



transport for quality of life

Response to Transport Select Committee Call for Evidence: Strategic Road Investment February 2023

Summary

This submission provides evidence to address the following question posed by the Committee:

Whether the Government's roads investment programme aligns with other policy priorities, such as decarbonisation, levelling up, productivity and growth?

Decarbonisation

- Our analysis suggests RIS2 is not consistent with UK carbon targets.
- DfT's analysis of the carbon impacts of RIS2 underplays the carbon impact in a way that might be considered misleading.
- None of the scenarios in DfT's 2022 National Road Traffic Projections are consistent with CCC's carbon reductions for surface transport or the DfT's own Transport Decarbonisation Strategy.
- There is no allowance in the National Road Traffic Projections for the impacts of climate change.
- DfT's decarbonisation strategy for cars in 2030 is not aligned with the CCC's net zero pathway.

Levelling up

- The ambitions for public transport in the Levelling Up White Paper are welcome.
- It is not clear that investment in roads increases economic activity or spreads opportunity across the UK or that these benefits could not be achieved by other means.
- Wales offers a useful model for collaborative working to support levelling up.
- Funding for trunk road investment risks undermining levelling up.

Productivity

- There is little empirical evidence that road investment increases productivity.
- We believe the case for investment in public transport to boost productivity is stronger.
- Analysis suggests poor public transport may be the reason British cities lag on productivity compared to similarly sized European cities.

Growth

- Our analysis of National Highway's reports shows the evidence of economic impacts from road schemes is limited and weak.
- Other comprehensive reviews have found little or mixed evidence of the local economic impact of road schemes.

Response to Transport Select Committee Call for Evidence: Strategic Road Investment January 2023

This submission provides evidence to address the following question posed by the Committee:

Whether the Government's roads investment programme aligns with other policy priorities, such as decarbonisation, levelling up, productivity and growth?

Decarbonisation

Our analysis suggests RIS2 is not consistent with UK carbon targets

In 2020, Transport for Quality of Life undertook an analysis of the potential carbon impact of the RIS2 programme, in the absence of any published government figures¹. The analysis used National Highways (NH, then Highways England) own figures from every published post-opening project evaluation of a strategic road scheme built over the last 18 years, and every Environmental Statement for a planned RIS road scheme publicly available at the time. Our estimates took account of embodied carbon (from materials used in road construction), carbon emissions from higher speeds, and carbon emissions from induced traffic. Our report noted that NH measures some of these impacts but that post-opening project evaluations have systematically underestimated the effect of induced traffic².

We estimated that total cumulative **additional emissions** between 2020 and 2032 as a result of RIS2 may be about 20 MtCO₂. This estimate includes allowance for improved vehicle efficiency over time, as the proportion of electric vehicles increases. Emissions could be higher than this if planning policy becomes more permissive, allowing more out of town, car-dependent development. This increase in CO₂ from RIS2 will negate 80% of potential carbon savings from electric vehicles on the SRN between 2020 and 2032.

This estimate suggests that RIS2 is not consistent with the legal obligation to cut carbon emissions in line with the Paris Climate Agreement, the Climate Change Committee budgets and the DfT's decarbonisation plan.

DfT's analysis of the carbon impacts of RIS2 underplays the carbon impact in a way that might be considered misleading

Some statements by DfT about the carbon impact of RIS2, including figures provided to Parliament, underplay the carbon impact in a way that might be considered misleading. For example on 20 July 2020, in response to a Parliamentary Question from Caroline Lucas MP (tabled 14 July 2020) the Secretary of State Rachel Maclean MP stated that the "additional [cumulative] effect of new RIS2 schemes will be around 0.27 MtCO₂e up to the end of 2032"³. It subsequently became clear that this figure was based on only 5 RIS2 schemes⁴, as DfT argued the majority of RIS2 schemes were carried over from RIS1 and therefore their emissions had already been accounted for. This denies the reality that (a) RIS1 cumulative carbon emissions have never been properly assessed; (b) regardless of whether a particular scheme was included in RIS1, if it has not yet been built, its carbon impact is still avoidable; (c) Environmental Statements for some large RIS2 schemes (such as Stonehenge and the Lower Thames Crossing) suggest that they will cause millions of tonnes of carbon emissions over their lifetime.

Transport Action Network estimated that the DfT figure of 0.27MtCO₂e took account of emissions from only 90 of 4,000 miles of road construction proposed in RIS2.⁵

Further, it is essential that the carbon consequences of road building and use explicitly includes allowance for the real characteristics of vehicles (including changes in the weight and size of vehicles, remaining emissions by hybrid vehicles, recognition that electricity supply is itself still partly carbon-based, and a substantial acceleration of the market for electric vehicles will involve significant emissions of carbon from vehicle manufacture).

None of the scenarios in DfT's 2022 National Road Traffic Projections are consistent with CCC's carbon reductions for surface transport, or the DfT's own Transport Decarbonisation Strategy

In December 2022, the government published the 2022 National Road Traffic Projections (NRTP) and accompanying carbon emissions for a number of scenarios⁶. In all scenarios, the predicted reduction in carbon emissions from traffic is less than the necessary reduction in surface transport emissions that is assumed in the Climate Change Committee's (CCC) 6th Carbon Budget. The Climate Change Committee's 6th Carbon Budget requires a 47% reduction in carbon emissions from surface transport between 2018 and 2030, while the eight NRTP scenarios predict carbon emissions from road transport over this period will fall by only 19-35%. The RIS2 programme will therefore add significant carbon emissions during a period in which surface transport emissions are not falling fast enough to be aligned with carbon budgets.

These 'scenarios' are based on 'committed and funded' policies and projects and therefore only include partial and incomplete information about the effects of the Transport Decarbonisation Strategy itself on the traffic levels and conditions planned for. In particular, there is no scenario yet tested and reported which would achieve the stated intention to increase the proportion of all urban trips by walking and cycling to 50%, increase the proportion by public transport, and reduce urban traffic significantly, and reduce, or at least stabilise, traffic more widely. We do not know whether this absence is a prelude to dropping these policy intentions, or simply waiting for the results of work currently in progress, but our own work certainly suggests that an overall reduction in traffic levels is an essential component of achieving carbon objectives.

There is no allowance in the NRTP for the impacts of climate change

None of the projected scenarios in the NRTP allow for any worsening of climate change – ie they all assume essentially the same weather and operating conditions as today. DEFRA has recommended that all major project and policy appraisal allows for the possibility of a 2°C or 4°C increase in global average temperature. This would change the location, conditions and quantity of travel on a large proportion of the strategic and local road networks, requiring changes in design and operational management, including flexible infrastructure and the ability to cope with more frequent emergency movements. All road planning must make allowance for the impacts of climate change as a priority.

DfT's decarbonisation strategy for cars in 2030 is not aligned with the CCC's net zero pathway

The DfT has recently provided some of the assumptions behind their Transport Decarbonisation Plan⁷. The DfT's plan includes a chart (Figure 2 in the plan) of domestic transport greenhouse gas emission projections for 2020 to 2050 versus a baseline⁸. This chart shows a fuzzy wide band of projections with a large range of emissions for any given year. It has never been clear what assumptions this chart was based on, and whether it was aligned with the Climate Change Committee's (CCC) Net Zero Pathways from the 6th Carbon Budget. It is difficult to compare the two because the DfT's chart is for domestic

transport (including domestic aviation and shipping) while the CCC’s pathway is for surface transport. However given that cars generate the majority of emissions for both domestic and surface transport we have compared the assumptions for cars behind the DfT’s plan and the CCC’s Net Zero Pathway in Table 1 below.

Assumption	CCC Net Zero Balanced Pathway	DfT’s lower bound in the TDP	DfT’s upper bound in the TDP
Car mileage in 2030 (billion vehicle km)	453	352	547
% mileage that is ZEV in 2030	34%(a)	47%	30%

(a) Strictly this is the % of cars on the road that are assumed to be Battery Electric Vehicles in 2030.

This shows that DfT’s upper bound assumptions for car mileage is higher and the percentage of car mileage that is driven by Zero Emission Vehicles (ZEV) is lower than the CCC’s assumptions. This suggests that the upper bound of DfT’s projections for cars in 2030 is not aligned with the CCC’s Net Zero Pathway. However, the DfT should be adopting urgent measures to ensure that emissions from cars are kept below the CCC’s Net Zero pathway, and not doing anything to risk increasing emissions, such as increasing road capacity.

Levelling up

The ambitions for public transport in the Levelling Up White Paper are welcome

The ambitions for transport infrastructure in the Levelling Up White Paper are welcome. Mission 3 states: *“By 2030, local public transport connectivity across the country will be significantly closer to the standards of London, with improved services, simpler fares and integrated ticketing.”*⁹

To achieve Mission 3 will require significant additional investment around the country in public transport infrastructure and services as well as changes in governance to achieve a properly integrated public transport system.

The White Paper cites transport settlements in 8 city regions for bus and active travel funding, and additional funding for rail. There are many references to local transport (particularly buses) as well as low carbon and green public transport.

It is not clear that investment in roads increases economic activity or spreads opportunity across the UK or that these benefits could not be achieved by other means

Investment in roads is mentioned in the White Paper in relation to improving connectivity between economic centres, focussing on areas where connectivity is weak:

“For roads, the UK Government will accelerate delivery of the A66, ensuring that it is open for traffic five years sooner than the original plan. The UK Government will also progress work on the A428, A417 and A12.”

However, evidence is not provided to show that delivery of these roads is an effective means to increase economic activity, or to spread opportunity more equally across the UK, or that this ‘connectivity’ could not have been achieved by alternative means, such as investment in rail. In any case, to the extent that expansion of road space does increase economic activity, so also the increase in traffic congestion envisaged in the high growth of traffic will result in a reduction of economic

activity, since there is no effective way of increasing capacity enough to outpace the projections with high growth of traffic.

Wales offers a useful model for collaborative working to support levelling up

In Wales, a study commissioned by the Future Generations Commissioner examined whether there were alternatives to a major road scheme, the M4 relief road south of Newport, and concluded that there were¹⁰. This led to a Welsh Government decision not to proceed with the M4 relief road. A Commission was set up, chaired by Lord Burns, to investigate alternative measures to reduce congestion on the M4. The Commission recommended a comprehensive 'network of alternatives', including enhancements to the South Wales Mainline railway, frequent stopping services, and five new stations; better connections between rail and bus services; a rapid bus corridor and continuous commuter cycle routes between Cardiff and Newport. The Commission's recommendations were endorsed by the Union Connectivity Review chaired by Sir Peter Hendy, and the UK Department for Transport has provided funding for technical studies to develop the rail enhancements. Welsh Government, Transport for Wales and the three local authorities are working together to take forward the other recommendations of the Burns Commission¹¹. This offers a useful model for collaborative working between national and local government to develop transport schemes that support the 'levelling up' agenda.

Funding for trunk road investment risks undermining levelling up

By contrast, earmarking of funding solely for trunk road investment risks undermining the levelling up agenda by reducing the funding available for multimodal public and active transport investment. By making it easier/faster to drive, road investment reduces the incentive to use more sustainable alternatives and may thus also undermine the business case for these alternatives.

As well as RIS2 and RIS3, substantial government and local authority funding is being allocated to local authority roads via:

- a Major Road Network programme and a Large Local Majors programme (around £3.5 billion between 2020-2025)
- the Housing Infrastructure Fund (around £1.8 billion between 2018-19 and 2023-24)
- road schemes funded via Local Enterprise Partnerships.

The design, development and implementation of these schemes uses up scarce local authority capacity and funding, which could otherwise be used to boost public transport services and infrastructure. As with RIS2, this may hinder rather than help the levelling up mission.

3. Productivity

There is little empirical evidence that road investment increases productivity

Increased productivity is often used as a rationale for new roads. Although there are a lot of theoretical studies on this, there is relatively limited empirical evidence that road investment increases productivity in countries with well-developed road networks, such as the UK. National Highways does not evaluate the effect of road schemes on productivity within its post-opening project evaluations¹².

A review of the economic benefits of strategic road investment by Frontier Economics for DfT acknowledged that *"One of the strongest conclusions that can be drawn from the review of existing case studies is that there is a limited amount of robust evaluation evidence on the economic impacts of specific roads investment projects. While the study of traffic, safety and other transport-specific outcomes is very well developed (such as in Highways England POPE studies), most evaluations make*

no attempt to robustly and quantitatively assess the impact of projects on employment, productivity, trade, or other economic outcomes”¹³. The same study concluded that “Across the wider evidence base, a particular gap relates to the lack of evaluation evidence on the impacts on economic performance of long-distance intercity road investments. This is of course particularly important given the context for this study to inform the Road Investment Strategy.”

A study by Onward, which used a different measure of connectivity to official sources, found that access to jobs by car is not at all related to income (and productivity) and that differences in income are better explained by qualification levels and the mix of occupations and industries¹⁴. They conclude that *“further transport investments won't do much to improve incomes and living standards in a place without addressing other economic fundamentals like education and the quality of jobs available.”*

While some studies have identified some productivity benefits in areas in Britain with better road networks relative to others, they acknowledge these effects are ‘quite trivial’ compared to the impacts found in developing countries with less developed road networks¹⁵. They also conclude that there are decreasing returns on investment in road infrastructure as the stock of infrastructure increases.

We believe the case for investment in public transport to boost productivity is stronger

In our view, the case for investment in public transport to boost productivity is stronger. Evidence from the Centre for Cities, cited in the Levelling Up White Paper, suggests that *“[poor] public transport in UK cities may limit productivity by reducing effective density and, as a result, agglomeration.”¹⁶* If this is the case, targeting investment to tackle the deficiencies in city transport systems might be expected to have significant benefits for productivity.

While any improvement in transport that moves people more easily to a given place could provide agglomeration benefits, public transport is likely to be particularly effective because it moves people so efficiently i.e. it requires less land-take than road investment to move a given number of people. In particular, the reduced need for parking creates more space for productive uses. If the main means of access to an employment centre is by car, induced traffic will eventually cause congestion and hinder growth. But if the employment centre is near to a train station, light rail stop or bus station, more people will be able to access it, promoting clustering and ultimately increases in productivity.

Evidence pointing to the agglomeration benefits of public transport investment includes:

- A study of Crossrail in London, which suggested the agglomeration benefits of the scheme added 25% to the benefits of the project¹⁷.
- Investment in light rail was reported to be instrumental in the relocation of the BBC to Salford, which catalysed the successful regeneration of Salford Quays, which is now a key cluster for media and digital industries¹⁸.
- A 2014 study which found that a 10% increase in public transport in US cities, by adding rail or bus seats or rail miles, was associated with an increase in average wages for city centre workers equivalent to a 1-2% increase in Gross Metropolitan Product (GMP) per capita¹⁹. Scaled up by population the benefits of public transport could be worth anywhere from \$1.5 million to \$1.8 billion (roughly £1.3 million to £1.6 billion) a year per city.

Analysis suggests poor public transport may be the reason British cities lag on productivity compared to similarly sized European cities

The study by Onward found that *“weak connectivity may be holding back growth in specific parts of the UK”* and more specifically that *“several second-tier cities are badly let down by their internal public*

transport infrastructure". It suggests that some areas, particularly in the north, would benefit from public transport investment²⁰.

In large developed countries, bigger cities are generally more productive than smaller cities due to agglomeration, but this does not seem to be the case in the UK. Data analyst Tom Forth suggests that poor public transport in Birmingham and many other UK cities makes their effective size smaller, and reduces the agglomeration benefits that would be expected from their population²¹. Unlike many European cities which have extensive rail and light rail networks as well as better bus services, the UK's cities outside London are poorly served by public transport. For example there are only 9 light rail/tram networks in Britain (7 outside London) compared with 49 in Germany, 28 in France, and 15 in Poland²².

Forth's analysis looked at the public transport journey times on buses and trams into central Birmingham at peak times. He used 30 minutes as the travel time by bus or tram to mark the boundary of the Birmingham agglomeration (which doesn't include walking or waiting time). At off-peak times a person 5 miles from Birmingham is part of the Birmingham agglomeration, while at peak times, this reduces to just 3.5 miles. He suggests this reduces the effective population of Birmingham by nearly half and may explain why Birmingham and other British cities seem to lag behind the productivity of similarly sized European cities. Forth's paper concludes *"If we assume that agglomeration benefits in the UK are as significant as in France, this would lead to an increase in GDP/capita of 7%."*²³

Growth

Our analysis of National Highway's reports shows the evidence of economic impacts from road schemes is limited and weak

In 2017, Transport for Quality of Life reviewed National Highways (then Highways England) own Post Opening Project Evaluation (POPE) reports to understand whether road schemes that had been justified prior to construction on the basis of their expected impact on growth of the economy had delivered the anticipated benefits²⁴.

At the time of our study, Highways England had published post-opening project evaluations of a total of 86 road schemes, of which 25 had an objective relating to stimulus of the local or regional economy. Of these 25 schemes, we found that five had moderate evidence of a relationship between economic development and the scheme; for the remaining 20 we concluded on the basis of the post-opening project evaluation that there was either no evidence of economic impact, weak negative evidence, or anecdotal evidence. Even for the five schemes with moderate evidence, the economic effects may have arisen from changes incidental to the road scheme, or involved development in an inappropriate location, or involved changes that were as likely to suck money out of the local area as to bring it in.

Where a road scheme was justified on the basis that it would support regeneration of an area with a struggling economy, it was common for economic development following completion of the road scheme to be slower than expected, or not to materialise at all, or to be of a type which offered little benefit to the area concerned. For example, this was the case for schemes such as A249 Iwade – Queenborough Improvement; A63 Melton Grade Separated Junction; A63 Selby Bypass; M1 J25-28 Widening; and A500 City Road and Stoke Road Junction Improvement.

Where a road scheme was justified on the basis that it was needed to cater for current and future traffic in a 'pressure cooker' area with a buoyant economy, it was common for the scheme to be followed by much development in car-dependent locations, causing rapid traffic growth and congestion on both the road scheme and the pre-existing road network.

Some road schemes were justified on the basis that by reducing journey times, they would increase the number of jobs that were accessible to local people, or increase the potential workforce able to

access major employment sites, or create thousands of new jobs. There was no evidence of measurable economic benefit from these schemes.

Thus, the evidence from post-opening project evaluations that past road schemes have supported economic growth is limited and weak.

Other comprehensive reviews have found little or mixed evidence of the local economic impact of road schemes

In a comprehensive meta-analysis, the What Works Centre for Local Economic Growth reviewed around 2,300 evaluations of the local economic impact of transport projects from the UK and other OECD countries, and found only 17 robust studies of the effect of road schemes on the local economy²⁵. There was only one study from the UK, with 11 from the USA and the remainder evaluating programmes in Spain, Portugal, Hungary and EU-wide. Key findings of the review were that: (a) roads can positively impact local employment, but effects are not always positive and a majority of evaluations show no (or mixed) effects on employment; (b) road projects may increase firm entry, although not necessarily the overall number of businesses (as new entrants may displace existing firms).

This leads us to the view that road investment is not necessarily a particularly effective means to support local economies, and the evidence about the effect of road schemes on economic growth is perhaps less strong than is sometimes assumed by policy makers. To the extent that the RIS2 programme reduces the funding available for other priorities, it may not be the best way of achieving government policy priorities with regard to economic growth.

Transport for Quality of Life

February 2023

www.transportforqualityoflife.com

Endnotes

- ¹ Sloman L and Hopkinson L (2020) [The carbon impact of the national roads programme](#). Report by Transport for Quality of Life. July 2020
- ² Due to failings in the way it evaluates road schemes (using a method categorised as ‘weaker / riskier’ in the government’s own evaluation ‘rulebook’, the Magenta Book)
- ³ Maclean R (2020) [Roads: capital investment](#). Response from Rachel Maclean MP to written question from Caroline Lucas MP. UK Parliament website. Question asked 14/07/20, answer provided 20/07/20.
- ⁴ The Secretary of State for Transport (2020) [Defendant’s Skeletal Argument](#) in High Court case between The Queen (on the application of Transport Action Network) and The Secretary of State for Transport and Highways England Company Ltd. Filed 14 June 2021, posted on TAN website.
- ⁵ <https://transportactionnetwork.org.uk/campaign/legal-action/ris2-legal-action/>
- ⁶ Department for Transport (2022) [National Road Traffic Projections](#). Dec 2022.
- ⁷ Warren N (2023) [Traffic Level and Electric Vehicle Assumptions used in Decarbonising Transport: A Better, Greener Britain](#). Response from Nathan Warren, DfT, to a Freedom of Information request from Professor Greg Marsden, on WhatDoTheyKnow website. Posted 12/01/23.
- ⁸ Department for Transport (2021) [Decarbonising Transport. A Better, Greener Britain](#).
- ⁹ Department for Levelling Up, Housing and Communities (2022) [Levelling Up the United Kingdom](#). Feb 2022.
- ¹⁰ The Future Generations Commissioner for Wales, the Centre for Transport and Society (CTS), University of the West of England, Sustrans and New Economics Foundation (2018) [Transport Fit for Future Generations](#). September 2018.
- ¹¹ Transport for Wales. [The Burns Delivery Unit](#). Webpage, undated.
- ¹² National Highways (2022) [POPE Methodology Manual: post-opening project evaluation for major projects](#)
- ¹³ Frontier Economics Ltd (2017) [Exploring the economic benefits of strategic roads](#) Report for DfT and Highways England
- ¹⁴ Blagden J and Tanner W (2021) [Network effects. Why levelling up demands a new approach to connectivity](#).
- ¹⁵ Gibbons S, Lyytikäinen T, Overman H G and Sanchis-Guarner R (2019). New road infrastructure: The effects on firms. *Journal of Urban Economics*, Volume 110, March 2019, Pages 35-50. <https://doi.org/10.1016/j.jue.2019.01.002>
- ¹⁶ Centre for Cities (2021). [Measuring Up: Comparing public transport in the UK and Europe’s biggest cities](#). 2021
- ¹⁷ Graham D J (2007) Agglomeration, Productivity and Transport Investment. *Journal of Transport Economics and Policy*, Vol. 41, No. 3, pp. 317-343. <https://www.jstor.org/stable/20054024>
- ¹⁸ Chatman D and Nolan R (2014) Transit Service, Physical Agglomeration and Productivity in US Metropolitan Areas. *Urban Studies*. Vol 51, No. 5, pp. 917–937. <https://doi.org/10.1177/0042098013494426>
- ¹⁹ Knowles R and Binder A (2017) [MediaCityUK at Salford Quays: A sustainable, transit oriented development](#). Manchester Geographies essay published by the Manchester Geographical Society.
- ²⁰ Blagden J and Tanner W (2021) [Network effects. Why levelling up demands a new approach to connectivity](#).
- ²¹ Forth T (2019) [Birmingham is a small city](#). Web article, Tom Forth website, 14/01/19.
- ²² Hammett J (2021) [A Light Rail Strategy for the UK. A Look Inside](#). Presentation by UK Tram at the UK Light Rail Summit, Edinburgh, 23/09/21.

²³ Forth T (2019) [Birmingham is a small city](#). Web article, Tom Forth website,14/01/19.

²⁴ Sloman L, Hopkinson L and Taylor I (2017) [The Impact of Road Projects in England.https://www.cpre.org.uk/wp-content/uploads/2019/11/TfQLZ-TheImpactOfRoadProjectsInEngland2017.pdf](https://www.cpre.org.uk/wp-content/uploads/2019/11/TfQLZ-TheImpactOfRoadProjectsInEngland2017.pdf) report for CPRE, March 2017.

²⁵ What Works Centre for Local Economic Growth (2015) [Evidence Review 7: Transport](#). July 2015.