Additional empirical evidence on induced traffic for the consultation on the National Networks National Policy Statement

May 2023

Induced traffic is defined as '**the increment in new vehicle traffic that would not have occurred without the improvement of the network capacity'**[1].

There is a substantive body of evidence on the scale of induced traffic including the seminal 1994 SACTRA report which concluded that "*An average road improvement, for which traffic growth due to all other factors is forecast correctly, will see an additional [i.e. induced] 10% of base traffic in the short term and 20% in the long term*."[2] This was based on a synthesis of a number of different sources of evidence, including before-and-after traffic counts on improved roads and alternative routes they had been designed to relieve, evidence on values of time and demand elasticities with respect to prices and travel times, evidence on the amount of time spent travelling, and theoretical considerations from economics and behavioural studies.

The academic journal *Transportation* published a special issue on the theory, evidence and implications of that SACTRA report, including a paper by Goodwin (2006)[3] on the empirical evidence and its analysis. In a 2006 summary he commented "*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*"[4]. He cited a 2006 CPRE report which found that after the opening of 13 large road schemes traffic growth was significantly higher than growth on other nearby road corridors or national traffic growth[5]. A later 2017 report by Transport for Quality of Life for CPRE used (the then) Highways England's published reports on national road schemes to show that they also generated additional traffic over and above background traffic growth with average increases of 7% over the short term (3-7 years) and 47% over the long term (8-20 years)[6].

The draft NPS (para 3.3) appears to ignore the evidence on induced demand, stating "*Evidence that development on the network leads to induced demand is limited. A recent literature review suggested that the scale of any induced demand is likely to vary depending on circumstances"*[7]. These two sentences are given as the summary of one study only, a 2018 literature review commissioned and published by the DfT itself, which was designed to review the empirical evidence since SACTRA[8].

The first sentence is somewhat disingenuous. It is indeed strictly true that the evidence is 'limited', in the sense that it is not unlimited. But it is still substantial, since the 2018 review actually *supported* the

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[1] WSP and Rand Europe (2018) Latest Evidence on Induced Travel Demand: An Evidence Review. Report for DfT, May 2018

[2] The Standing Advisory Committee on Trunk Roads Assessment (1994) Trunk Roads and the Generation of Traffic. Report for DfT, Chairman Mr D A Wood, QC, December 1994.

[3] Goodwin, P (1996) Empirical evidence on induced traffic: a review and synthesis, *Transport Reviews* 23, pages 35–54 (1996). https://doi.org/10.1007/BF00166218.

[4] Goodwin P (2006) Induced traffic again. And again. And again. Article for Transport Extra, 24/08/06.

[5] Matson L, Taylor I, Sloman L and Elliot J (2006) Beyond Transport Infrastructure: Lessons for the future from recent road projects. Report for CPRE, July 2006.

[66] Sloman L, Hopkinson L and Taylor I (2017) The Impact of Road Projects in England. Report for CPRE, March 2017.

[7] DfT (2023) Draft National Policy Statement for National Networks. Consultation document, March 2023.

[8] WSP and Rand Europe (2018) Latest Evidence on Induced Travel Demand: An Evidence Review. Report for DfT, May

findings of the SACTRA report, and states, as SACTRA did, that induced traffic can be significant. It does indeed state that "*its size and significance is likely to vary in different circumstances*"[9] but this can hardly be interpreted as a criticism of the SACTRA conclusions, which made exactly the same point. While the review states that evidence on the *sources of induced traffic* are limited and that *case study* evidence is limited, one of the case studies it reviewed was the 2017 CPRE report. This in turn used National Highways own case study data from 80 or so national road schemes, and found, as quoted above, significant evidence that development on the network leads to induced demand. It was particularly evident that ex post traffic growth on roads where the capacity had been increased was greater than background traffic trends generally.

This submission provides further evidence of induced traffic on the network by reviewing the 40 or so POPE reports published since the 2017 report for CPRE. These are published on the DfT website[10] (up to March 2020) or on the National Highways website[11] (after March 2020). These reports are either One Year After (OYA) or Five Years After (FYA) following the opening of a road scheme. The FYA reports are more likely to give a better indication of the size and significance of induced traffic over the short term than OYA reports, which is consistent with the SACTRA findings that long run induced traffic after several years was on average, of the order of twice as great as the effect after a year. This is particularly relevant since the appraisals depend on estimated impacts over a long period, of up to 60 years, not the temporary relief that may be seen almost immediately.

We have randomly selected one scheme from each region with a FYA report and compared the change in traffic five years after the scheme opened with the change in traffic locally and regionally over the same period[12]. Note that we have used the change in traffic across a screenline to take account of any reassignment (e.g. from an old road to a new bypass). Many of the reports provide screenlines but in a couple of cases we had to create them from the traffic figures given in the report. We have also redone the analysis of background traffic given in the reports, to match the dates of the screenline analysis, for a better like-for-like comparison. Note that generally the POPE reports provide only 2 years of traffic data (before and five years after) for the screenlines compared to annual data for the background traffic.

The list of schemes and the results are shown in Table 1 and Figure 1. These opened between 2008 and 2012 and generally involve road widening (dualling of single carriageways or conversion of dual carriageways to motorways), dual carriageway bypasses and new or widened motorway junctions. Figure 1 shows the screenlines as red dashed or dotted lines.

This shows that out of 8 randomly selected major schemes, there is clear evidence of induced traffic for four schemes (A1 Dishforth to Leeming; A46 Newark to Widmerpool; M40 Junction 15; and A421 Bedford to M1 Junction 13), possible evidence for two schemes, and no evidence for two schemes. In some screenlines the increase in traffic was 10 percentage points higher than the local/regional growth. Generally, the possibility that the increase may be due to induced traffic is not explicitly acknowledged, though in the case of the M40 J15 (Longbridge Roundabout), the POPE FYA report

[9] WSP and Rand Europe (2018) Latest Evidence on Induced Travel Demand: An Evidence Review. Report for DfT, May

[10] https://www.gov.uk/government/collections/post-opening-project-evaluation-pope-of-major-schemes

[11] https://nationalhighways.co.uk/our-roads/post-opening-project-evaluation-pope-of-major-schemes/

[12] The POPE reports provide traffic figures in terms of traffic flow (Average Annual Weekday Traffic) while the local/regional traffic figures used were annual total vehicle km, which were both indexed to the same 'before scheme' year for comparison.

notes that observed flows north of J15 increased by 13%, and states "*Additional traffic flows along the A46 could be a result of induced traffic capitalising on the scheme benefits outlined at OYA*."

One of the conclusions of the 2018 DfT review was "***The evidence on the existence of induced demand means that it needs to be properly accounted for in appraisal of capacity improvements to the Strategic Road Network."*** We agree with this conclusion and consider that the NPS, as currently drafted, presents a limited and misleading summary of the evidence from national networks on induced traffic. The implications of a more balanced consideration of the evidence is that capacity improvements could lead to further congestion (as well as carbon, air quality and other impacts). This would seriously undermine the drivers of the need for development, including maintaining network performance and meeting customer needs; supporting economic growth and supporting the Government's environment and net zero priorities.

Conclusion

In summary, we have observed five main bodies of evidence: the 1994 SACTRA study, a study for CPRE in 2006, the 2017 Transport for Quality of Life analysis of Highways England's own empirical data on traffic flows one year and 5 years after road expansion published up to 2017; the 2018 review carried out for the DfT by WSP and Rand Europe; and new analysis, specifically for this submission, again from Highways England's own traffic counts, of a sample of their road schemes which were published after 2017. They all show that induced traffic was, and remains, a significant issue in the appraisal of road capacity increases. To say that this evidence is 'limited' does not do it justice.

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Table 1: List of major road schemes with FYA evaluations randomly selected in each region

Region	Scheme	Year of opening (a)	Evidence of induced traffic	Note
NE	A69 Haydon Bridge Bypass (1.5 mile bypass around village)	2009	No	Background traffic 2007-2014 changed by 2%, -1% and 0% in Northumberland, NE and England respectively. Traffic across one screenline (east to west old and new bypass) by 4% and reduced on a second wider corridor screenline by 7%
NW	M6 Carlisle to Guards Mill Extension (5.4 miles dual carriageway widened to motorway and local access road)	2008	Possibly	Background traffic 2006-2014 increased by 1% in Cumbria, NW and England. Traffic across one screenline (north and south, M6 and new local road) by 3% and no change on a second (east and west movements on A6071, A689 and A69)
YH	A1 Dishforth to Leeming (13 miles dual carriageway widened to motorway and local access roads and new junctions)	2012	Yes (b)	Background traffic 2008-2018 increased by 11%, 9%, 7% in North Yorks, Yorks & Humber and England respectively. No screenlines are given in the report so we created a northern and southern screenline. On the southern screenline traffic increased by 22% and on the northern screenline traffic increased by 49%
EM	A46 Newark to Widmerpool Improvement (17.5 miles of dual carriageway)	2012	Yes	Background traffic 2009-2017 increased by 13%, 11%, 8% in Nottinghamshire, East Midlands and England respectively Traffic across northern screenline increased by 25% and across southern screenline by 15%
WM	M40 J15 (Longbridge Roundabout) (1.8 mile dual carriageway bypass of A46 to circumvent M40 J15, and widening of roundabout at J15)	2010	Yes (c)	Background traffic 2005-2015 increased by 10%, 5% and 4% in Warwickshire, West Midlands and England respectively. No screenlines are given in the report so we used traffic flows (ADT) at A46 north of J15 (site 1) which increased by 11% and created a southern screenline, across which traffic flows increased by 21%.
EE	A421 Bedford to M1 J13 (new 8 mile dual two-lane A421 carriageway and detrunking of the former A421 route; improvements to M1 Jn 13; GSJ and removal of retail park roundabout)	2010	Yes	Background traffic 2009-2015 increased by 8%, 5% and 4% in Bedfordshire, East England and England respectively Traffic across screenline 1 (wider screenline south of Bedford) increased by 11% while across screenline 2 (north of Bedford) increased by 29%

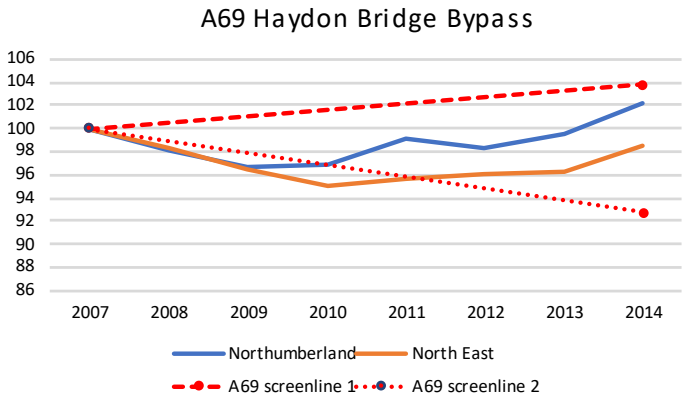
SE	A3 Hindhead Improvement (new 6.4km/4 mile dual carriageway bypass including 1.9km/1.2 mile tunnel)	2011	Possibly	Background traffic 2007-2016 increased by 2%, 5%, 1%, 4% and 4% in Surrey, Hampshire, West Sussex, South East and England respectively Traffic across strategic screenline (wide corridor including M3, A3 and several A roads) increased by 4% while across local screenlines (north and south of the A3 to assess ratrunning) increased by 18% and 27% respectively
SW	A419 Blunsdons Bypass (dual carriageway bypass)	2009	No	Background traffic 20016-2014 changed by -2%, 21% and -2% in Wiltshire, South West and England respectively Traffic on the eastern screenline reduced by 2%, traffic on the western screenline increased by 21% and traffic on the old/new screenline reduced by 2%

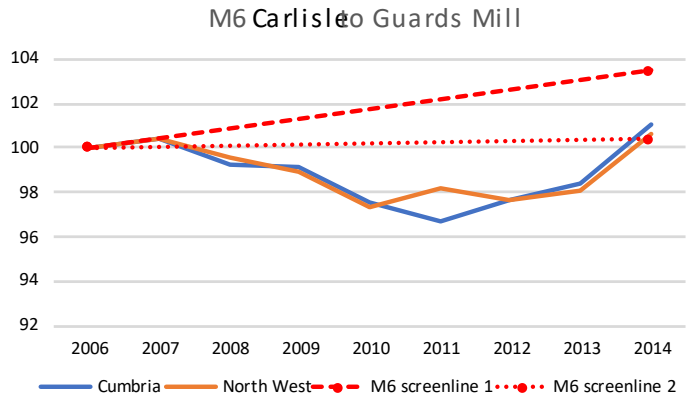
(a) Note that POPE FYA reports are often published on the DfT or National Highways website much later than five years after opening.

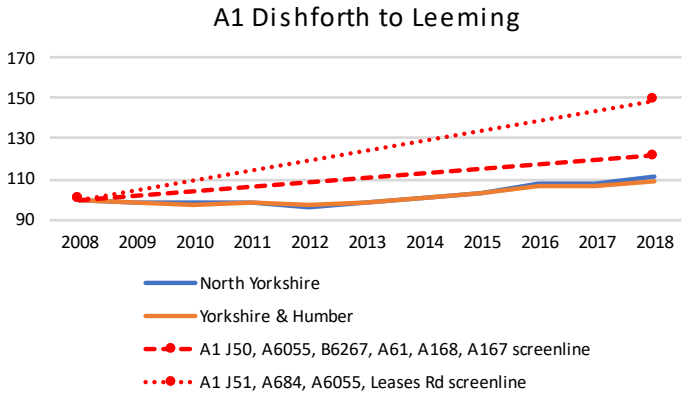
(b) No screenlines were given in the report but we created our own screenlines based on traffic counts given at various sites in the report. The Northern screenline comprises traffic flows on A1 Jn 51, A684, A6055 north of Green Gate and Leases Rd while the Southern screenline comprises traffic flows on A1 Jn 50, A6055 north of Holme Beck, B627, A61 south of Wilde Howe Lane, A168 north of Topcliffe Slip Rd and A167.

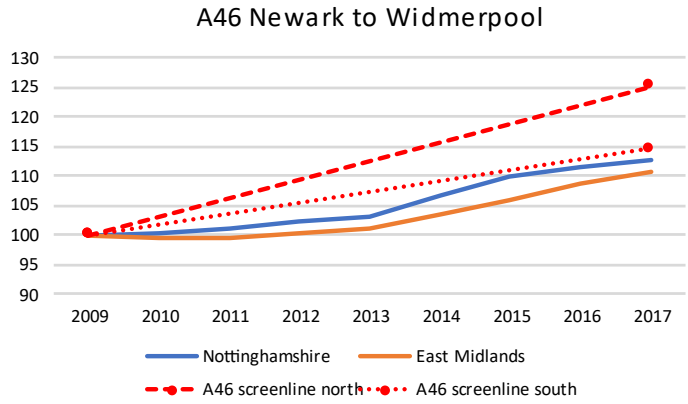
(c) The possibility of induced traffic is acknowledged in the POPE report. No screenlines are given in the report but we created our own screenline based on traffic counts given at various sites in the POPE report. The southern screenline comprises traffic flows on A46 new (site 2), A46 (old) between J15 & B4463 (site 4) and A429 south of J15 (site 7)

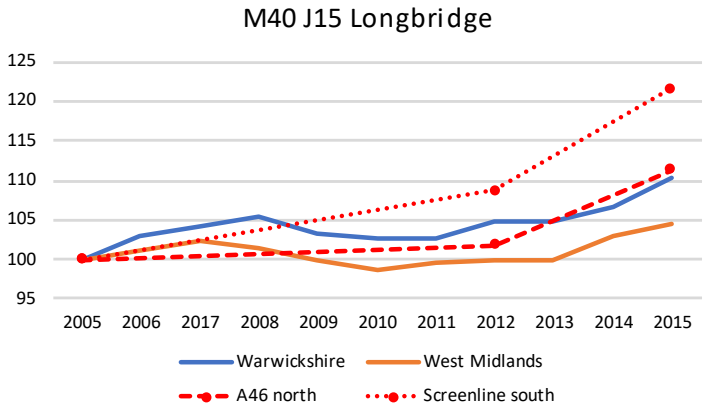
Figure 1: Charts showing change in traffic across screenlines before and five years after scheme opening and change in local and regional traffic over the same period

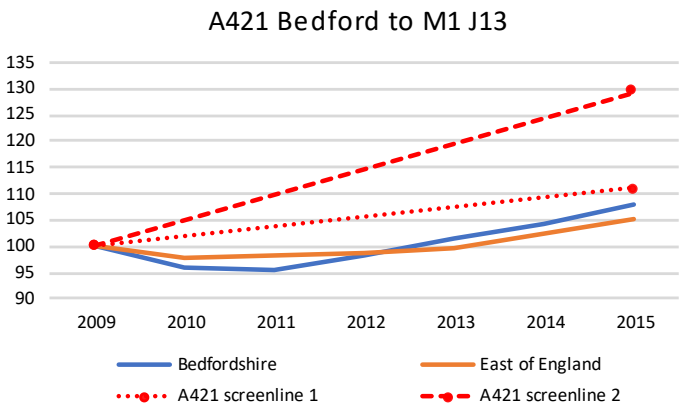


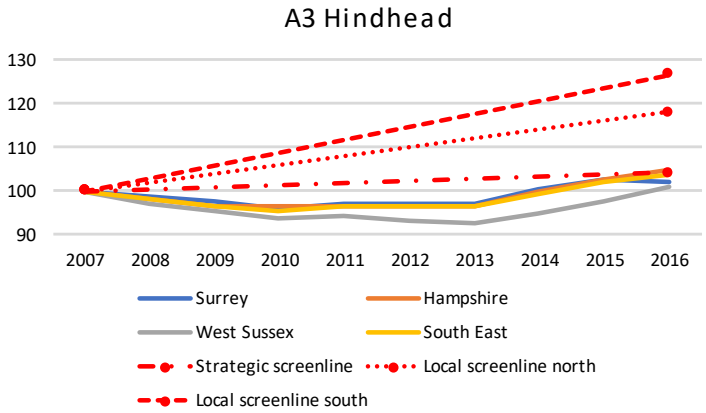


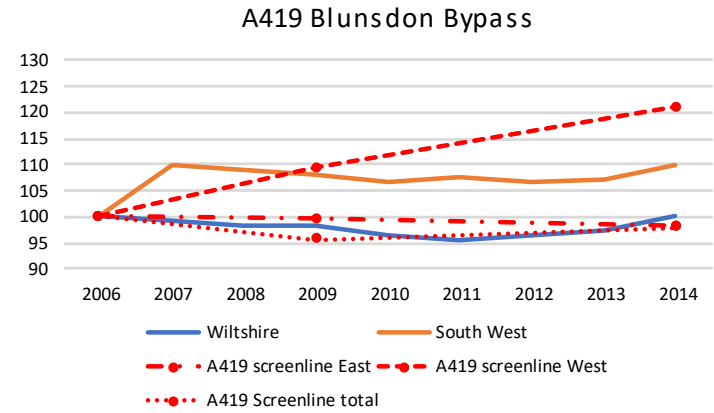





M40 J15 Longbridge
125
120
115
110
105
100
95
2005 2006 2017 2008 2009 2010 2011 2012 2013 2014 2015
Warwickshire
West Midlands
A46 north
Screenline south


A421 Bedford to M1 J13
135
130
125
120
115
110
105
100
95
90
2009 2010 2011 2012 2013 2014 2015
Bedfordshire
East of England
A421 screenline 1
A421 screenline 2


A3 Hindhead
130
120
110
100
90
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016
Surrey
Hampshire
West Sussex
South East
Strategic screenline
Local screenline north
Local screenline south


A419 Blunsdon Bypass
130
125
120
115
110
105
100
95
90
2006 2007 2008 2009 2010 2011 2012 2013 2014
Wiltshire
South West
A419 screenline East
A419 screenline West
A419 Screenline total