2 What would make us feel confident that the policy imperative and opportunities to promote biodiversity enhancement are being recognised and pursued on their own merits, as opposed to biodiversity being 'accommodated' in pursuit of other goals?

We are concerned that...

- biodiversity may be insufficiently treated as an investment priority in its own right by National Highways and other highway authorities, in spite of its value and tightened legal requirements

We would like to see...

- evidence of a strategic effort, at scale, to invest in the highways estate specifically to achieve biodiversity enhancement (and deliver co-benefits such as those relating to decarbonisation and public health)
- avoidance of the use of biodiversity offsetting for rare or slow-growing habitat types
- greater transparency of evidence, analysis and assumptions that inform biodiversity-related investment decisions

Health and social impacts

Q3 How can we be persuaded that the health and social impacts of road spending experienced by individual people and communities are well understood and given sufficient weight at all stages of decision-making?

We are concerned that...

- the local benefits and disbenefits of road investment tend to be averaged out in appraisal at an area level but are experienced unevenly by constituent individuals and neighbourhoods such that investment showing an overall net benefit may disproportionately blight the lives of some individuals and communities who may not be adequately recognised or compensated

We would like to see...

- evidence that the detailed distribution and concentration of the benefits and detriments to health and livelihoods arising from road schemes experienced by individuals and communities are being identified and given appropriate weighting at every stage of decision-making
- evidence that claimed Social Value benefits, such as increased employment opportunities created by schemes, are realistic and accessible by the intended beneficiaries
- greater regard given to international practice, including latest World Health Organisation guidance

Maintenance and optimisation

Q4 What would give us confidence that appropriate financial provision is being made for operating, maintaining and optimising the performance of the existing road network?

We are concerned that...

- while the Road Investment Strategy process ensures that the maintenance of the strategic road network in England, as managed by National Highways, benefits from substantial committed funding and is subject to extensive scrutiny involving a degree of independent oversight, the same cannot be said for the vast majority of roads which are the responsibility of local highway authorities

We would like to see...

- a well-informed process leading to sufficient national and local highway maintenance spending across the entire network
- a funding framework for local highways that would provide for a better balance between managing near-term budgetary pressures and minimising whole-life costs
- greater attention given to how best to optimise the service we get from our road network,

including the allocation of road space, in ways that are complementary to the delivery of planned maintenance activity

Safety

Q5 What would persuade us that options for investing in improving road safety are being identified and weighed appropriately?

We are concerned that...

- too many lives are still being lost and life-changing injuries suffered on our roads
- we might not be spending the right amounts in the ways most likely to generate the best effects in terms of the greatest reduction in deaths and life-changing injuries

We would like to see...

- analysis that examines the make-up and extent of spending at the aggregate level that directly and indirectly addresses road safety risks
- much more attention given to 'lead' rather than 'lag' indicators across all roads - for example using increasingly available data sources (such as vehicle speeds and harshness of braking) to identify where and why safety risks are likely to arise and inform decisions on appropriate risk mitigations, while relying less on historic data (for example about individual crash locations)
- evidence of consideration being given to all available options (including infrastructure measures, regulation, and enforcement) to get the best returns for safety

Consideration of alternatives

Q6 What would persuade us that road investment and expenditure decisions - at the scheme and programme level - are the result of serious consideration of a genuinely broad range of options and their merits?

We are concerned that...

- the selection of which projects to implement may not be based on a sufficiently wide-ranging review of alternative options (including no-build or low-build solutions such as demand management) for meeting high-level objectives or resolving specific local issues
- problem/opportunity definition and selection of options to be assessed both risk being too constrained by organisational interests, siloed funding allocations, or simply adherence to established practice

We would like to see...

- evidence of decision-makers informed by and drawing on a wider range of expertise, experience and perspectives, from inside and

outside the sector, at all stages of decision-making

- transparency of the processes through which options for schemes are narrowed down that demonstrates serious consideration being given to a broad range of possible solutions

Robustness of investment decisions in a changing world

Q7 What would persuade us that road investment and expenditure decisions are likely to represent value for money over the long term?

We are concerned that...

- the decision-making process may not be engaging sufficiently with uncertainty about the future and therefore lacks robustness to the possibility of changed circumstances (for example the nature, extent and severity of climate change effects, or anticipated developments failing to materialise or being delivered later than expected)

We would like to see...

- testing of investment decisions against a wide range of plausible scenarios (including those that involve reductions in motor traffic volumes and step changes in sustainable and active travel)
- greater openness about the work that has been done to test options for their robustness against future scenarios, and a willingness to revisit this assessment at key stages of scheme development
- evidence of portfolios of smaller interventions with a lower risk profile being given serious consideration (including those aimed at reducing travel demand)

Emerging themes

Looking across the seven questions in the round, some common themes emerge:

- the need for more **transparency** to allow scrutiny of decisions and the associated trade-offs, including a greater willingness to share any underpinning analysis;
- a need for a more clearly **coherent** approach to decisions, which recognises road investment's role as an enabler of other objectives and which ensures that decisions are demonstrably consistent with broader obligations, including statutory requirements in areas such as decarbonisation and biodiversity;
- a wish to see that individual schemes are fully and proportionately **compliant** with evolving procedural obligations and standards, such as those set out in HM Treasury's Green Book;
- a need to ensure that decision-making is well-informed and draws upon a wide and diverse range of expertise and perspectives (including non-transport specialists); and

- a sense that all of the above could be well-served by a greater role for **independent scrutiny** of decision-making, in particular where it falls to scheme promoters to amass evidence and generate a business case for their preferred option.

Timing

The Panel discussed whether the concerns raised in this report warrant a call for a pause to decision-making, particularly in respect of new schemes that would accommodate material growth in motor traffic (while recognising that other spending to keep the road network serviceable would continue). Time for reflection and reassessment is, however, constrained. The Panel recognises that for the National Highways network (as for the railways) the Government is bound by statutory timescales, in this case for completing the Road Investment Strategy, and is also under pressure to complete the review of the National Networks National Policy Statement. The Panel also recognises that uncertainty is no friend to investment planning, nor to a supply chain already wrestling with inflationary pressures.

This does not, however, take away the pressing need to engage with the questions on decarbonisation, biodiversity, health and social impacts, maintenance and optimisation, and safety that the Panel has raised - and in particular the tension between adding any new capacity to the network at the same time as staying within the carbon reduction trajectory needed to meet the Sixth Carbon Budget (as reflected in the Department for Transport's Transport Decarbonisation Plan).

Recent experience with the halting passage of schemes through the Development Consent Order process and the time and effort involved in generating responses to legal challenges suggests to the Panel that time could be saved, rather than lost, by engaging rapidly with the questions we have identified. Doing so could, we believe, fit in part if not fully within the Road Investment Strategy timetable, which runs out until 2024-5 (and covers far more than the high-profile programme of capacity enhancement projects that the Government wants National Highways to pursue). The extent of flexibility on timetable (and steps therein) within legal parameters and what is administratively feasible would need closer examination.

It follows that we recommend, however challenging, that the Government should:

- (i) publish a projection of the change in vehicle miles by carbon-emitting vehicles necessary or prudent to stay within an acceptable carbon reduction trajectory (recognising that this will have to be carried out against an uncertain cross-sectoral backdrop);
- (ii) indicate with sufficient confidence how such change can be achieved in practice in the required timescale (recognising that time is getting very short for fresh measures to be developed and implemented); and
- (iii) make this analysis available as the basis for decisions on individual capacity-increasing road schemes.

We also recommend that this analysis should then be applied as part of the approval process for capacity-increasing schemes still in their pre-construction development phases (i.e. before contracts have been signed for the commencement of work), including schemes in the second Road Investment Strategy, schemes being developed for possible inclusion in the third Road Investment Strategy and thereafter, and major schemes developed by local authorities.

Such analysis and its scrutiny should not displace or detract from the need for attention to be given to the questions we have highlighted beyond decarbonisation - we commend them to

those responsible for the spending decisions that will shape the condition and performance of our roads - nationally and locally - for many years to come.

The Panel recognises that engagement with the questions we have surfaced could take different forms and we are very open to discuss how best to proceed.

Road Investment Scrutiny Panel



Professor Jillian Anable - Professor of Transport and Energy, University of Leeds. Researching the future of the car, Chair (since 2017) of the Research & Evidence Working Group for the National Transport Strategy for Scotland Review, and 2022 Transport Planner of the Year.



Professor Nicola Christie - Professor of Transport Safety, University College London. An active researcher in road safety since 1985 (including 16 years at the TRL) and a member of the Parliamentary Advisory Council for Transport Safety.



Professor Zoe Davies - Professor of Biodiversity Conservation, University of Kent. Specialises in conservation practice and policy, and in impacts of environmental change, is a member of the Natural England Science Advisory Committee, and a former member of the British Ecological Society Council.



Professor Stephen Glaister - Emeritus Professor of Transport and Infrastructure, Imperial College London and Associate, the London School of Economics. Former Chair of the Office of Rail and Road, member of the Government's first Advisory Committee on Trunk Road Assessment and past Managing Editor of the Journal of Transport Economics and Policy.



Professor Steve Gooding (Co-convenor) - Visiting Professor, UWE Bristol and Director of the RAC Foundation. Past President of the Chartered Institute of Logistics and Transport, and former Director General of the Roads, Traffic and Local Transport Group at the Department for Transport (DfT).



Professor Phil Goodwin - Emeritus Professor of Transport Policy, UCL and UWE Bristol. Formerly Director of TSU Oxford University. Research on transport policy and project appraisal since the 1980s, Ministerial appointments as member of SACTRA, chair of advisory panel for the 1998 Transport White Paper, and currently on the DfT's Joint Analysis Development Panel. Experience of major project appraisal, including as technical critic of proposed Stonehenge-A303 and Lower Thames Crossing.



Professor Karen Lucas - Professor of Human Geography, University of Manchester. A world-leading expert on transport and social justice in the Global North and South, and devising a new integrated methodology for the social assessment of road projects for National Highways.



Professor Glenn Lyons (Chair) - Mott MacDonald Professor of Future Mobility, UWE Bristol. Member of the Wales Roads Review Panel, member of the DfT's Joint Analysis Development Panel, former Strategy Director of the New Zealand Ministry of Transport, and recipient in 2022 of the Chartered Institution of Highways and Transportation (CIHT) Institution Award for a significant contribution that has benefited the public and the profession.



Andrew Crudgington (Secretary) - Researcher, technical writer and facilitator. Formerly head of policy at the Institution of Civil Engineers and then Director of External Affairs and Strategy, and currently employed part-time at the CIHT as a Climate Change Associate.

Introduction

People rely on roads to provide them with access to employment, goods, services and opportunities. Roads support society and the economy. They do however come at a financial, environmental and social cost which must also be taken into account in decision-making on road investment. This report identifies important questions for future road investment and expenditure in England. The questions are directed at central and local government as well as others with responsibility for option generation, scheme development and appraisal. The intention is to offer a constructive provocation to those who have influence in determining the make-up and scale of future public investment and expenditure on roads.

Background and purpose

There are 190,000 miles of road length in England (two per cent of which is the strategic road network by road length). This compares to 36,800 miles in Scotland and 21,000 in Wales¹. This reflects, for England, a 500 mile (two per cent) increase for major roads (motorways and A roads) and a 4,300 mile (three per cent) increase for minor roads since 2005.

Roads don't simply exist to carry motor vehicles - engineers have traditionally referred to the 'highway' as comprising the 'carriageway' (for vehicles) and the 'footway' (for pedestrians). This broad view of the service provided by roads is increasingly important as our sense of what is required to get the best from them develops: as the condition of our motorways matters to freight traffic so the condition of our footways matters for promoting more walking; getting the most from our roads is not so much a matter of maximising vehicle throughput as accommodating the trips we need to make in the most sustainable way and with the least environmental impact.

Building new road capacity is resource intensive and often controversial. Maintaining the overall road network as a national public asset is a considerable undertaking.

We are at a critical moment regarding road policy and investment in England. In the face of a climate emergency, the High Court ruled in July 2022 that the Government's Net Zero Strategy was in breach of its own legislation and therefore unlawful². Road scheme proposals are facing legal challenges in relation to concerns over related carbon emissions and their wider health and social impacts. In June the Committee on Climate Change published its 2022 'Progress in reducing emissions' report³ in which it was critical of the lack of specific ambition of the Government to limit traffic growth. International and national commitments to tackle biodiversity decline are increasing. The UN biodiversity summit - COP15 - took place in December 2022 and almost 200 countries reached "a global commitment to halt and reverse biodiversity loss by 2030 and to protect 30% of land and oceans by the same date"⁴.

In December 2022 the Department for Transport published its National Road Traffic Projections⁵ based on its Common Analytical Scenarios⁶. The projections depict possible

¹ <https://www.gov.uk/government/statistics/road-lengths-in-great-britain-2021/road-lengths-in-great-britain-2021>

² <https://hansard.parliament.uk/commons/2022-07-21/debates/44BE0081-39C0-4F2B-AFAE-507684B55B7E/NetZeroStrategyHighCourtRuling>

³ <https://www.theccc.org.uk/publication/2022-progress-report-to-parliament/>

⁴ <https://www.gov.uk/government/news/new-deal-to-protect-nature-agreed-at-cop15>

⁵ <https://www.gov.uk/government/publications/national-road-traffic-projections>

⁶ <https://www.gov.uk/government/publications/tag-uncertainty-toolkit>

change in total annual distance driven on roads in England and Wales between 2025 and 2060 ranging from eight per cent to 54 per cent. A series of long-term drivers of change are making future travel behaviour and the performance and resilience of transport infrastructure much more difficult to anticipate. These include but are not limited to: the impact of the COVID 19 pandemic on work patterns; the potential changes to the UK's economic geography arising from the UK's departure from the European Union; and an increase in the frequency and severity of extreme weather events associated with climate change.

Inflationary pressure in the construction industry is combining with significant constraints on the public purse to squeeze the funding available to maintain an acceptable level of service from our roads. This is happening at a time when there is a broad political consensus in favour of promoting sustainable and active travel, creating a demand for works to adapt existing roads for alternative uses, which in turn raises issues about the allocation of road space.

It is against this challenging backdrop that the Government is developing two key pieces of policy. Firstly, the National Policy Statement for National Networks (NPS)⁷ is under review. The NPS “sets out the need for, and Government’s policies to deliver, development of nationally significant infrastructure projects (NSIPs) on the national road and rail networks in England”⁸. The current NPS was written in 2014 and, as discussed above, much has changed since then creating a need to “update forecasts on which it is based to reflect more recent, post-pandemic conditions”. Secondly, the development of the third Road Investment Strategy is under way. This will determine the objectives and budget for the strategic road network managed by National Highways for the period 2025-2030⁹.

These circumstances pose important challenges to the Government but also present an opportunity to establish firmer foundations for future road investment and spending. This has been the impetus for securing funding from the Rees Jeffreys Road Fund¹⁰ to establish what we have called the Road Investment Scrutiny Panel. The Panel is a group of senior professionals with considerable and diverse experience and expertise in relation to road and other transport investment considerations. Its purpose in producing this report has been to flag a suite of issues it feels should be in the minds of those taking decisions about road spending but that may not as yet universally be receiving the attention they deserve.

Approach

Membership of the Panel brings together expertise in road safety, transport economics, travel behaviour, biodiversity, climate change, social inequality, forecasting and uncertainty, future mobility, strategic planning, policymaking and policy advice, and scrutiny of investment. Individuals were invited to join the Panel on merit and with a shared brief to undertake a short, intensive exercise to draw out road investment considerations deemed important, but potentially underexamined and so warranting further attention.

A Panel Secretary was appointed to support the Chair and Co-convenor (both also active Panel members). Each Panel member addressed relevant background literature and then shared individually their views on issues of priority with the Secretary. These views were collated and synthesised into a list of issues - expressed as questions - that are important to road investment. Panel members then convened over two days in London to discuss these

⁷ <https://www.gov.uk/government/publications/national-policy-statement-for-national-networks>

⁸ <https://www.gov.uk/government/speeches/review-of-national-policy-statement-for-national-networks>

⁹ <https://www.gov.uk/government/publications/preparing-the-third-road-investment-strategy>

¹⁰ <https://www.reesjeffreys.co.uk/>

questions and explore concerns. A subsequent draft of this report was generated and reviewed by Panel members and then revised into this final document.

It is important to note that individual Panel members came to the exercise from different perspectives and with varied expertise, opinion and strength of feeling on the range of matters examined. The Panel's goal was to identify issues that may not be being sufficiently addressed in current decision-making - to that end the Panel members all agree on the importance of the seven questions as expressed in this report¹¹. What the Panel has not sought to do is to go on to develop a similarly firm consensus on what should follow, taking the view that this process would best be led by those responsible for the decisions, at a scheme and programme level.

Structure of the report

The following chapters of the report consider seven key questions concerning:

Outcomes of road spending	<ul style="list-style-type: none">• decarbonisation• biodiversity• health and social impacts• maintenance and optimisation• safety
Investment and appraisal process	<ul style="list-style-type: none">• consideration of alternatives• robustness of investment decisions in a changing world

The grounds for our questions are set out alongside potential opportunities for responding to them. In the concluding chapter of the report we reflect upon the strategic implications of the questions and how they might be responded to and associated matters of timing.

Enquiries

If having read this report you wish to provide any feedback to the Panel, please do so via the Panel Chair, Professor Glenn Lyons, who can be contacted via Glenn.Lyons@uwe.ac.uk.

¹¹ It should not be taken to be a comprehensive list of every relevant factor but reflects matters the Panel believes merit further attention.

Decarbonisation

Q1 What would make us feel confident that decisions on future road investment, at both the scheme and aggregate level, are consistent with the legal obligation to deliver a credible pathway to the decarbonisation of the UK economy by 2050?

We are concerned that...

- **investment to generate enhanced road capacity for motor traffic and the assumptions on future road use on which this is based may run counter to the course we need to steer to meet our decarbonisation obligations**

We would like to see...

- **analytical consistency between road expenditure decisions with capacity implications and the trajectory necessary for whole economy decarbonisation - demonstrated through greater transparency in how results, conclusions and evidence are presented**
- **clarity on how the trade-offs around the road network's contribution to achieving Net Zero will be managed, who will be accountable for these decisions and how their performance will be scrutinised**
- **demonstration of consistent and competent application of carbon valuation in appraisal**

Why is this important?

Decarbonisation is not just a political ambition but a legal and moral requirement. In the UK, road transport is one of the largest emitters of greenhouse gases within the overall economy and its decarbonisation at a suitable pace is therefore key to meeting our legal requirement under the Climate Change Act. It is important to note that this legal obligation is not only to fully decarbonise the UK economy by 2050 but also to follow a pathway of decarbonisation that complies with 5-yearly interim carbon budgets (set 12+ years in advance)¹².

To date, policy in this area has been primarily focused on (i) the reduction and removal of direct 'tailpipe' emissions from road vehicles' use (notably the commitment to end the sale of new purely petrol and diesel fuelled cars and vans from 2030); and (ii) decarbonising the construction process.

In recent years, however, there has been an increasingly intense debate¹³ around two questions: (i) can there be a credible pathway for the decarbonisation of road transport without a reduction in overall distance travelled in England by cars and vans?; and (ii) does it

¹² <https://www.theccc.org.uk/what-is-climate-change/a-legal-duty-to-act/>

¹³ See for example recent [analysis](#) by Transport for Quality of Life pointing to the prudence of road traffic reduction, targets set in Scotland and Wales for achieving road traffic reductions by the end of this decade, and legal challenges to scheme to enhance road capacity.

remain tenable and desirable to proceed with schemes that create additional road capacity, given the implications for traffic growth and related tailpipe emissions?

In our view, this debate reflects what at best might be characterised as a degree of ambiguity over the part that the overall volume of road traffic should play in transport decarbonisation. The Climate Change Committee has pointed to the need for a reduction in the rate of traffic growth. While it has contemplated different scenarios for reaching a Net Zero economy by 2050, its 'Balanced Net Zero Pathway'¹⁴ - considered to be a plausible and sensible course to follow in relation to the Sixth Carbon Budget (2033-2037) - assumes that total car miles do fall by 9% by 2035 relative to the baseline¹⁵. Meanwhile, as mentioned in the Introduction, road traffic (based on published policies and funded plans) is projected by the Department for Transport (DfT) to increase between eight and 54 per cent from 2025 to 2060¹⁶. In five of the eight DfT projections (including the 'Core' scenario), the emissions from road transport (i.e. all roads vehicles including cars, vans and lorries) still exceed 40 megatons of CO₂ equivalent per year by 2050. Total miles must also however be distinguished from carbon-emitting miles, further complicating the second question above as the automotive industry continues to gear up to an increasingly electrically-fuelled future.

Given that forecasts of traffic growth have played a significant part in making the case for capacity enhancements, we consider it reasonable to suggest that the ambiguity be addressed and greater clarity be provided to demonstrate compatibility with a plausible decarbonisation pathway that can stand up to legal scrutiny.

We also draw attention to the need to consider the uncertainty over global decarbonisation progress when examining future road network supply and demand nationally, recognising appraisal periods are now taking us close to the end of this century. National Highways in its 2022 report 'Preparing for climate change on the strategic road network'¹⁷ weighs up climate risk based on "a future world where global average temperatures are 2°C and 4°C above pre-industrial levels respectively [by 2100]".

We recognise that this debate is complicated by the fact that the percentage of new capacity (and potential associated additional emissions) added by any individual enhancement scheme will be small in comparison to the scale of the existing network. In our view, however, the scale and pace of emissions reductions required to address the unprecedented threat from climate change mean that any road spending that would accommodate additional motor traffic should be tested for consistency with a plausible trajectory to Net Zero.

What would give us confidence that this issue is being addressed?

Consistency and analytical robustness: We would like to see demonstrable consistency between the overarching legal requirement for decarbonisation of the whole economy, the content of key policy documents such as the Transport Decarbonisation Plan and the National Networks National Policy Statement, Road Investment Strategy decision-making, and the spending decisions of devolved administrations and local highway authorities.

¹⁴ This is made up of a combination of assumed changes, including take up of Zero Emission Vehicles and a reduction in travel demand, that, when modelled, could reduce surface transport emissions by around 70% (against 1990 levels) by 2035.

¹⁵ Climate Change Committee (2020). Sixth Carbon Budget – <https://www.theccc.org.uk/publication/sixth-carbon-budget/> - p.100, Balanced Net Pathway, assumptions to 2035: "Total car miles fall by 9% by 2035 relative to the baseline. This is driven by modal shift from cars to walking, cycling (including e-bikes) or public transport, an increase in average car occupancy and a reduction in travel from factors such as increased working from home"

¹⁶ <https://www.gov.uk/government/publications/national-road-traffic-projections>

¹⁷ <https://nationalhighways.co.uk/media/z1ndodqx/preparing-for-climate-change-on-the-strategic-road-network.pdf>

We recommend, however challenging, that the Government should consider, with provision for robust and credible scrutiny:

- (i) publishing a projection of the change in vehicle miles by carbon-emitting vehicles necessary or prudent to stay within an acceptable carbon reduction trajectory (recognising that this will have to be carried out against an uncertain cross-sectoral backdrop);
- (ii) indicating with sufficient confidence how such change can be achieved in practice in the required timescale (recognising that time is getting very short for fresh measures to be developed and implemented); and
- (iii) making this analysis available as the basis for decisions on individual capacity-increasing road schemes.

We also recommend that this analysis should then be applied as part of the approval process for capacity-increasing schemes still in their pre-construction development phases (i.e. before contracts have been signed for the commencement of work), including schemes in the second Road Investment Strategy, schemes being developed for possible inclusion in the third Road Investment Strategy and thereafter, and major schemes developed by local authorities.

Trade-offs: Any analysis of the pathway for decarbonisation for roads will need to take account of assumptions about how Net Zero is to be delivered across the whole economy. This will need to include the part, if any, expected to be played by road transport in offsetting emissions in other sectors, such as the significant projected emissions that could still exist in the aviation sector by 2050 (as set out in the Jet Zero strategy, published in July 2022¹⁸). The idea of trade-offs is built into the concept of Net Zero but these decisions and their consequences must be transparent and open to independent scrutiny.

Carbon Values: Carbon values already exist for use in appraisal and evaluation¹⁹. These may need to be updated but at this stage we see merit in having the existing values applied consistently and universally across all sectors - including transport. A well-constructed carbon pricing mechanism would in principle offer a valid policy tool as part of an approach to providing an effective decarbonisation pathway. However, we recognise the practical and political considerations that limit the extent to which purely economic, price-based, approaches might be applied (particularly when energy prices are such a large part of the inflationary pressure on domestic household budgets).

¹⁸ <https://www.gov.uk/government/publications/jet-zero-strategy-delivering-net-zero-aviation-by-2050>

¹⁹ <https://www.gov.uk/government/collections/carbon-valuation--2>

Biodiversity

Q2 What would make us feel confident that the policy imperative and opportunities to promote biodiversity enhancement are being recognised and pursued on their own merits, as opposed to biodiversity being ‘accommodated’ in pursuit of other goals?

We are concerned that...

- **biodiversity may be insufficiently treated as an investment priority in its own right by National Highways and other highway authorities, in spite of its value and tightened legal requirements**

We would like to see...

- **evidence of a strategic effort, at scale, to invest in the highways estate specifically to achieve biodiversity enhancement (and deliver co-benefits such as those relating to decarbonisation and public health)**
- **avoidance of the use of biodiversity offsetting for rare or slow-growing habitat types**
- **greater transparency of evidence, analysis and assumptions that inform biodiversity-related investment decisions**

Why is this important?

Biodiversity enhancement matters greatly, given the environmental crisis we face. Biodiversity loss and climate change should be seen as two interrelated components of a single environmental crisis, hence it would be unwise to tackle the two components in isolation: intact ecosystems need to be a core component of efforts to mitigate and adapt to climate change²⁰. Natural climate solutions or nature-based solutions, including the conservation, restoration and improved use of forests, wetlands and other ecosystems, are estimated as having the potential to provide one-third of the cost-effective mitigation²¹ required to deliver the goals of the Paris Agreement²², the key international agreement driving UK climate policy. Biodiversity also provides a wider range of benefits, such as improving human health, wellbeing and air quality, as well as reducing flood risk²³. For instance, it is estimated that access to nature has the potential to save the National Health Service up to £2bn per year²⁴.

²⁰ Gardner, C. J., Bicknell, J. E., Baldwin-Cantello, W., Struebig, M. J. and Davies, Z. G. (2019). Quantifying the impacts of defaunation on natural forest regeneration in a global meta-analysis. *Nature Communications*, 10, 4590. <https://doi.org/10.1038/s41467-019-12539-1>

²¹ Griscom, B. W. et al. (2017). Natural climate solutions. *Proceedings of the National Academy of Sciences USA*, 114, 11645–11650. <https://www.pnas.org/doi/full/10.1073/pnas.1710465114>

²² <https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement> The Paris Agreement is a legally binding international treaty on climate change – its goal is to limit global warming to well below 2, preferably to 1.5 degrees Celsius, compared to pre-industrial levels.

²³ Marselle, M.R. et al. (2021). Pathways linking biodiversity to human health: A conceptual framework. *Environment International* 150:106420. <https://doi.org/10.1016/j.envint.2021.106420>

²⁴ Public Health England (2020). *Improving access to greenspace - A new review for 2020*. March.

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/904439/Improving_access_to_greenspace_2020_review.pdf

Road investment to date has, arguably, focused primarily on minimising net detriment to biodiversity. The current Road Investment Strategy (RIS2)²⁵ sets an action to ensure “no net loss across Highways England’s activities in RP2 [Roads Period 2 - 2020-2025] and continue progress towards the target of delivering a net gain in biodiversity by 2040”. The current National Policy Statement for National Networks (NPS)²⁶ suggests that organisations applying for development consents may “wish to make use of biodiversity offsetting in devising compensation proposals to counteract any impacts on biodiversity which cannot be avoided or mitigated”.

There has been important legislative change since the NPS and RIS2 were published. The Environment Bill 2019 gained royal assent in autumn 2021, becoming the Environment Act 2021²⁷. We have now entered into a two-year transitional period for secondary legislation to be rolled out making Biodiversity net gain mandatory in relation to development for which planning permission is granted in England. This applies to the roads sector and points to a need for appropriate tools to be put in place and used.

The review and revision of the NPS and the process to establish the third Road Investment Strategy present a timely opportunity to rethink and promote a more proactive stance on biodiversity in relation to the management of the highways estate.

What would give us confidence that this issue is being addressed?

Strategic intent: Our impression is that the current approach to biodiversity and ecosystem management is piecemeal and generally a secondary consideration in road investment. We would like to see a strategic approach, at scale, that gives appropriate priority to biodiversity enhancement. Investment and maintenance practices should seek to maximise the biodiversity value generated from the extensive estates managed by highway authorities. Importantly this points to a proportion of road investment being devoted to schemes and programmes promoting biodiversity as a primary objective, including ongoing management of the soft estate. International best practice can and should be drawn upon - systematic conservation planning is used worldwide as a transparent and efficient approach for identifying and implementing the conservation and restoration of priority areas. For example, in South Africa it is used to inform all infrastructure development projects, based on reducing impacts on sites identified at the municipality-level to meet national-level targets²⁸.

Offsetting: Offsetting should be avoided when it involves rare or slow-growing habitat types, as it implies that these ecosystems are replaceable and interchangeable when, in practice, the loss of biodiversity and climate change mitigation benefits arising from a mature ecosystem, for example an area of ancient or veteran woodland, will not be recovered by new planting for many decades (if at all).

Transparency: As with other issues covered in this report, we would expect greater transparency on what data is being used, and why and how, to inform decision-making. Clarity on how different factors have been weighed in decision-making and who has been involved in making the decisions is important. Using a systematic conservation planning approach would facilitate such transparency and ensure the process was as robust as possible.

²⁵ <https://www.gov.uk/government/publications/road-investment-strategy-2-ris2-2020-to-2025>

²⁶ <https://www.gov.uk/government/publications/national-policy-statement-for-national-networks>

²⁷ <https://www.gov.uk/government/news/world-leading-environment-act-becomes-law>

²⁸ South African National Biodiversity Institute (SANBI) (2019). *National Biodiversity Assessment 2018: The status of South Africa's ecosystems and biodiversity*. Synthesis Report. South African National Biodiversity Institute, an entity of the Department of Environment, Forestry and Fisheries, Pretoria. pp. 1–214. <https://www.sanbi.org/wp-content/uploads/2019/10/NBA-Report-2019.pdf>

Health and social impacts

Q3 How can we be persuaded that the health and social impacts of road spending experienced by individual people and communities are well understood and given sufficient weight at all stages of decision-making?

We are concerned that...

- **the local benefits and disbenefits of road investment tend to be averaged out in appraisal at an area level but are experienced unevenly by constituent individuals and neighbourhoods such that investment showing an overall net benefit may disproportionately blight the lives of some individuals and communities who may not be adequately recognised or compensated**

We would like to see...

- **evidence that the detailed distribution and concentration of the benefits and detriments to health and livelihoods arising from road schemes experienced by individuals and communities are being identified and given appropriate weighting at every stage of decision-making**
- **evidence that claimed Social Value benefits, such as increased employment opportunities created by schemes, are realistic and accessible by the intended beneficiaries**
- **greater regard given to international practice, including latest World Health Organisation guidance**

Why is this important?

Spending on roads has a wide range of impacts on the health and wellbeing of individuals and communities. An incomplete list includes user benefits (such as time savings), noise, air quality, safety, security, severance, accessibility and affordability as well as benefits from the Social Value legacy of schemes, for example increased employment opportunities.

These impacts, positive and negative, are often unevenly distributed across the local population in the area adjacent to road projects. If our decision-making focuses only on net gains/losses across an affected area this can mask the very significant and highly concentrated disadvantages imposed on individual people and communities. For example, exposure to fine particulate matter (PM_{2.5}) may not appear significant at an area level but could lead to localised effects that may be severe for affected individuals.

This raises fundamental issues of social justice and fairness that, in the extreme, could extend to failing to comply with equalities legislation.

What would give us confidence that this is being addressed?

Granularity: We would like to see that analysis and appraisal addresses the impacts of road investment on people in the places they live and work at a sufficiently granular level so as not to mask such impacts by aggregation across an area, backed up by assurance to confirm that this is being given appropriate weighting in decision-making.

Integration: We would like to see more widespread evidence that health and social/community impacts of expenditure on roads, as well as the inequalities in their socio-spatial distributions, are being considered as early as possible in the decision-making process. Detailed consideration needs to begin well before the point at which a preferred scheme has been identified, otherwise the risk is that localised health and social impacts come to be regarded as a problem to be managed at the mitigation stage of project design. Health and social/community impacts should be an integral consideration throughout the decision-making process.

Upstream consideration of health and social/community impacts, as part of a robust problem definition and option selection process that includes effective engagement with local communities, offers a better way of demonstrating a genuine commitment to maximising the benefits of road investment and managing its negative impacts, and we suggest there are opportunities to draw from practices in Australia, Canada, the USA, Scandinavia and New Zealand to develop an improved approach to assessing health and social impacts as an input to this exercise.

Minimum thresholds: In relation to health impacts arising from factors such as noise and air quality, we would like to see the Government adopt the latest World Health Organisation guidance for minimum thresholds for human health²⁹ and ensure that assessment methodologies measure the exposure for individual people to these impacts. This would be a change to current practices that often models the impact on a receptor, such as a building, without sufficient attention paid to how it is used and by who, and could be implemented relatively swiftly by revising current standards and guidance, including the Design Manual for Roads and Bridges³⁰.

Social value: We have concerns about the quality and transparency of evidence for the claims of the Social Value legacy to be generated by projects. This can prevent us, and more importantly local people, from assessing their credibility. Where this information is available, we are worried that too much emphasis is placed on aggregate measures such as job creation, without sufficiently granular attention to such things as skills matches, unemployment levels and the types of jobs created, all of which shape whether and how the intended beneficiaries can access these opportunities.

²⁹ <https://www.who.int/tools/compendium-on-health-and-environment/environmental-noise>

³⁰ <https://www.standardsforhighways.co.uk/dmrb/>

Maintenance and optimisation

Q4 What would give us confidence that appropriate financial provision is being made for operating, maintaining and optimising the performance of the existing road network?

We are concerned that...

- **while the Road Investment Strategy process ensures that the maintenance of the strategic road network in England, as managed by National Highways, benefits from substantial committed funding and is subject to extensive scrutiny involving a degree of independent oversight, the same cannot be said for the vast majority of roads which are the responsibility of local highway authorities**

We would like to see...

- **assurance of a well-informed process leading to sufficient national and local highway maintenance spending across the entire network**
- **a funding framework for local highways that would provide for a better balance between managing near-term budgetary pressures and minimising whole-life costs**
- **greater attention given to how best to optimise the service we get from our road network, including the allocation of road space, in ways that are complementary to the delivery of planned maintenance activity**

Why is this important?

Together, our national and local roads represent a hugely valuable public asset developed over many decades. While projects to enhance, expand and remodel the network attract considerable attention, the ongoing need for adequate care and maintenance to preserve this value tends to slip below the radar, other than in the professional press or in the occasional flurry of interest in potholes. Yet the quality of the road surface - both the carriageway for vehicles and the footway for pedestrians - is important. It matters in the context of promoting active travel (walking and cycling), and the resilience of the network clearly needs attention in the face of the challenges posed by the implications of ever more extreme weather events. To pick one example, the increased risk of flooding affects accessibility where road and rail links are closed as well as harming homes and business premises.

This raises the question of what level of maintenance is appropriate for different types of road, in different locations, taking account of the future role each road needs to play - be that as a distributor for heavy commercial vehicles, an urban thoroughfare predominantly catering for walking, cycling and bus traffic, or a rural road connecting dispersed communities. It is also important to recognise that aside from the fabric of the highway, the modern road comes with associated lighting, street furniture and traffic control systems. Below the surface it often acts as a thoroughfare for a multiplicity of utility services such as electricity cables, water pipes, sewers and high-fibre broadband networks.

The process for creating a Road Investment Strategy for the period 2025-2030 is an important - and obvious - opportunity to address the level of funding needed to maintain the strategic road network (SRN) to an acceptable standard, recognising that these roads not only carry some of the heaviest traffic flows, in terms of vehicle numbers, but also accommodate much of the heaviest traffic, in terms of the nature of the vehicles themselves. Just under half of the £27.4bn allocated for the SRN in the second Road Investment Strategy (for the period 2020-2025) was earmarked for maintenance and renewals. But the existence of the Road Investment Strategy process begs a question about the adequacy of the way the funding requirement is assessed and allocated for other roads - the vast majority of the network by distance, comprising the carriageways and footways that we rely on being able to use every day.

Various reports paint a picture of a substantial, multi-billion pound maintenance backlog (over £12bn according to the latest Asphalt Industry Association ALARM Survey for England and Wales)³¹. The funding picture is complicated by the fact that capital (life-extending) and current (routine repairs and running costs) expenditure are sourced and treated differently, with English local authorities outside London benefitting from central government grants, but with a substantial and burgeoning squeeze on current expenditure arising from the need for local authorities to discharge their statutory social care responsibilities.

What would give us confidence that this is being addressed?

Informed decisions: The operating licence held by National Highways³² as a Government-owned company sets out the organisation's asset management responsibilities and National Highways has recently published further information on how it is discharging this role³³. Whether the Government's ultimate decisions on affordability as the third Road Investment Strategy is finalised will be consistent with the level of spending required to maintain the health and integrity of the network remains to be seen, not least in light of the increasing challenge of delivering resilience in the face of more extreme weather events. Nevertheless, when we combine the National Highways input on asset condition and future risks with the Department for Transport's consideration and the role of the Office of Rail and Road as Highways Monitor³⁴ we can at least see a process for generating an evidence-based, plausible maintenance spending profile and associated asset management plan.

The process for other roads lacks this degree of clarity and transparency. The good news is that fresh data sources are increasingly coming on-stream that should enable highway authorities to develop both a better real-time picture of their networks and an improved knowledge of underlying asset condition, for example data derived from 'connected' vehicles and from camera technology. These sources are also being explored by the Department for Transport (DfT) in order to develop a more accurate national picture of road condition, and to be able to track how well budgetary provision and the promotion of improved maintenance practices are feeding through into network condition. We see a strong case for redoubling the DfT's efforts to get a framework in place that better connects network condition, performance and spending need.

DfT's work - ideally to be steered by the UK Road Leadership Group (hosted by the Chartered Institution of Highways and Transportation)³⁵ - needs to tackle head-on the real

³¹ <https://www.asphaltuk.org/alarm-survey-page/>

³² https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/431389/strategic-highways-licence.pdf

³³ https://nationalhighways.co.uk/media/si2pi4yz/approach-to-asset-management_v_final.pdf

³⁴ <https://www.orr.gov.uk/monitoring-and-regulation/roads-monitoring/holding-national-highways-to-account>

³⁵ <https://www.ciht.org.uk/ukrlg/>

risk we are running by having a reported multi-billion pound maintenance backlog year-after-year. Are near-term budgetary pressures forcing a 'patch-and-mend' approach that is neither good for road users, nor optimal in securing minimum whole-life costs? To what extent is the desired performance consistent with a credible long-term funding scenario? And might the establishment of a 'spend-to-save' funding stream deliver a better long-term outcome, building on recent experience to encourage innovation in the development and implementation of zero carbon and climate change-focused local roads plans through the LiveLabs initiative³⁶?

This might necessitate some tough decisions about the quality of carriageway and footway we should expect at a time when public spending budgets look set to come under extreme pressure. If that is a conversation we need to have we would at least urge that everything possible be done to make that conversation well-informed.

Optimisation: We would like to see greater attention paid to optimising the performance of the existing network. Optimisation we take to refer principally to the proactive management of the flow of people and goods (as distinct from vehicles *per se*) to support economic and social activity and balancing this with addressing other goals discussed in this report including those concerning safety improvement and decarbonisation, some of which raise issues around the allocation of road space. Optimisation is also relevant to the scheduling of work, which, ideally would be integrated with asset maintenance and renewal.

We suspect more could be done to think ahead about the desired role and performance sought from specific roads in future, which may differ materially from that when they were first designed, including the possible development of performance indicators that might help inform the trade-offs that inevitably need to be made (for example between prioritising vehicle journey times versus prioritising the throughput of people and goods, or the safe use of roadspace to encourage more active travel).

Lateral thinking: A greater focus on optimisation would require new thinking from both National Highways and local highway authorities on the purpose of the different types of road under their stewardship, what that means for the level of maintenance users should expect in different locations and the exploration of new prioritisations, conditions and restrictions that might be placed on road use by different categories of users.

³⁶ <https://www.adeptnet.org.uk/livelabs2>

Safety

Q5 What would persuade us that options for investing in improving road safety are being identified and weighed appropriately?

We are concerned that...

- **too many lives are still being lost and life-changing injuries suffered on our roads**
- **we might not be spending the right amounts in the ways most likely to generate the best effects in terms of the greatest reduction in deaths and life-changing injuries**

We would like to see...

- **analysis that examines the make-up and extent of spending at the aggregate level that directly and indirectly addresses road safety risks**
- **much more attention given to ‘lead’ rather than ‘lag’ indicators across all roads - for example using increasingly available data sources (such as vehicle speeds and harshness of braking) to identify where and why safety risks are likely to arise and inform decisions on appropriate risk mitigations, while relying less on historic data (for example about individual crash locations)**
- **evidence of consideration being given to all available options (including infrastructure measures, regulation, and enforcement) to get the best returns for safety**

Why is this important?

In 2021, 1,558 people were killed on Britain’s roads - on average four people every day. In addition, recent national statistics for road casualties reveal a plateauing in the number of fatalities. This raises questions over whether and how further improvements in road safety can be achieved, and to what extent spending on the roads themselves should be part of the solution.

In 2021 road casualties showed signs of a return to pre-pandemic trends as traffic levels grew back. While the overall figures for 2021 were lower than pre-pandemic levels, over the second half of the year casualties returned to levels similar to those in 2019³⁷.

National Highways has a commitment to achieve zero harm on the strategic road network by 2040³⁸. A 2020 report by the Road Safety Foundation for the Office of Rail and Road

³⁷ <https://www.gov.uk/government/statistics/reported-road-casualties-great-britain-annual-report-2021/reported-road-casualties-great-britain-annual-report-2021>

³⁸ <https://www.gov.uk/government/publications/road-investment-strategy-2-ris2-2020-to-2025>

(ORR)³⁹ called for “urgent work to begin now generating a RIS 3 [third Road Investment Strategy] portfolio with high return safety investment” on the grounds that “‘business as usual’ can reasonably be expected to result in more than 1,000 people a year being killed or seriously injured on Highways England’s [now National Highways] network even in 2050, including more than 200 fatalities”. The need for a step-change is arguably even greater on the local road network which suffers from a level of serious crashes and fatalities per billion vehicle kilometres several times higher than for the strategic road network⁴⁰.

Bearing down on the toll of road-related deaths and injuries can also have wider benefits. As an example, making roads safer and making them feel safer is an important encouragement for more walking and cycling taking place.

What would give us confidence that this is being addressed?

Funding: Are we spending enough? The current trajectory of casualty reduction discussed above suggests not, and that without a change to business-as-usual there is a risk that the recent plateauing of the decline in deaths and serious injuries on our roads will continue. How much is being and should be spent remains, however, a complicated question. This is in part because project spend can encompass measures to enhance safety without safety being the primary objective. Indeed, improved safety might be a co-benefit or even an incidental benefit from, for example, a scheme to reallocate road space to encourage public transport and active travel. It has also long been recognised that safety improvements can come from education and enforcement as well as the engineering of the road and the vehicles used upon it.

We recognise that this is not easy to address, but could it be something that the ORR is specifically tasked with considering in relation to National Highways spending?

Risk assessment: Focusing, as this report does, on road spending, safety interventions have historically been developed for specific road locations in response to incidents and crashes, despite the fact that the specific location of a crash might not, in and of itself, be the primary or even a strong indicator of the underlying risk to future road safety at that location (or elsewhere). A more forward-looking approach would be one based both on assessing the risk factors inherent in the physical layout and engineering of a road alongside the known behaviour of road users. For example, locations where excessive vehicle speeds are observed but no casualties have yet resulted might still pose a high risk of a future casualty incident.

We understand that National Highways is seeking to embrace such a forward-looking approach through its use of the star rating protocol developed by the International Road Assessment Programme (iRAP)⁴¹. Our confidence would grow if we could see that highway authorities at all levels were adopting a similar approach based on lead rather than lag indicators, perhaps guided by advice from national government in England and the devolved administrations, and taking advantage of the ever growing range of data, including that derived from increasingly connected vehicles, which can reveal issues such as excessive speed and harsh braking.

Option identification: On option identification, a simple question emerged from our discussions: “are we considering all the available options to get the best returns for safety?”

³⁹ Road Safety Foundation (2020). *Review of how Highways England prioritises investments to improve safety outcomes*. A report prepared for the Office of Rail and Road. <https://www.orr.gov.uk/sites/default/files/om/Review-of-how-Highways-England-prioritises-investments-to-improve-safety-outcome.pdf>

⁴⁰ https://downloads.roadsafetyfoundation.org/2021_Report/Building_back_safer_GB_EuroRAP_results_2021.pdf

⁴¹ <https://nationalhighways.co.uk/media/3mya00pi/the-strategic-road-network-star-rating-report.pdf>

A second order question follows: “is there a risk that highway authorities, for entirely understandable reasons, tend to default to physical engineering solutions, when other options may offer better returns?”

One option for delivering road safety improvement is speed management. While National Highways and other authorities have sought to adopt the internationally-recognised Safe Systems model to support planning and decision-making in this area⁴², it is unclear how far the safe speeds pillar of the model is in practice being pursued, and if so whether it is with the same intensity as efforts directed towards safe roads and roadsides.

We feel that speed management is a potentially useful example for opening up a conversation about underused options. There is a well-established evidence base showing how speed management could play a role in reducing the incidence and severity of road crashes, with the associated benefits of improving traffic flow, potentially reducing the demand for new capacity, reducing emissions and improving air quality. It could also deliver more subtle benefits, such as improving the feeling of safety for some groups of road users, potentially improving the distributional impact of measures. We recognise that the development of interventions based on regulation and enforcement comes with its own challenges and can involve multi-agency co-operation.

While the prospect of enabling highway authorities to pursue moving traffic offences such as speeding could potentially reduce the historic reliance on enforcement through road policing and thus make speed management and the associated enforcement a more viable and cost-effective tool, it would require the building of an appropriate skillset and a budget for running costs.

To inform this conversation we suggest it would be desirable for the national administrations to gather and publish data to reveal the extent to which these considerations are being weighed more generally (perhaps, with a role for the ORR in respect of the National Highways network).

⁴² <https://nationalhighways.co.uk/media/npvmcrjg/putting-safety-first.pdf>

Consideration of alternatives

Q6 What would persuade us that road investment and expenditure decisions - at the scheme and programme level - are the result of serious consideration of a genuinely broad range of options and their merits?

We are concerned that...

- **the selection of which projects to implement may not be based on a sufficiently wide-ranging review of alternative options (including no-build or low-build solutions such as demand management) for meeting high-level objectives or resolving specific local issues**
- **problem/opportunity definition and selection of options to be assessed both risk being too constrained by organisational interests, siloed funding allocations, or simply adherence to established practice**

We would like to see...

- **evidence of decision-makers informed by and drawing on a wider range of expertise, experience and perspectives, from inside and outside the sector, at all stages of decision-making**
- **transparency of the processes through which options for schemes are narrowed down that demonstrates serious consideration being given to a broad range of possible solutions**

Why is this important?

Worries about the adequacy of consideration of alternative options for how to address an identified problem or opportunity have been a recurring theme of the Panel's discussions.

National and local government spends many billions annually in pursuit of resolution of problems or realisation of opportunities related to the road network. If we do not fully understand these problems/opportunities or fail to seriously consider a wide enough range of candidate options in response, we cannot be confident that we are spending this money effectively.

The Department for Transport's (DfT's) Appraisal Guidance (TAG) makes clear the importance of developing and assessing potential options in addition to testing the need for any intervention at all:

“It is important that as wide a range of options as possible should be considered, including all modes, infrastructure, regulation, pricing and other ways of influencing behaviour. Options should include measures that reduce or influence the need to travel, as well as those that involve capital spend. Revenue options are likely to be of particular relevance in bringing about behavioural change and meeting the Government's climate change goal”⁴³.

⁴³ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/938766/tag-transport-appraisal-process.pdf

However, we have a concern that what happens in practice may fall short of the intentions behind this guidance.

We recognise this is not easy. There has probably not been a sustained effort at the strategic level to promote the consideration of a wide range of alternative options since the Multi-Modal Studies⁴⁴ of the late 1990s.

The review of the National Networks National Policy Statement presents an important opportunity to recognise the significant and fundamental changes of circumstance that have arisen since production of the current version in 2014, and incorporate - and ensure (in line with TAG) - the exploration of alternatives to the addition of physical road capacity, and of the roles that could be played by land use planning, digital connectivity (in a society now substantially more familiar with this being integral to their lives and activities in work and play), improved integration across modes of transport, and demand management options.

What would give us confidence that this is being addressed?

Diversity of thought: The understanding of what constitutes a road problem or opportunity and what, in turn, constitutes a credible solution is, perhaps inevitably, at risk of a degree of group-think and adherence to historic practice. National Highways and local highway authorities draw on strong engineering and transport planning capabilities (in-house and external) to develop programmes of schemes, some of which have a lengthy history. To be sure of identifying the best options for addressing road problems/opportunities⁴⁵, an important prerequisite would be for the DfT, National Highways and other road decision-makers to find ways to access a wide range of thinking at all stages of the process that leads to the selection of a preferred option.

Processes: Diversity of thought is a necessary but not sufficient condition for better consideration of alternatives. Assessment and appraisal processes, funding arrangements and organisational remits also need to enable and accommodate alternative solutions to be identified, developed and weighed. It is important that National Highways demonstrates how it has drawn on a wide range of expertise and perspectives to develop the programme of schemes that will be incorporated into the forthcoming Road Investment Strategy, including how this has shaped the case for intervention and associated option generation. The same should apply to scheme promoters generally.

Another aspect of process we suggest is worthy of review is the extent to which the separation of funding into discrete budgeted programmes with their own rules and objectives obstructs the identification and pursuit of options that do not fit neatly within them. Could more flexibility usefully be created so as to allow highway authorities to spend more on areas perhaps not traditionally regarded as core road activity (see the chapter on biodiversity) or with other transport operators, building on the greater flexibilities that have been given to National Highways as the Government-owned company successor to the Highways Agency?

Transparency and scrutiny: Throughout the report we have returned to the theme of transparency, and this is important for consideration of alternative interventions. We would like to see scheme promoters adopt a default position of putting their data and methodology

⁴⁴ Shaw, J., Hunter, C. and Gray, D. (2006). Disintegrated Transport Policy: The Multimodal Studies Process in England. *Environment and Planning C: Politics and Space*, 24(4), 575-596. <https://doi.org/10.1068/c0567>

⁴⁵ In line with PAS 2080 whole life carbon in infrastructure management principles of build nothing, build less, build smart and build efficient- https://www.constructionleadershipcouncil.co.uk/wp-content/uploads/2019/06/Guidance-Document-for-PAS2080_vFinal.pdf

into the public domain so that stakeholders can see how and why decisions have been made and so that independent scrutiny can be applied.

Good consideration of alternatives is so fundamental that we believe there is a strong case for an increase in independent scrutiny, proportionate to the size and impact of the strategy or scheme involved, perhaps akin to that involved in the Wales Road Review⁴⁶, where an independent process has been established and applied to consider how and why schemes were originally selected as options and whether or not the rationale still stands in light of current policy positions and priorities informed by changed circumstances.

This could also help address a concern that ran through our discussions about the potential conflict of interest arising from the dual responsibilities of asset owners both to carry out appraisals and act as scheme promoter for their preferred option.

⁴⁶ <https://www.gov.wales/roads-review-panel>

Robustness of investment decisions in a changing world

Q7 What would persuade us that road investment and expenditure decisions are likely to represent value for money over the long term?

We are concerned that...

- **the decision-making process may not be engaging sufficiently with uncertainty about the future and therefore lacks robustness to the possibility of changed circumstances (for example the nature, extent and severity of climate change effects, or anticipated developments failing to materialise or being delivered later than expected)**

We would like to see...

- **testing of investment decisions against a wide range of plausible scenarios (including those that involve reductions in traffic volumes and step changes in sustainable and active travel)**
- **greater openness about the work that has been done to test options for their robustness against future scenarios, and a willingness to revisit this assessment at key stages of scheme development**
- **evidence of portfolios of smaller interventions with a lower risk profile being given serious consideration (including those aimed at reducing travel demand)**

Why is this important?

The consequences of road investment play out over many decades, especially in relation to infrastructure-based capacity enhancements. This makes it inevitable that the forecast benefits are vulnerable to changing circumstances (as they are in other sectors). While uncertainty is a subjective notion, reflecting the extent of confidence in knowing how and why change occurs, it is broadly recognised that the sense of uncertainty is deep. Indeed, in its 2018 National Road Traffic Forecasts report⁴⁷, the Department for Transport (DfT) acknowledged that “[w]hile uncertainty in road traffic demand has always existed, it is perhaps now more uncertain than ever given the changes that are currently being experienced in the system and the changes that could lie ahead”. This was before the pandemic. DfT released its new National Road Traffic Projections in December 2022⁴⁸, again acknowledging that “[t]here is considerable uncertainty around future travel demand”. Decision-makers need to engage seriously with uncertainties around factors such as technology change, economic geography, and demographics to ensure that their choices have a fighting chance of representing value for money over the long term.

Arguably, this becomes even more important if we want to move from a reactive ‘predict and provide’ approach based on accommodating forecasted traffic growth to a more proactive

⁴⁷ <https://www.gov.uk/government/publications/road-traffic-forecasts-2018>

⁴⁸ <https://www.gov.uk/government/publications/national-road-traffic-projections>

‘decide and provide’ stance⁴⁹ that looks to use road investment proactively to achieve the wider range of objectives that we have discussed in this report relating to environmental, social and economic outcomes. Decide and provide is vision-led rather than forecast-led, but much of what shapes the future in uncertain ways is beyond the immediate influence of road investment itself. Accordingly, investment decisions are needed that are as robust as possible to a range of different possible futures⁵⁰.

We welcome the fact that this is starting to be addressed with the DfT’s Uncertainty Toolkit⁵¹. This includes a series of seven ‘Common Analytical Scenarios’ (CAS) intended - where considered proportionate to do so - to be used to assess how a proposed scheme performs in terms of value for money in the face of different possible futures. It is too early to judge whether and to what extent use of the toolkit actually shapes decision-making based on scenarios capturing a broad enough range of possible futures.

What would give us confidence that this is being addressed?

Changing practice: The arguments against predict and provide are not new and the creation of the CAS is a welcome effort to move away from business-as-usual appraisal in which a central (sometimes referred to as ‘most likely’) forecast coupled with sensitivity testing has guided decision-making. However, we recognise that this is an emergent new approach and one that has yet to become common practice. As such we are concerned that a significant proportion of investment decisions - including some major capital capacity enhancement schemes - have been and are still being made in the absence of scenario testing, casting doubt upon the robustness of such decisions. We would like to see assurance that steps are in place to rapidly bring about change in practice and would ideally wish to see this extended - in a proportionate manner - to a review of schemes yet to be implemented that have previously been appraised without such testing.

Future possibility: None of the DfT’s current seven CAS describe a future in which traffic volumes fall. We consider this surprising given our earlier examination of the possibility of this being necessary to assure compliance with our national decarbonisation obligations (in the round, taking account of the risks applying to sectors other than road transport and the likely rate at which road traffic itself is decarbonised). We would argue that two very plausible scenarios should be substituted or added to the CAS: (i) road traffic reducing as a consequence of positive policy interventions and initiatives such as those already being pursued across the country to promote sustainable and active travel, repurpose road (carriageway) space, and limit motor traffic access to town and city centres (e.g. through traffic and parking management measures); and (ii) road traffic reducing based on a climate-related acceleration of extreme weather conditions disrupting and constraining transport should global efforts to decarbonise fail to achieve the necessary downward trajectory (bearing in mind the appraisal periods for projects now in development will run almost to the end of the century).

Thereafter we would also recommend a periodic evaluation instituted to review the continued appropriateness of the CAS, including examination of whether the CAS and their use offer

⁴⁹ Lyons, G. and Davidson, C. (2016). Guidance for transport planning and policymaking in the face of an uncertain future. *Transportation Research Part A: Policy and Practice*, 88, 104-116. <http://dx.doi.org/10.1016/j.tra.2016.03.012>

⁵⁰ Lyons, G. and Marsden, G. (2021). Opening out and closing down: the treatment of uncertainty in transport planning’s forecasting paradigm. *Transportation*, 48, 595-616. <https://doi.org/10.1007/s11116-019-10067-x> and ITF (2021). *Travel Transitions: How Transport Planners and Policy Makers Can Respond to Shifting Mobility Trends*. ITF Research Reports, OECD Publishing, Paris, 52-69. <https://www.itf-oecd.org/travel-transitions-policy-makers-respond-mobility-trends>

⁵¹ <https://www.gov.uk/government/publications/tag-uncertainty-toolkit>

enough to test both an investment's sensitivity to changes in a single factor (e.g. household formation) and that investment's robustness to radically different futures.

Transparency and scrutiny: As with so many other issues covered by this report, we would welcome greater openness and transparency, in this case to reassure us that decision-makers are using scenarios or other methods to engage seriously with uncertainty. This could be as simple as routinely publishing the assumptions against which potential solutions have been assessed, and how those solutions fared against different scenarios. The long gestation period of many schemes also makes us believe that there could be a role for a repeated - potentially independent - check of the continuing robustness of a preferred solution at key stages of the development process, proportionately applied. This would allow decisions to be made in light of an understanding of how uncertainties have developed or abated, as well accommodating policy-driven changes to the strategic objectives that the scheme was originally designed to meet. For major schemes it may seem obstructive to re-examine the case, and yet if circumstances have significantly changed, assurance in the robustness of substantial public expenditure is surely merited.

Portfolio approaches: Larger schemes or interventions while potentially providing greater benefits are also inherently more risky. A well-selected portfolio of smaller investments may offer a better means of achieving our goals in a way that is less vulnerable to uncertainty. We would welcome evidence that this approach is being actively considered in the process for the third Road Investment Strategy.

Conclusions

This report identifies seven high-level questions that are intended to be a source of provocation and constructive challenge for anyone with a role or interest in the future of road investment and expenditure.

We believe that if decision-makers can provide robust answers to these questions they will be in a much stronger position to deliver better outcomes economically, socially and environmentally, and to do so with greater confidence. We would emphasise that these are not necessarily the only matters for further consideration, but are those where we feel as a Panel there is currently cause for concern and in turn action.

In addition five themes repeatedly surfaced through the course of our discussions:

- the need for improved **transparency** to allow scrutiny of decisions and the associated trade-offs, including a greater willingness to share any underpinning analysis⁵²;
- a need for a more clearly **coherent** approach to decisions, which recognises road investment's role as an enabler of other objectives and which ensures that decisions are demonstrably consistent with broader obligations, including statutory requirements in areas such as decarbonisation and biodiversity;
- a wish to see that individual schemes are fully and proportionately **compliant** with evolving procedural obligations and standards, such as those set out in HM Treasury's Green Book;
- a need to ensure that decision-making is well-informed and draws upon a wide and diverse range of expertise and perspectives (including non-transport specialists); and
- a sense that all of the above could be well-served by a greater role for **independent scrutiny** of decision-making, in particular where it falls to scheme promoters to amass evidence and generate a business case for the preferred option.

Developing a strategy for investing in roads points to the prior importance of having a clear set of overarching objectives that enable the service that we wish our roads to perform to be set within, and in clear support of, a bigger picture.

Our report has signposted a number of initiatives in flight that we believe make our observations timely, most obviously the refresh of the National Networks National Policy Statement and the third Road Investment Strategy.

The Panel discussed whether the concerns raised in this report warrant a call for a pause to decision-making, particularly in respect of new schemes that would accommodate material growth in motor traffic (while recognising that other spending to keep the road network serviceable would continue). Time for reflection and reassessment is, however, constrained. The Panel recognises that for the National Highways network (as for the railways) the Government is bound by statutory timescales, in this case for completing the Road Investment Strategy. The Panel also recognises that uncertainty is no friend to investment planning, nor to a supply chain already wrestling with inflationary pressures.

This does not, however, take away the pressing need to engage with the questions that the Panel has raised - and in particular the tension between adding any new capacity to the network at the same time as staying within the carbon reduction trajectory needed to meet

⁵² We are obliged to note here the Freedom of Information request from Professor Greg Marsden to the Department for Transport for release of data that underpins the Transport Decarbonisation Plan. This request was supported by the Information Commissioner's Office but was subsequently appealed against by the Department for Transport at the end of 2022.

the Sixth Carbon Budget (as reflected in the Department for Transport's Transport Decarbonisation Plan).

Recent experience with the halting passage of schemes through the Development Consent Order process and the time and effort involved in generating responses to legal challenges suggests to the Panel that time could be saved, rather than lost, by engaging rapidly with the questions we have identified. Doing so could, we believe, fit in part if not fully within the Road Investment Strategy timetable, which runs out until 2024-5 (and covers far more than the high-profile programme of capacity enhancement projects that the Government wants National Highways to pursue). The extent of flexibility on timetable (and steps therein) within legal parameters and what is administratively feasible would need closer examination.

It follows that we recommend, as set out in the chapter on decarbonisation, that the Government should:

- (i) publish a projection of the change in vehicle miles by carbon-emitting vehicles necessary or prudent to stay within an acceptable carbon reduction trajectory (recognising that this will have to be carried out against an uncertain cross-sectoral backdrop);
- (ii) indicate with sufficient confidence how such change can be achieved in practice in the required timescale (recognising that time is getting very short for fresh measures to be developed and implemented); and
- (iii) make this analysis available as the basis for decisions on individual capacity-increasing road schemes.

We also recommend that this analysis should then be applied as part of the approval process for capacity-increasing schemes still in their pre-construction development phases (i.e. before contracts have been signed for the commencement of work), including schemes in the second Road Investment Strategy, schemes being developed for possible inclusion in the third Road Investment Strategy and thereafter, and major schemes developed by local authorities.

Such analysis and its scrutiny should not displace or detract from the need for attention to be given to the questions we have highlighted beyond decarbonisation - we commend them to those responsible for the spending decisions that will shape the condition and performance of our roads - nationally and locally - for many years to come.

The Panel recognises that engagement with the questions we have surfaced could take different forms and we are very open to discuss how best to proceed.

Glenn Lyons and Steve Gooding, who took a leading role in the Panel in their capacities as Professors at the University of the West of England (UWE Bristol), would like to thank the Trustees of the Rees Jeffreys Road Fund for their grant to UWE Bristol's Centre for Transport & Society that made this project possible. Considerable thanks also go to all members of the Road Investment Scrutiny Panel and to its Secretary for their commitment and diligence.

If you wish to cite this report, please do so as follows:

Road Investment Scrutiny Panel (2023). *Key questions for road investment and spending*. A report prepared with support from the Rees Jeffreys Road Fund, University of the West of England, January. <https://uwe-repository.worktribe.com/output/10295773/>



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