



Campaign to Protect
Rural England
Standing up for your countryside

The end of the road? Challenging the road-building consensus

Learning from previous road schemes for a better future





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It would not have been possible to make this assessment of the impact of roads projects without the Post Opening Project Evaluation (POPE) evaluation process that was put in place by the Highways Agency 20 years ago. Although our assessment of the evidence has drawn some markedly different conclusions from those reached in the POPE meta-analyses, we acknowledge the value and importance of the POPE process itself. We also acknowledge and are grateful for the willingness of Highways England to assist with this research, by supplying data and information from their archives.

We also thank Tony Forward for access to his archive of planning documents.

Foreword

CPRE Chief Executive Shaun Spiers sets the new roads analysis in context and calls for a radical reset of transport policy.



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...we need a major overhaul of national roads policy. Predict and provide – building more roads to meet demand, in turn generating demand – will fail

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In 2006, Professor Phil Goodwin, in his seminal article “Induced traffic again. And again. And again”, pointed out that for 80 years, empirical studies and official reports had agreed on the rather inconvenient truth that more road capacity leads to more traffic. The article was prompted by CPRE’s landmark report, *Beyond Transport Infrastructure*, which had concluded that new roads fill up quickly. It showed that you cannot build your way out of congestion.

But this is not what a driver fuming in a traffic jam wants to hear (I speak personally). In 2014, the Government junked the evidence and announced the biggest road-building programme since the 1970s. Saloon bar policy-making won the day. The commitment is popular with MPs of all main parties, given that many of their constituents are suffering from congested roads. But will it work?

To answer this question, CPRE commissioned an even more comprehensive independent study of the impact of new roads on traffic, the landscape and, this time, also economic growth.

Unsurprisingly, evidence from the 13 cases analysed in detail for traffic impact concluded that road schemes generate more traffic. On average, traffic grew 47% more than background levels, with one scheme more than doubling traffic within 20 years. None of the four schemes assessed in the longer-term showed the promised reduction in congestion; all put pressure on adjoining roads.

As for economic impact, of 25 road schemes justified on the basis that they would benefit the local economy, only five had any direct evidence of economic effects at all. Even then there was no evidence the road was responsible for them, or hadn’t simply moved economic activity from elsewhere. And as regards the longed-for congestion relief, median journey times hardly changed, with savings of 90 seconds during peak periods.

And that was only on the bit of road directly related to the scheme – it didn’t look at the actual journeys people were taking.

What was sacrificed for these marginal gains? Sixty-nine out of 86 road schemes examined had an adverse impact on the landscape – not just obliterating views, but destroying ancient woodland and mature hedgerows. More than half damaged an area with national or local landscape designations for landscape, biodiversity or heritage.

Overall, this powerful study demonstrates that we need a major overhaul of national roads policy. Predict and provide – building more roads to meet demand, in turn generating demand – will fail. We need truly sustainable transport policies, founded on the principles of smarter travel: reducing the need to travel; increasing travel choices; and maximising efficiency through new technology.

We are calling on government to make road-building the last resort. Directing house building to suitable brownfield sites would reduce the need to travel, providing at least a million new homes close to jobs and services; reopening closed rail lines and stations would encourage a shift from road to rail; and investing in public transport and safer cycling routes would reduce car journeys.

In a small, crowded, affluent country like ours, we cannot possibly build our way to free-flowing roads. We need cleverer solutions – solutions that will improve people’s quality of life, benefit the economy and safeguard the countryside. I hope that government, both locally and nationally, will heed the evidence set out in this report and be brave enough to set a new direction of travel.

Shaun Spiers
Chief Executive, CPRE

Executive summary

Road-building is back on the agenda. CPRE set out to examine the assumptions that underpin it.

With the Government planning to embark on the biggest road-building programme in over a generation, the need for robust evidence-based decision-making is stronger than ever. More than a decade ago, CPRE published evidence that challenged the misguided belief that expanding the road network can reduce congestion without ravaging the landscape and wider environment in the process.¹

In order to investigate the credibility of the claims being made for the new roads programme, CPRE commissioned consultants at Transport for Quality of Life (TfQL), to produce an independent report.² Reviewing over 80 official evaluations of road schemes, as well as carrying out four detailed case studies of older road schemes, this research examined if road-building:

- delivered the congestion relief promised
- damaged the landscape as much as feared
- boosted local economies as hoped

With a much larger body of evidence now available, we have been able to publish an even more authoritative rebuttal of official claims³ over the benefit of building roads. The new TfQL research shows that road schemes:

- induce traffic, that is, generate more traffic – often far above background trends over the longer term
- lead to permanent and significant environmental and landscape damage
- show little evidence of economic benefit to local economies

The results are particularly damning in terms of economic impacts, for which there was insufficient evidence available to come to conclusions in 2006. Despite a thorough investigation of wider economic data, such as job creation and registration of new businesses, few or no economic benefits from building roads (depending on the scheme in question) were found by the new research.

The findings of this research suggest we need major changes across transport policy and beyond, in particular to:

- the model of using road-building to drive economic development
- how we assess road schemes versus other transport options
- how we judge road schemes that have been built and seek to learn from them

If we are to learn from the past, increasing road capacity needs to become the option of last resort rather than the default, as is currently the case. Otherwise we face a dead-end of increasing congestion, needless environmental damage and sprawling development that is as bad for productivity as it is for quality of life. Restructuring our transport system through applying an enlightened 'smarter travel' hierarchy and adopting more efficient patterns of development are urgently needed, if we are to break out of this vicious cycle.

The Impact of Road Projects in England by TfQL can be downloaded from CPRE's website: www.cpre.org.uk. This summary highlights the key findings and puts them in context.



Introduction

We've seen mounting evidence that road-building generates traffic. Yet new roads are still expected to improve productivity.

As highlighted in the foreword, Professor Phil Goodwin's 2006 article, *'Induced traffic again. And again. And again'*,⁴ documented the evidence, which first emerged in 1925 in relation to the Great West Road in west London; then again in a series of ten empirical studies and official reports between 1937 and 2006, each of which demonstrated that more road capacity leads to more traffic. As he put it:

'For 80 years, every eight years on average, there has been the same experience, the same conclusions – even, for goodness sake, more or less the same figures. The evidence has been consistent, recurrent, unchallenged by serious countervailing evidence but repeatedly forgotten.'

In 2006, CPRE and the Countryside Agency commissioned consultants to investigate the impact of road-building schemes, *Beyond Transport Infrastructure*. It assessed evidence drawn from 10 of the first Post-Opening Project Evaluations (POPEs) published by the Highways Agency (now Highways England) and three in-depth case studies. It found that traffic growth on these new roads was higher than forecast, sometimes dramatically so, and all three case studies showed evidence of significant harm to the landscape.

But despite the large and consistent body of evidence, successive governments, and the bodies that advise them, have repeatedly found it convenient to forget or deny that new roads generate more traffic independently of changes arising from growth in population or the economy.

In 2014 the £15 billion 'Road Investment Strategy' (RIS), trailed as the biggest roads programme since the 1970s, was announced. It stated that there was 'strong evidence that transport investment, including in roads, can improve productivity and GDP'. The former Chancellor George Osborne claimed this significant investment was key to 'unlocking jobs for the future and local growth'. Other factors were not forgotten, indeed, the RIS committed to ensuring 'the need to improve...environmental impact remains at the forefront of decision-making'.

Most of the construction element of the RIS – 1,300 extra miles of road lanes in an already heavily urbanised and densely populated country – is proposed to start at the end of 2019. In view of the direct loss of countryside caused by previous road programmes, and their wider impacts on patterns of development, there has never been a more important time to test the evidence behind the road-building programme.

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Professor Phil Goodwin

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M65 warehouses under construction on former Green Belt land



Ribbon development along the A120

What the research involved

CPRE asked the researchers to compare the initial intentions of road schemes with the subsequent evaluations, and examine some more closely.

Evidence of the effects of road-building was examined primarily in relation to three main areas. We specifically asked if road-building:

- delivered the congestion relief promised,
- damaged the landscape as much as feared, and
- boosted local economies as hoped.

We also wanted to investigate some of the additional impacts of building roads, including the impact on road safety and journey time reliability, as well wider environmental impacts – including on air quality, biodiversity, carbon emissions and heritage. Land use changes, in particular the types of development that followed road schemes, were also assessed.

Method

A large body of evidence, reputedly the largest in Europe, is now available about the impact of road schemes in England. The research was able to draw on more than 80 post-opening project evaluations (POPEs) of road schemes, many of which were carried out five years after the road scheme opening, as well as two overall reviews that sought to evaluate all their

findings together. The most recent overall review, or meta-analysis, was published in 2016 (see box below).

Four case studies were examined in detail. Two were chosen because they were featured in the 2006 report commissioned by CPRE, thereby enabling impacts up to 20 years after opening the new roads to be assessed, such as long-term changes to land use. The other two chosen were about ten years old, filling the gap in the evidence between the long-term case studies and the POPEs carried out after one and five years. Researchers visited the roads and interviewed local people.

To supplement this, a range of additional data was examined in relation to traffic flows and local economies. Wider traffic data was critical for two reasons. First, the main criticism of the previous research is that it failed to assess the degree to which traffic had simply, in effect, moved from other roads, rather than being additional traffic generated by the provision of new road capacity. By checking traffic figures across screenlines (lines drawn on maps to enable assessment of traffic changes) and on comparable roads across a region, the

new research has been able to be far more robust in its findings.

Second, despite general predictions of ever increasing traffic flows, traffic levels stabilised in England between 2003 and 2013. Since then they have remained stable in urban areas, although there has been an increase in rural areas. This has meant that many road schemes evaluated relied on traffic forecasts that turned out to be woefully inaccurate. The additional data enabled a much more accurate assessment to be carried out.

Regarding economic impacts, a ‘counterfactual’ approach was needed. Put simply, an investigation to attempt to understand what would have happened to local economies if a road had not been built. Economic data on changes to jobs and VAT registered businesses in areas affected by road schemes in the case studies were compared to comparator areas where there was no such change to the road network. This is a particularly challenging area of transport evaluation, which the research was able to shed new light on.

How are road schemes currently appraised and evaluated?

The Department for Transport publishes web-based Transport Appraisal Guidance (WebTAG), which sets out how transport schemes should be appraised in terms of their impacts for a range of issues such as traffic flows; safety; economic impact; and environmental impact. This information is published in a business case.

Highways England publishes a **POPE (Post-Opening Project Evaluation)** for every major scheme – road projects costing over £10m – comparing the actual impacts one and five years after opening against forecasts in their business cases.

Every two years, evidence from all the available POPEs is aggregated to produce an overall review, known as a meta-analysis. This meta-analysis is used as the basis for determining overall impacts of road schemes. The 2015 meta-analysis is the most recent and was published in January 2016.

POPEs are not all conducted to the same level of detail or quality, meaning that complete data is not available for all schemes on all issues over a complete timeframe. Indeed, in 89% of POPEs, less than half the required information was available. This has obvious impacts upon the robustness of their findings and indeed that of the meta-analysis.



All major road schemes are evaluated

Impact on traffic

All but one road scheme studied induced traffic, reinforcing findings from generations of roads research.

The 2015 overall analysis of road schemes published by Highways England concluded that there was little evidence of ‘induced traffic’ (additional traffic generated by the road scheme itself). To assess traffic impacts, in addition to the four in-depth case studies, the new research examined nine randomly selected POPEs, including:

- at least one scheme from each English region
- a range of scheme types (including bypasses, widening, and upgrades to motorway standards, but not junction schemes)
- a range of completion dates

The most common justification for road-building was that more road capacity would reduce congestion. The new research shows the opposite to be the case, with evidence from the nine POPEs and four case studies clearly showing that these road-building schemes created *more* traffic, independently of changes arising from growth in population or the economy. In other words, they induced traffic.

So, of the schemes studied:

- All road schemes, bar one, saw traffic growing significantly faster than background trends for other regional roads. This suggests that the new schemes were inducing traffic. In the remaining scheme, the traffic growth was the same as the background trend.
- The longer these roads schemes have been in place, the more traffic they have attracted. Schemes completed 8-20 years ago showed a 47% increase in traffic compared with a 7% increase of those completed 3-7 years ago.

As Table 1 sets out, there are some striking examples of induced traffic in more long standing schemes. The M65 Blackburn Southern Bypass saw more than a doubling of traffic over 20 years, with a 109% increase. Figure 1 illustrates these increases.

Furthermore, every case study road scheme resulted in traffic pressure on adjoining roads:

- **A120 dual carriageway Stansted to Braintree:** there is now pressure to make the A120 east of Braintree a dual carriageway, following traffic growth on the dual carriageway west of Braintree.

- **A46 Newark to Lincoln:** junctions to either side of the scheme are now above capacity; there are plans for a southern bypass that will link to the A46 dual carriageway.

- **A34 Newbury Bypass:** the local council is seeking to enlarge junctions and sections of the old road bypassed by the A34, because development has renewed traffic pressure in place of promised traffic ‘relief’.

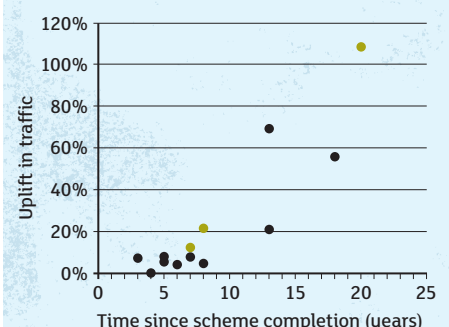
- **M65 Blackburn Southern Bypass:** there is pressure to widen the M65 and extend it eastwards because junctions and links are congested at peak times, largely due to car-dependent development alongside the existing motorway scheme.

If these schemes were built to reduce congestion, this approach backfired. The road schemes studied did not solve to the problems that they were supposed to but ratcheted up traffic levels year on year in a self-perpetuating cycle, by unlocking car-dependent development. Not only did this mean that the new roads filled up quickly, the bypassed roads did too in many instances. Worse still, traffic increased on roads feeding into the new roads, creating new pinch-points in the medium-term.

Table 1: Generated traffic across road schemes studied

Road scheme	Number of years since scheme completion	Year of ‘post-scheme’ data	Uplift in traffic ⁵ (%)
A1 Bramham – Wetherby	3	2010	7
M1 J25-28 Widening	4	2011	0.1
A500 Basford, Hough & Shavington Bypass	5	2008	8
A5 Weeford – Fazeley	5	2010	6
A10 Wadesmill – Colliers End Bypass	6	2009	4
A66 Stainburn and Gt Clifton Bypass	7	2009	8
M25 J12-15	7	2010	13
A1 Willowburn – Denwick	8	2008	22
A30 Bodmin – Indian Queens	8	2012	5
A46 Newark – Lincoln	13	2015	21
A120 Stansted – Braintree	13	2015	70
A34 Newbury Bypass	18	2015	56
M65 Blackburn Southern Bypass	20	2015	109
Short run average (3-7 years)			+7% (Average of 7 schemes)
Long run average (8-20 years)			+47% (Average of 6 schemes)

Figure 1: Uplift in traffic in excess of background traffic growth, by elapsed time since baseline year (green shows roads without full screenline data)



Impact on landscape

Official evaluations underplayed the landscape damage done by a clear majority of road schemes.

To assess landscape impacts, 86 schemes were examined for which landscape impacts had been evaluated. While the RIS stated the Government is 'striving to improve the impact on the landscape' in future, the POPEs for these schemes showed that:

- 80% had an adverse impact on the landscape, whether at one or five years after completion.
- 57% affected an area that had a national or local designation for landscape, biodiversity or heritage. A number of schemes had multiple impacts.
- Less than 5% improved the landscape,⁶ and in all instances this was only 'slightly'.

Landscape impact underplayed

These findings give a different impression to those of the Highways England 2015 overall analysis. Its headline finding that '80% of the schemes assessed show that the overall landscape objectives are set to be achieved'⁷ underplays the impact road schemes have on the landscape – indeed, almost suggests the opposite to what our research found. That is because the 2015 analysis focuses on whether schemes delivered their landscape objectives, rather than whether they actually harmed the landscape. Before construction, it was predicted that 76% of schemes would have an adverse effect on the landscape, so achieving landscape objectives simply meant causing the damage expected.

This is, of course, not a good outcome but is not easy to interpret at face value.⁸

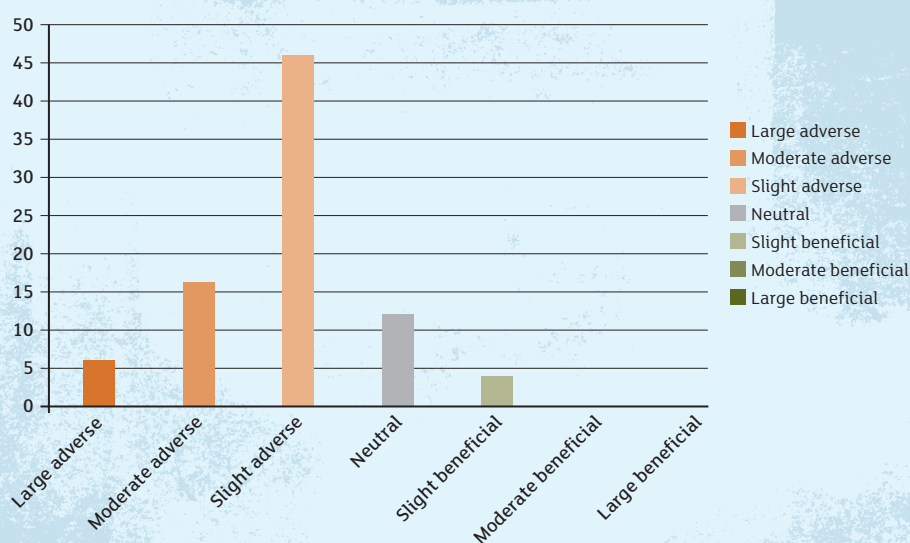
Furthermore, there are a number of factors to suggest that even these official findings are unjustifiably positive. Landscape evaluation of roads involves a mechanistic box-ticking approach, focused on issues such as whether planting schemes are 'neat and tidy', or whether tree guards need to be adjusted. This rigid assessment involves no professional input, such as consideration of how well the design fitted a road into the character of the landscapes through which it passes. Incredibly, in three-quarters of schemes there was no landscape monitoring information recorded that could then be evaluated. This does not give great confidence about the success of mitigation schemes.

The impacts of road schemes on tranquillity and light pollution were rarely touched on: the 2015 overview does not mention tranquillity at all. The landscape impact of schemes defined as having a 'slightly adverse' or 'neutral' effect may therefore be more serious than the language suggests. Indeed, such schemes frequently affected areas that were designated locally or nationally for their landscape value, but limitations in what POPEs measure and evaluate mean this was not consistently accounted for and therefore potentially underestimated.

Many of the 86 schemes that were studied affected areas that had protective designations for landscape, heritage or biodiversity:⁹

- 33 schemes affected an area that had either a national or local **landscape** designation. Of these, three schemes affected National Parks and ten Areas of Outstanding Natural Beauty.¹⁰ Twenty-five affected areas¹¹ locally designated for their landscape.¹²
- 11 schemes affected places with **heritage** designations, including Grade I, II(*) and II listed buildings and at least two Registered Parks and Gardens designed by Capability Brown.
- 20 schemes damaged areas that were nationally or locally designated for their importance to **biodiversity**,¹³ while 14 damaged ancient woodlands.

Figure 2: Landscape impact of road schemes



M65 damage to Stanworth Valley

Impact on economy

Evidence of the economic impact of road-building was weak, absent, or even negative. This suggests that driving economic development by building roads is not credible.

There is a strong belief amongst politicians and the business community, at both national and local level, that road-building is an obvious route to economic development. For example, in 2016 the Chancellor of the Exchequer (and former Secretary of State for Transport) Philip Hammond stated that ‘often it is modest, rapidly deliverable investments that can have the most immediate impact, particularly on the road network’.¹⁴ The 2015 overview from Highways England claimed that schemes had assisted ‘economic development [and] improved access to potential employment centres’, with all but one scheme that had an objective of ‘stimulating the economy’ having achieved this aim. Our new research gives a very different impression.

To assess economic impacts, the researchers reviewed the 25 schemes that were justified on the basis that they would benefit the local economy. In 76% of these schemes, the evidence ranged from thin and circumstantial to non-existent. Schemes were described as having been ‘successful’ and ‘extremely positive’ in their effects on the economy, but this was not justified by the evidence (see Figure 3).

- 32% had no evidence to enable a judgement to be made about the economic impact of the scheme.
- 44% had weak evidence of economic impact (either positive or negative):

- Three schemes had weak negative evidence (in other words, it suggested that these schemes had actually harmed the local economy).
- Three schemes relied on weak indirect evidence of a decrease in journey times to argue that an economic benefit could be inferred.
- Five schemes had weak evidence that the scheme might have benefited the local economy, typically anecdotal.
- Only 24% had evidence of economic uplift, but this was mixed.¹⁵ In most cases this statement needs to be qualified, because any economic improvement was probably the result of changes incidental to the road scheme. There is also no evidence on whether new economic activity associated with these road schemes was genuinely additional, or simply a displacement of economic activity from elsewhere.

Unfounded justifications

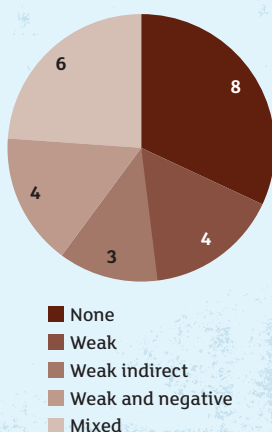
Although the distinction was not always clear-cut, the schemes assessed fell into three broad types of area and the justifications turned on these. The research found that the reality after opening did not live up to earlier promises made for the road schemes:

- In areas with a struggling economy, schemes were justified on the basis they would open up land for commercial

development, make existing sites more attractive or open up peripheral areas. Regeneration following completion of the scheme was generally slower than expected, or had not started, and this was not confined to schemes opening at the time of the economic downturn. Where development did occur it was not of the type the economy needed, such as providing reasonably paid, secure jobs for local people.

- In ‘pressure cooker’ areas, additional road capacity was justified to cater for development that would put additional pressure on congested roads. The development that then occurred was highly car-dependent, potentially undermining development in more sustainable locations such as town centres, and leading to greater congestion across a wider area. Such impacts are not considered in POPEs.
- In ‘neutral’ areas, schemes were justified for their reduction in journey times, supposedly enabling employers to draw from a wider pool of employees to boost the economy over a wider area (this justification was common across the board). It was claimed that reducing journey times by as little as a minute would make tens of thousands of new jobs accessible. However, no credible empirical evidence was presented of actual changes in employment rates.

Figure 3: Evidence of economic development in road schemes studied



Other impacts

The research found that official assessments of road schemes underestimated many of their other detrimental impacts.

Congestion and journey times

Older POPEs relied on a relatively simple 'Route Stress' approach to assess the reliability of journey times, the limitations of which have now been acknowledged. The research therefore scrutinised a random sample of more recent POPEs and found that reliability effects are mixed. All the schemes that were found to have robust analysis were opened at a time when background traffic levels were stable or falling. While many schemes appeared to show improvements one year after opening, only one showed positive evidence of improved reliability in journey times five years after opening, when reliability improvements can be rapidly eroded by induced traffic.

Journey time savings

Journey time savings for drivers appear to be considered the greatest single financial benefit of road schemes in the cost-benefit analysis. However, the research suggests that median journey time savings probably have little if any effect for each driver in practice, with only 1.5 minutes saved during peak periods¹⁶ and 1 minute during the inter-peak/off-peak.¹⁷ There is extensive literature critiquing how these small changes, which in practice have little, if any, effect for individuals, shape official cost-benefit analysis. In any event, these are just the savings travelling along a particular road scheme, rather than for door-to-door journeys. Where road schemes generate traffic these savings will be cancelled out, or even negated, if they lead to greater congestion on the surrounding road network.

Road safety

While the vast majority of schemes met their road safety criteria after opening,¹⁸ as the 2015 overview notes, it is difficult to draw clear conclusions. Most schemes assumed that if they had not been built, the number of personal injury collisions would remain the same. In fact, there was a significant decrease nationally in these types of collisions of 40% between 2000 and 2015.¹⁹ Taking this into account, the Highways England 2015 overview found that about half of schemes reduced the number of collisions, while the other half increased them, a rather mixed result.

In light of other findings about very substantial long-term increases in traffic, data would need to be assessed for 10-15 years after opening to enable more robust conclusions to be made. The new research includes such an assessment for the Newbury Bypass and found a sudden increase in collisions after opening, followed by a decrease, followed by another increase. This was significantly worse than the national trend. With road fatalities increasing nationally in each of the past three years, it is vital that longer-term safety impacts of road schemes are investigated further.

Car-dependent development

The case studies also demonstrate that road-building is closely associated with a pattern of land development that relies on people using cars. The increased capacity created by a widened or new road often leads to housing developments being built that have few or no facilities. These become dormitory commuter villages, with the vast majority of residents having no option but to commute and shop by car. Road schemes are also associated with development of car-dependent business parks and retail parks.

Biodiversity

The 2015 Highways England overview notes a large number of examples of road schemes damaging biodiversity. Sometimes this was an inevitable consequence of the scheme; sometimes it was because measures to offset the damage caused by the road had not been identified; sometimes because these measures had been identified but not implemented, or had been implemented poorly; and sometimes because necessary ongoing maintenance had not taken place, or new structures had been vandalised. In other cases, there was no information about whether the mitigation measures had been effective, because no ongoing monitoring was undertaken. Highways England has committed that its road network should secure a 'net gain for nature', in line with wider government policy: the findings here suggest that without major changes, this may be a bigger challenge than previously thought.

Greenhouse gas emissions

The new research found that POPE studies have been underestimating the impact of road-building on greenhouse gas emissions because they failed to take account of lower than expected growth in background traffic levels and traffic generated by roads after their opening year. Adopting a conservative approach, the research found cumulative emissions from 54 road schemes opened between 2002 and 2010 were of the order of 8 Mt CO₂ over the period 2002 to 2015, equivalent to an increase of 3% annual emissions from traffic – or putting an extra 590,000 cars onto the road.²⁰ Emissions from these schemes are likely to increase further over time as they continue to generate more traffic. The commitment in the Road Investment Strategy to 'major reductions in carbon emissions across the [road] network' appears difficult to reconcile with its ambitions for major road-building.

Health impacts

Air pollution and physically inactive lifestyles are major causes of deaths. While some road schemes (such as bypasses) may result in short-term improvements in air quality in bypassed areas, evidence in the case studies shows these benefits were quickly eroded. The long-term effect is to increase overall levels of traffic, leading to increased emissions of nitrogen oxides and particulates that are damaging to human health. Effects on physical fitness are supposedly evaluated in POPEs, but the treatment is perfunctory, largely focusing on whether changes to the public rights of way network required for the scheme have actually been implemented. The more important question of the effect of road schemes on overall levels of physical activity, such as through additional travel by car, replacing walking (including to public transport) and cycling trips, is not addressed.

Case study findings

In order to gain a more detailed understanding of the effects of road schemes beyond the short and medium term, four in-depth case studies were carried out.

Two of the case studies were road schemes that had been examined in detail in the study for the 2006 CPRE research: the A34 Newbury Bypass (South East) and the M65 Blackburn Southern Bypass (North West). These were chosen because they could provide a longer term view of what happens when new roads are built. The other two case studies were more recent schemes, to provide insights on whether the design of roads schemes or their impacts have changed. These were the A46 Newark to Lincoln (East Midlands) and A120 Stansted to Braintree (East Anglia).

Traffic

All the schemes showed very significant rises in traffic levels in the long-term, far greater than the trend in the surrounding regions; the minimum was a 71% rise on the A46 Newark to Lincoln, while it more than doubled on the M65 Blackburn Southern Bypass.

In all four case studies, key opportunities to reduce traffic through rail improvements were missed. The other side of the coin is that all four road schemes have created new pinch-points for the traffic, leading to pressure for further road-building to tackle congestion.

Environmental and landscape impact

All the case studies showed significant damage to the environment. The A46 Newark to Lincoln involved the loss of 10km of hedgerows in an Area of Great Landscape Value, affected four Sites of Nature Conservation Importance and partly destroyed three ancient woodlands. The A120 Stansted to Braintree severely degraded the crossing of the River Chelmer and intruded on the Special Landscape Areas of the Chelmer and Stebbing Brook. It also destroyed 1,300m²

of High Wood Site of Special Scientific Interest (SSSI) and ancient woodland.

The A34 Newbury bypass severed three SSSIs and built over half of Rack Marsh Nature Reserve, while traffic noise eroded tranquillity at Donnington Castle. The M65 Blackburn Southern Bypass severely damaged the ancient woodland of the Cuerdon Valley Park and Stanworth Valley.



Derelict listed gatehouse to the High Wood SSSI damaged by the A120

Attempts to mitigate environmental impacts did not live up to expectations in all four schemes. Compensation planting for the A120 Stansted to Braintree failed because of lack of protection from deer and an inability to find a location to replant precious turfs containing bee orchids. The relocation of the nationally significant Desmoulin's whorl snail at Newbury, a totem of road protesters, failed because contractors forgot to unblock pipes at its replacement site.



A car-dependent settlement just off the A46

Economic impact

All four case study schemes showed how road-building is closely associated with a pattern of development that is highly car-dependent. For example, in Lincolnshire, making the A46 a dual carriageway facilitated development of more than 1,200 homes on a disused RAF airfield in the middle of the countryside away from existing infrastructure, with a further 1,250 homes recently given planning permission. In Essex, over

13,000 new dwellings are anticipated at various rural locations along the 'old' A120. The housing that has already been built on sites adjacent to the 'old' A120 also relies on people using their cars, and census data shows that its residents overwhelmingly drive to work.

Road schemes are also associated with development of business parks and retail parks that also rely on people driving there. In Newbury, the multiple business parks and retail parks that have been developed or expanded since construction of the bypass generate large numbers of vehicle movements, causing serious congestion on the 'old' road (now the A339). These sites include many businesses and retailers that could otherwise be in the town centre. In Lincolnshire, the A46 dual carriageway has facilitated car-based leisure and commercial developments at either end of the scheme.



Development at M65 junctions has urbanised countryside

In Blackburn, the development of new sites around M65 junctions has created a semi-industrial, urban landscape of motorway services, light industrial areas, storage and distribution sites, car showrooms and business parks, where there was once open countryside. This pattern of development is a major cause of the high levels of traffic growth associated with road schemes in the long term.

Economic indicators for each of the case studies were compared with the five 'most similar' local authorities in England. There is little evidence of better economic performance either in terms of jobs or net numbers of businesses in the case study areas. It does not prove there was no effect but does show that if there was one, it must have been small.



The A46 dominates the flat and tranquil Lincolnshire landscape

Conclusions and recommendations

TfQL's new research, commissioned by CPRE, set out to test whether road-building:

- delivers the congestion relief promised
- damages the landscape as much as feared
- boosts local economies as hoped

From examining road-building over the past 20 years, the researchers found clear evidence that road schemes:

- induce traffic, often far above background trends over the longer term
- lead to permanent and significant environmental and landscape damage
- show little evidence of economic benefit to local economies

There were also other damning conclusions, including widespread damage to biodiversity and worse than expected increases in greenhouse gas emissions, as well as encouraging car-dependent housing and retail development. The official process for appraising road schemes before they are built – and evaluating them after they open – is also seriously flawed and in need of far-reaching reform.

Was road-building ever the solution? It does improve the 'driving experience' in the short run because the extra traffic takes time to appear, but, because of the effects on patterns of development, these effects are temporary. The environmental effects are, by contrast, permanent. The case studies provide sufficient detail to be able to show that roads studied in depth failed to provide 'the answer' to the problems that they were supposed to solve. The roads failed to create the sustainable employment and economic growth we need. Instead, they encourage a new kind of infill 'ribbon development' of homes and industry along transport corridors, killing investment and regeneration in local town centres, while damaging the countryside.

As for the main justification for this model, any respite from congestion provided by a new or widened road is temporary, before the doomed cycle starts again. The prevailing ideology is to continue ploughing funding into a disastrously unsuccessful policy of continually

'bypassing the bypass'. The present economic development model of *roads* → *car-based development* → *traffic growth* → *more roads* is unsustainable and ineffective. Above all, it damages the vitality of town centres and our precious countryside. Provision of more road capacity does not deliver a stable situation – the more capacity is increased, the more capacity increases are 'needed', leading to the cycle illustrated in Figure 4.

Researchers' recommendations

The report commissioned by CPRE makes a series of recommendations, split into national policy, appraisal of road schemes and evaluation of schemes after opening. They are detailed in the full report. The research from TfQL came to an overwhelming conclusion that road-building policy is based on repeated misreading of the evidence (CPRE suggests a way forward, overleaf).

In terms of national policy, it calls for:

- Adopting a model of economic development that stops wasting land and generating congestion by avoiding sprawl.
- A different approach to transport policy, shifting away from adding road capacity towards a restructuring of the transport system, by adopting a 'smarter travel' hierarchy (see Figure 5).
- Proper consideration of ambitious alternatives to road-building at an early stage.
- Putting road pricing back on the agenda if ambitions to cut congestion and carbon emissions are to be taken seriously.

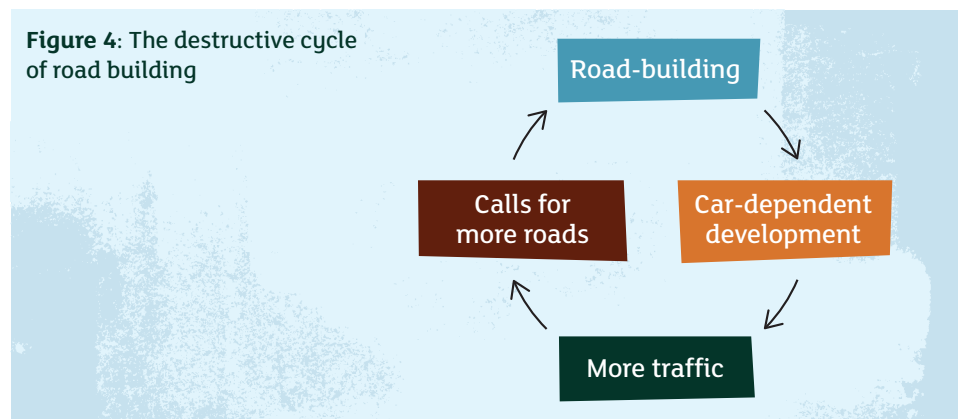
- Changing the role of Highways England so that it focuses on managing demand on its road network, while seeking to reduce environmental impacts so that roads fit better with the places they serve and pass through.

The skewed priorities in evaluating road schemes need to change, as should the frequently over-optimistic claims. Savings of seconds of drivers' time that are unlikely to be maintained across door-to-door journeys should not trump long-term impacts to our natural environment and vitality of our towns. Assessing these wider impacts to land use and quality is not always easy, but we should avoid simply focusing on those impacts that it is easiest to quantify.

The evaluation of road schemes after opening is important and necessary, but the way in which it is currently being undertaken does not provide a suitable basis for policy-making. Major changes are needed, including:

- Far better collection of pre-scheme and post-opening data, to enable checking against wider trends and appropriate comparator areas.
- Evaluation by environmental professionals rather than just box ticking by contractors.
- Longer-term evaluation of a selection of schemes 15 years after opening, including of wider land use changes.
- Independent peer review to improve the rigour and quality of the evaluation process.

Figure 4: The destructive cycle of road building



CPRE's view

CPRE agrees wholeheartedly with TfQL's recommendations. We believe that increasing road capacity must be the last resort: putting this into practice requires fundamental change to current priorities.

CPRE is calling on the Government to adopt an enlightened 'smarter travel' hierarchy* as the basis of its transport policy and investment decisions – and focus on a new mobility investment strategy that can realise the potential to widen travel choices. The current *Road Investment Strategy* should focus explicitly on keeping roads in good repair and reducing their environmental impacts, rather than increasing capacity.

This would make our transport system more sustainable and efficient by reducing reliance on cars, cutting carbon emissions and improving air quality.

Figure 5: The 'smarter travel' hierarchy

- **Minimise demand** by focusing development in towns, around new and existing rail stations, with density and urban form to reduce commuting distances and make walking, cycling and public transport the modes of choice.
- **Widen travel choices** by investing strategically in rail and light rail corridors, to unlock land for housing and employment, and in high quality walking and cycling routes.
- **Improve efficiency**, including through road pricing, with revenues raised invested in high frequency public transport on the same corridors to reduce car-dependency, and increasing occupancy, such as through car sharing and more efficient freight transport.
- **Increase capacity as a last resort.** Rather than roads being the first resort, they should be the last. New road capacity should only be considered if these options have been fully implemented, if environmental limits would not be exceeded, and if measures are put in place to lock in the benefits of the additional capacity.

Minimise demand



Widen travel choices



Improve efficiency



Increase capacity

*The hierarchy was introduced by the Sustainable Development Commission in its report, *Fairness in a Car Dependent Society* (2011). <http://www.sd-commission.org.uk/publications.php?id=1184>

Notes and references

- ¹ Lilli Matson, Ian Taylor, Lynn Sloman and John Elliott. *Beyond Transport Infrastructure*. CPRE and the Countryside Agency, 2006.
- ² Lynn Sloman, Lisa Hopkinson and Ian Taylor (2017) *The Impact of Road Projects in England* Report for CPRE (available from CPRE's website www.cpre.org.uk).
- ³ The Highways England 2015 meta-analysis of 65 road schemes Post-Opening Project Evaluations.
- ⁴ Phil Goodwin *Induced traffic again. And again. And again.* 2006.
- ⁵ Relative to comparator.
- ⁶ 4 out of 86 schemes.
- ⁷ Highways England as in 3 above.
- ⁸ It is worth highlighting that the official 80% figure is a reduction from previous reports: in 2013 84% of schemes met their landscape objectives, while in 2010 90% did. Given the problems with the data it is not possible to comment further but this clearly is worth further investigation.
- ⁹ While biodiversity and heritage designations are not synonymous with landscape quality/character, sites with these designations are likely to also have landscape value in certain instances.
- ¹⁰ Of these, seven cut through an AONB, and three were adjacent to an AONB such that they affected the view from it or caused light pollution within it.
- ¹¹ Five listed for their impact on nationally-designated areas, plus a further 20 schemes.
- ¹² For example as a Special Landscape Area, or Area of High Landscape Value. Different terms are used by different local authorities to designate areas that have a special landscape which, although not of national significance, is nevertheless important at the local level. Other terms used are Area of Great Landscape Value, Area of Best Landscape Value, Landscape Conservation Area and Area of Local Landscape Importance.
- ¹³ That is, affecting one or more of the following: Ramsar site; candidate Special Area of Conservation; Special Protection Area; National Nature Reserve; SSSI; Site of Importance for Nature Conservation; ancient woodland; or having local Biodiversity Action Plan status. In addition, one scheme was adjacent to a local wildlife trust reserve.
- ¹⁴ The Select Committee on Economic Affairs, Thursday 8 September 2016.
<http://data.parliament.uk/writtenevidence/committeeevidence.svc/evidencedocument/economic-affairs-committee/chancellor-of-the-exchequer/oral/37979.html>
- ¹⁵ Even for these, the economic improvement may have arisen from changes incidental to the road scheme, or it led to development in an inappropriate location, or was as likely to suck money out of the local area as to bring it in.
- ¹⁶ Based on 40 road schemes for which pre- and post-completion data are available.
- ¹⁷ Based on 30 schemes. Estimates, based on Figures 4-18 and 4-19 of 2015 meta-analysis. A previous meta-analysis in 2011 quotes 'average' journey time savings of 3 minutes in peak periods and 2.5 minutes in inter-peak periods, based on a smaller sample of schemes than in 2015. 'Average' (presumably mean) figures are misleading, because they are distorted by the small number of road schemes that show very large time savings.
- ¹⁸ 71 schemes studied had an objective to increase road safety, with 61 achieving this.
- ¹⁹ The trend is similar for all injury collisions and for collisions involving death or serious injury (Department for Transport road safety statistics RAS10013).
- ²⁰ Assuming average CO₂ emissions of 156.6g/km, and average annual car mileage of 7,900 miles (12,640 km).

CPRE fights for a better future for England's unique, essential and precious countryside.

From giving parish councils expert advice on planning issues to influencing national and European policies, we work to protect and enhance the countryside.

Our objectives

We campaign for a sustainable future for the English countryside, a vital but undervalued environmental, economic and social asset to the nation. We highlight threats and promote positive solutions. Our in-depth research supports active campaigning, and we seek to influence public opinion and decision-makers at every level.

Our values

- We believe that a beautiful, tranquil, diverse and productive countryside is fundamental to people's quality of life, wherever they live
- We believe the countryside should be valued for its own sake
- We believe the planning system should protect and enhance the countryside in the public interest



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