THE STRATEGIC ROAD NETWORK

NEEDS

STRATEGIC POLICY APPRAISAL

by

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Summary

The Government aims to improve travel conditions on the ‘strategic road network’, usually defined as the motorways and some trunk roads which provide for longer distance road travel. Discussions on the function of this network usually feature the economic importance of movements of freight to and from ports, and between the major cities of the UK.

But there is a fault-line in the assumptions and methods being used to test the effectiveness of different polices on road capacity and traffic management. In all forecasts and appraisals, all traffic which is using the ‘long-distance’ roads is included indiscriminately, even if it is just making short hops on the motorway as part of a mainly urban journey. Yet at the same time, all policies in the urban areas which have an effect on the volume of that traffic are ignored.

This makes for simpler and quicker studies, but results in a very unattractive underlying prospect, which is rarely made explicit, but underpins the current generation of studies. Essentially this arises because policies described as ‘improvements’ are not improvements at all, but at best a slowing down of the pace of deterioration embedded in the forecasts. An over-optimistic discussion is then attached to an over-pessimistic forecast. True consensus is impossible because two incompatible approaches are being pursued at the same time; more traffic is expected to pour off the motorways onto local roads which cannot cope with it (but is ignored), and more traffic is expected to come from the cities onto the motorways than is consistent with the implementation of sustainable transport policies (which are also ignored).

This is shown in detail in an analysis of the current Government proposals for rolling out Hard Shoulder Running on some hundreds of miles of motorway. A simplified assessment says that this would provide benefits of increased speed at much lower cost than motorway widening, and only very small increases in carbon emissions. The DfT estimates a resulting 17% increase in traffic speed, ie faster by 10 mph. But on closer examination, the figures show that the forecast peak period motorway speed, even with the full programme of hard-shoulder running and widening successfully in place, would actually be 2 mph less in 2025 than it was in 2003, not 10 mph more. The ‘benefit’ only resides in the statement that otherwise the speed reductions would be even greater.

But is this true? At the same time, the Government very sensibly has a programme of encouraging towns and cities to adopt sustainable transport policies which reduce traffic growth, and in some places reduce the volume of traffic. This would in turn reduce the stress on motorway traffic, yet is assumed not to exist (or, not to be successful) in the forecasts.

A different sort of appraisal – a more genuinely strategic one – is suggested. This would treat motorways and trunk roads not as a separate network, but as part of an integrated transport system which includes alternative methods of transport between the cities, and alternative local and regional policies within and around the cities. Appraisal of projects which are aimed at providing extra capacity on the motorways would proceed from the new traffic patterns which will arise from the new policies, not from extrapolation of the old trends which the Government is seeking to change.
PART ONE: THE HARD SHOULDER RUNNING PROPOSALS

1. In January 2009 the Department for Transport published a report titled ‘Britain’s Transport Infrastructure Motorways and Major Trunk Roads’. This is a short report (11 pages of text and 3 maps), and three very small tables of results. It reported that hard shoulder running (HSR) had been compared with motorway widening, and found to have very nearly the same effects, providing about the same amount of extra capacity, and about the same improvement in congestion, but at considerably less cost. It may also have been thought (though this was not discussed) that it could also be achieved with less hassle and opposition. In any case, it was clearly the favoured solution.

2. The reported effects of HSR did indeed seem impressive. Model forecasts had calculated that average peak period traffic speeds in 2025 would be increased by a massive 17%, or nearly 10 mph. It was accepted that estimated carbon dioxide emissions would be increased – but only by 0.4%. At face value, the contrast between the massive speed improvements and tiny carbon dioxide deterioration is obvious, and so there were no strong environmental caveats in the preference to adopt these policies.

3. But less than a month earlier, just before Christmas 2008, the DfT had published a more technical and less widely remarked report, titled ‘Road Transport Forecasts 2008: Results from the Department for Transport’s National Transport Model’, in which it was reported that peak period motorway traffic speeds in 2025 – even with hard shoulder running already in place - would actually be 3.5% less than in 2003 (the base year), about 2 mph slower. Rising congestion was predicted, with continuing year-by-year deterioration of traffic speeds. Even with a full programme of hard shoulder running or motorway widening in place, people would be driving slower than now, not faster.

4. So which is it? With hard shoulder running in place, would people be driving 10 mph faster or 2 mph slower?

5. Closer analysis will reveal that there is not a technical difference between the figures in these two DfT documents (there are some minor discrepancies of assumption and definition, but they have little effect and are not material to the policy assessment). They are two different ways of presenting the same underlying analysis. But those two different
presentations raise issues which are at the heart of the whole problem of the relationship between policies targeted at very specific sections of very specific motorways, and policies targeted at making improvements in travel overall.

6. Beneath the presentational differences are theoretical aspects of appraisal, but there is a broader issue underpinning both. It is about what people expect when they see the words ‘benefit’ or ‘improvement’ in transport: in normal language, both imply that something is getting better. This issue of presentation is therefore highly important politically, since if people believe they are being promised improvements and actually they are being given deterioration, there is an unstable basis for consensus and consent.

7. In practical terms, the question is therefore whether policies can be defined which would promise (and deliver) genuine improvements, which people perceive to be making their lives better, and technical methods of appraisal which distinguish that case from slowing down the rate of deterioration? In medical terms, does the patient have a curable condition and will be restored to full health with proper treatment, or is this a degenerative disease with no cure in sight, only help in slowing down the deterioration? That is the main subject of this paper.

**Background to the Current Proposals for Hard Shoulder Running**

8. The then Government’s 1989 White Paper ‘Roads to Prosperity’ proposed a very large scale programme of increasing the capacity of motorways and interurban trunk roads, intended to keep pace with a doubling of traffic volumes expected in the forecasts. Over the following three years this programme was reconsidered as it became apparent that even such a programme, or any alternative within the realm of reason, would not be sufficient to overtake the traffic growth and reduce congestion. At the same time, it did not have the same degree of popular support that had previously existed.

9. By the mid 1990s both Government (then Conservative) and opposition parties emphasised the need to manage demand rather than attempting to “build our way out of congestion”. This thinking led to the (Labour) 1998 Transport White Paper ‘A New Deal for Transport’, which at the time of its launch had considerable broader support.
10. Two years later, the Ten Year Plan for Transport 2000-2010 suggested a ‘delivery strategy’ in which it was envisaged that a major increase in infrastructure building (both road and rail) together with an assumption of around 20 successful charging schemes (road use and/or workplace parking) would be successful.

11. In the early stages of the suggested Ten Year Plan, a series of multi-modal studies for specific areas and corridors were carried out, such as the ‘Midman’ study of the corridor connecting the Midlands and Manchester in 2002. From this, the Government announced in July 2006 that it would widen the M6 between junctions 11a and 19. By 2007 it was expected that the Government would embark on a major programme of motorway widening, including the M6. It was planned that a Business Case for M6 widening, and some other schemes elsewhere in the network, would be produced by the Highways Agency by the Summer or Autumn of 2007.

12. However, the Business Case never appeared. It was overtaken by quite different important developments in Government transport thinking, including the Eddington and Stern reports. The DfT published ‘Towards a Sustainable Transport System’ in October 2007 which in principle proposed a multi-modal approach to corridors. The Committee on Climate Change published its first report in December 2008, and the Government supported its proposed target of an 80% reduction in carbon emissions by 2050 compared with 1990.

13. During this period, DfT announced that it would be examining hard-shoulder running as an alternative to widening. Trials were carried out on the M42, and in January 2009 the then Secretary of State for Transport, Geoff Hoon, announced that most widening plans were to be replaced with a programme of hard-shoulder running.

Description of the Proposals

14. The 2009 report proposed increasing the capacity on the ‘Strategic Road Network’ (the inter-urban Motorways and some trunk A roads) with the equivalent of an extra 520 lane miles, of which 340 lane miles would be by hard shoulder running (HSR), and the rest by widening, with plans to roll-out hard shoulder running across the core motorway network in a series of phases.
15. The proposed schemes are contained in a key map which is reproduced below.

![Figure 3: The National Roads Programme](image)

16. The Department reported that a pilot on the M42 had shown that concerns about safety could be solved, and that:

   “results to date indicate benefits in relation to traffic flow, journey time reliability, emissions per vehicle and compliance, at considerably lower cost than widening schemes” (para 9)
“...more detailed work suggests that in all cases where there was an originally a proposed widening solution, HSR would provide a feasible alternative; and that on average it would save around 40% of capital costs... HSR schemes provide the majority of benefits that widening would, generally at a lower cost to the environment. Combining this with the fact that capital costs are significantly lower means that the value for money of HSR is generally higher” (para 20).

17. The results of an appraisal are shown in two key small tables\(^1\) of figures, summarising the main effects of the programme. One shows the effect on peak period speeds, and the other shows the effect on carbon dioxide emissions. (Other potential impacts are referred to, but not given in the report).

<table>
<thead>
<tr>
<th>Table 2: Peak period speeds (mph) and % increases</th>
</tr>
</thead>
<tbody>
<tr>
<td>HSR schemes only</td>
</tr>
<tr>
<td>Reference Case</td>
</tr>
<tr>
<td>55.2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 3: Carbon dioxide (million tonnes) and % increases</th>
</tr>
</thead>
<tbody>
<tr>
<td>all roads England</td>
</tr>
<tr>
<td>Reference Case</td>
</tr>
<tr>
<td>94.9</td>
</tr>
</tbody>
</table>

18. This reports that speed would be 17% higher with HSR, whereas CO2 emissions would be only 0.4% higher.

19. In fact this statement could be badly misleading, as it arises from comparing speed changes expressed as a percentage of traffic on those sections of motorway which

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\(^1\) For ease of checking with the original sources the original table and figure numbers are used, rather than renumbering for this paper. To avoid confusion, they will be referred to by paragraph or page numbers in the discussion.
would be widened, with CO2 changes expressed as a percentage of all traffic on all roads in England. Naturally the carbon impacts seem much smaller than the speed benefits, and the driver benefits of faster journey times seem to clearly outweigh the slight disbenefit of a marginal CO2 increase.

20. In reality the benefits for drivers are elusive, as discussed below, and the CO2 impacts are real. The Appendix recalculates the comparison to make an approximate estimate on a like-for-like basis, (i.e. for the network as a whole in both cases). The reported speed changes and the reported CO2 changes are then of rather similar order of magnitude to each other.

21. Although this means of presentation makes objective assessment of the effect of hard-shoulder running on greenhouse gas emissions difficult, it is only part of a much bigger issue of assessing the proposals. The core problem with the approach the Department for Transport has taken with hard-shoulder running arises from its standard implicit presumption that ‘things getting worse but not so quickly’ can be appraised in exactly the same way as ‘things getting better’.

22. It is vitally important to distinguish between these, not least because of the effect on public opinion: if people are promised ‘improvements’ but their experience is that conditions are getting worse, then no matter how heavy are the volumes of economic calculations, people will not perceive this as an unambiguous ‘benefit’. This is now considered in detail.
Scrubinising the case for hard-shoulder running

23. Before considering wider ramifications, the simple question that the road user (and the transport planner) want to know is – *are the speeds with hard-shoulder running going to be better than at present, or worse?*

24. This, naturally enough, is the way in which political discussion is carried on, promises made, and policies viewed. I think that anybody other than a professional road planner (and perhaps even some of them) would think that is the question that the hard-shoulder running report is answering. The calculations look as though they answer that question, and even phrases like ‘improvement’ have that connotation.

25. But this language is misleading. Instead of dealing with testable statements about relatively easy concepts, such as whether speeds increase or decrease, it sets out to address a quite different, rather elusive, and much more philosophical question: *are these speeds going to be better than they might otherwise be if we don’t do anything about it?*

26. Thus the label of the table at para. 17 refers to ‘% increase’ in speeds due to HSR and widening. From a starting point of 55.2 mph HSR is estimated in 2025 to increase average peak period speeds by 17% (to roundly 65 mph) on the treated sections of motorway. However, the number from which the increase is calculated is not the current speeds, or the 2003 speeds from which the forecasts start.

27. The increase is a comparison against the ‘reference case’, in 2025. This is the speed which the Department for Transport has calculated *would apply in 2025 if no improvements went ahead other than those already under construction, and some planned regional schemes; and if the historical growth in car ownership, number and length of trips continued at rates based on past trends, throughout the period of forecasts and beyond. Crucially, there is no allowance at all made for the build-up of effect of any of the local, regional or national policies, now being actively promoted by the Government, which are intended to change travel choices, and hence the growth rate of traffic, and hence in turn the level of congestion.*
28. The question of how the with-HSR speeds compare with the present is not answered, or even addressed, in the January 2009 report. But some of those technical details are in fact available in Road Traffic Forecasts 2008, the report which had been published on the DfT website just before Christmas. Although that report appears to be just the latest revised forecast that the DfT produces from time to time, it has 6 pages of the estimated effects of HSR, with the key table reproduced below².

### Traffic Effects of Hard Shoulder Running (DfT December 2008)

<table>
<thead>
<tr>
<th>Road Type</th>
<th>Time Period</th>
<th>Data Item</th>
<th>Reference Case</th>
<th>Planned Widening</th>
<th>Equivalent HSR</th>
<th>Priority HSR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motorway</td>
<td>Off-peak</td>
<td>Congestion s/vkm</td>
<td>79%</td>
<td>57%</td>
<td>71%</td>
<td>57%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Traffic Bvk</td>
<td>28%</td>
<td>28%</td>
<td>28%</td>
<td>27%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Speed</td>
<td>-0.2%</td>
<td>-5.0%</td>
<td>-0.1%</td>
<td>0.1%</td>
</tr>
<tr>
<td></td>
<td>Peak hours</td>
<td>Congestion s/vkm</td>
<td>83%</td>
<td>56%</td>
<td>58%</td>
<td>41%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Traffic Bvk</td>
<td>24%</td>
<td>24%</td>
<td>24%</td>
<td>25%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Speed</td>
<td>-7.5%</td>
<td>-5.0%</td>
<td>-5.2%</td>
<td>-3.5%</td>
</tr>
<tr>
<td></td>
<td>Inter-peak and weekends</td>
<td>Congestion s/vkm</td>
<td>110%</td>
<td>68%</td>
<td>77%</td>
<td>56%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Traffic Bvk</td>
<td>28%</td>
<td>28%</td>
<td>28%</td>
<td>28%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Speed</td>
<td>-3.9%</td>
<td>-2.2%</td>
<td>-2.6%</td>
<td>-1.7%</td>
</tr>
<tr>
<td></td>
<td>All periods</td>
<td>Congestion s/vkm</td>
<td>91%</td>
<td>59%</td>
<td>64%</td>
<td>46%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Traffic Bvk</td>
<td>27%</td>
<td>27%</td>
<td>27%</td>
<td>27%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Speed</td>
<td>-4.1%</td>
<td>-2.5%</td>
<td>-2.7%</td>
<td>-1.8%</td>
</tr>
<tr>
<td>Major</td>
<td>All periods</td>
<td>Congestion s/vkm</td>
<td>24%</td>
<td>24%</td>
<td>24%</td>
<td>24%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Traffic Bvk</td>
<td>20%</td>
<td>20%</td>
<td>20%</td>
<td>20%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Speed</td>
<td>-4.0%</td>
<td>-4.0%</td>
<td>-4.0%</td>
<td>-4.0%</td>
</tr>
<tr>
<td>Minor</td>
<td>All periods</td>
<td>Congestion s/vkm</td>
<td>19%</td>
<td>19%</td>
<td>19%</td>
<td>19%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Traffic Bvk</td>
<td>18%</td>
<td>28%</td>
<td>18%</td>
<td>18%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Speed</td>
<td>-3.3%</td>
<td>-3.3%</td>
<td>-3.3%</td>
<td>-3.3%</td>
</tr>
<tr>
<td>All Roads</td>
<td>Congestion s/vkm</td>
<td>22%</td>
<td>21%</td>
<td>21%</td>
<td>21%</td>
<td></td>
</tr>
<tr>
<td>All Roads</td>
<td>Traffic Bvk</td>
<td>21%</td>
<td>21%</td>
<td>21%</td>
<td>21%</td>
<td></td>
</tr>
<tr>
<td>All Roads</td>
<td>Speed</td>
<td>-2.9%</td>
<td>-2.7%</td>
<td>-2.7%</td>
<td>-2.6%</td>
<td></td>
</tr>
</tbody>
</table>

s/vkm = average delay (seconds per vehicle kilometre; Bvk = Billion vehicle km.

29. This table goes a long way to addressing the questions unanswered in the main report, and the following table is my reduced form of some selected figures from the 2008 forecasts.

**Summary of DfT forecasts of Speeds in 2025, with HSR, compared to 2003**

<table>
<thead>
<tr>
<th>Road type</th>
<th>Reference Case (Do very little, 2025 compared with 2003)</th>
<th>Equivalent HSR 2025 compared with 2003</th>
<th>Priority HSR 2025 compared with 2003</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motorways, peak</td>
<td>-7.5%</td>
<td>-5.2%</td>
<td>-3.5%</td>
</tr>
<tr>
<td>Motorways, all periods</td>
<td>-4.1%</td>
<td>-2.7%</td>
<td>-1.7%</td>
</tr>
<tr>
<td>All roads</td>
<td>-2.9%</td>
<td>-2.7%</td>
<td>-2.6%</td>
</tr>
</tbody>
</table>

30. We can now put this in context. Taking all the figures at face value, the full picture of how travel would actually be different in the context of full delivery of the larger hard-shoulder running package is as follows:

31. On the HSR sections of motorway, peak period speeds are described as increasing, by 16% or 17%, compared with the ‘reference case’. We are not told the 2003 speeds for the specific sections where HSR are applied, but if they are typical of the motorway network as a whole, this means that, in the reference case, peak period speeds are expected to go down by 7.5% from 2003 to 2025.

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This work is clearly the basis of the January report, but the figures are slightly different. It refers to ‘Equivalent HSR’ running in both directions on 217 km of motorway, and ‘Priority HSR’ running in both directions on 397 km, representing 270 miles of hard shoulder lane and 493 miles respectively. The January report said 520 lane miles of extra capacity of which 340 are due to HSR. There was evidently some decision after the model tests to select a different set of sections for HSR. As far as I can judge, these differences do not affect any of my overall conclusions reported here, but the percentage changes on a like-for-like basis would be modified somewhat.
32. This would mean that on the HSR sections speeds would be about 7% or 8% higher than in 2003 (i.e. down by 7% and then up by 17% from this lower base). In practice, the HSR sections may well have been chosen as priority partly because traffic speeds on those particular sections are expected otherwise to go down more than average (this is not stated). If so, and we assume this reduction is 10%, then after the hard-shoulder running programme speeds would be about 5% higher than in 2003.

33. So on the HSR sections it is estimated that speeds would be about 5%-7% higher than in 2003, around 2 or 3 mph.

34. However, there are few if any journeys taking place only or mainly on HSR sections. In most cases, after ‘speeding’ through the newly-widened section, the driver will then come to a section without hard-shoulder running and be subject to the speeds on the rest of the motorway network, which will be lower than 2003.

35. Thus taking both HSR and normal sections together, the peak period speed of motorway travel as a whole, with hard-shoulder running, will be 3.5% slower than in 2003, about 2 mph.

36. However, that is not the end of the story. There are very few journeys which are entirely carried out on motorways⁴. In most cases journeys start and end on major and minor roads: these are also forecast to be experiencing reduced speeds due to traffic growth generally. The overall speed of all traffic on the whole network is roundly 34 mph. This is forecast to reduce by 2.9% to 33 mph by 2025, and of course taking travel as a whole, the effects of HSR on the selected sections of motorways make no detectable difference to this. They do however make a difference which is detectable in the modelling: overall speed is forecast to be 0.3% higher with HSR than it would be in the reference case (or about one tenth of 1mph), and about one mile an hour slower than in 2003.

⁴ Those might include some service traffic, e.g. between services, some maintenance, and the very small number of people who actually live on slip road and are travelling to a destination with a similar location.
37. Thus the DfT forecasts are that for all vehicle travel on all roads in England, with Hard Shoulder Running, speeds would be 0.3% higher than in the reference case, but 2.9% slower, (about 1 mile an hour) than in 2003.\(^5\)

38. The figures show that HSR does not enable people to travel faster; it reduces the pace of deterioration in speed that would occur due to unmanaged traffic growth. The problem has essentially arisen because of the aim to achieve a small ‘improvement’ against a background of a substantially larger deterioration, which outweighs it. This is an integral part of the way in which the ‘reference case’ is defined. Used in this way, it becomes an entirely pessimistic and determinist approach which makes the assumption that Governments are at the mercy of ever rising traffic growth, unable to introduce policies to manage demand or provide alternatives to car travel.

39. It is important to note that the forecast increases in congestion do not arise simply because of the inadequacy of hard shoulder running as compared to, say, full scale widening. Almost exactly the same results were forecast even with a very much more expensive full widening programme, which would have added additional lane capacity to various motorways, including the M1 and M6. This option produced almost identical predictions of worsening traffic speeds to the equivalent hard-shoulder running option, and was, in many categories, trumped by the priority widening option.

40. The DfT have not in fact done full justice to their own procedures by using the ‘reference case’ in this way. A better interpretation (and one which is fully compatible with the Government’s support for sustainable transport strategies) is that the reference case is only to be used as a temporary staging post in a sequence of calculations: roughly (a) this is what would happen if we do nothing about it, so (b) here are some alternative strategic policies which will change (i.e. improve) the trends, and hence implicitly (c) on the basis of the new, improved forecasts, we can then test alternative specific interventions such as hard shoulder running. There would be a different balance of mode use, traffic levels, congestion and emissions.

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\(^5\) Note that the traffic figures refer to all motorways and rural A roads in Great Britain, whereas the congestion figures refer to a selection of the Motorway and Trunk roads in England only. The traffic figures are given in numbers, and the time series of congestion as a diagram. The latest quarter results are provisional. These caveats do not seem to challenge the main features of the results cited.
41. There is another way forward. The transport planning which led to hard-shoulder running started from the assumption that things were going to get much worse, and tried to alleviate the impacts. What if we set out to design a different type of strategy – one which actually makes travel conditions better rather than just ‘less worse’? What would we have to consider, and what interventions might we come away with – and, crucially, would we be able to halt and reverse this cycle of gridlock and traffic?
PART TWO. A SUSTAINABLE APPROACH TO CORRIDOR PLANNING

42. It is clear from the preceding chapter that the approach currently offered in the assessment of Hard Shoulder Running does not offer an improvement to interurban congestion, because it does not offer a respite from traffic growth. Traffic speeds will get worse, even with a full programme of motorway widening or hard-shoulder running, and journey times will decrease accordingly.

43. But that does not have to be the outcome. We can – and should – plan for a transport system where journey reliability increases and congestion decreases and both are perceived as real changes for the better. But doing so requires a new approach to transport planning which takes greater account of the impact of cities and local traffic on the strategic network.

What approaches has the Government taken?

44. Central and local Government have taken a variety of different approaches to examining transport problems and proposing solutions. In the main, three rather different important approaches have been followed in practice:

(a) To look at the specific effects of proposed extra capacity only in the close neighbourhood of the project. This is widely recognised as a thoroughly bad practice, which can lead to very misleading results, because effects on and from the rest of the network, or more widely, are ignored. It does however live on in attempts to solve congestion one bottleneck at a time.

(b) To look at the whole picture but for a single network. This gives a somewhat broader picture of the results, mainly said to be relevant if one can reliably assume that other modes, places and policies are unaffected and irrelevant. However, it is still partial, as effects on or from other networks are ignored, and so are difficulties which can be caused such as pouring extra traffic from expanded motorways onto an unexpanded local road network that cannot cope with it.
(c) To look at a whole corridor, e.g. London to Manchester, including all the ways of getting there. These approaches are sometimes called ‘multi-modal’, and they can usefully consider – say – the roles of rail and motorway travel between cities, but they still do not consider the cities themselves, and what is happening there. They would be more suitable if one can assume that the large majority of traffic on the strategic networks is itself already strategic (i.e. there is no substantial volume of local traffic using the same systems), and that long distance travel is somehow fixed in volume and pattern; and that what happens within the cities has no effect on what happens between them.

45. But it is important to note that all three start out from the presumption that they cannot reduce or manage traffic growth, and result in fragmented packages which tinker around the edges, caught between a desire to add capacity to accommodate growth, and the recognition that we cannot (or cannot afford to) build our way out of congestion.

**Future traffic growth predictions**

46. This presumption seems completely inadequate when compared against the forecasts predicted in the Department for Transport’s Road Traffic Forecasts report of December 2008.
47. This analysis starts off with a reference case, which shows traffic expected to recover from a temporary fall and increase indefinitely into the future. Carbon dioxide emissions stabilise (but do not fall), while other emissions continue to fall. Traffic by 2025 would be 32% higher than in 2023, and the measure of time lost in congestion for all roads in England would increase by 37%.

48. The traffic growth is forecast to occur for just about all roads, and all classes of traffic. Thus London and other large cities, for example, are forecast to have a 30% increase in traffic by 2025, and rural areas a 35% increase. Motorways and other trunk roads are forecast to have a 37% increase.

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6 Although the forecast congestion delay increases more than the forecast traffic, as expected, it oddly does not do so as much as has been observed in the last three years. The May 2009 DfT figures show that traffic levels on motorways and rural ‘A’ roads in Great Britain decreased by 4% between the first quarters of 2008 and 2009. As a result, the Department’s preferred measure of congestion (a measure of delay on the slowest 10% of journeys) improved by 12.3% on the strategic road network in England. By comparison, during the period from March 2006 to July 2007 (before the change in trend), the comparable figures are approximately that traffic increased by about 1% and the measure of congestion got worse by over 12%. Thus a small change in traffic volume resulted in a very much larger change in the level of congestion. The difference is smaller in the forecasts, which is probably due to some ‘damping’ factors in the technical speed-flow (or cost-volume) relationships used in the model, which do not handle very bad traffic conditions as accurately as the real world. So if this traffic growth actually did occur, the effects on congestion would probably be worse than forecast. However in this paper I will accept the Department’s own forecasts rather than add another dimension of complexity.
49. It is worth restating that this traffic growth assumes a number of factors, none of which is guaranteed. Firstly, it assumes that current levels of pricing remain roughly constant, so that motoring in the future is not substantially more expensive than it is at present. Secondly, it assumes that current patterns of land-use continue, so that car-based development remains the primary template. Thirdly, it assumes that central or local government does not act to reduce demand, whether through affecting capacity provision, pricing, public transport, planning or similar. Fourthly, it assumes that the increase in traffic (and the congestion predicted to follow) does not have any greater effect on damping demand in the current and future political and social context than it has had in the past.
**Viewing the network as a network**

50. The effects of a 30% increase in traffic are shown in two maps which include urban, rural and interurban roads together.

51. As expected, the assumption of continued increase in traffic without any policy response to that growth, leads to a deterioration of congestion over the whole network.

52. But when we see the whole network, the most important hot spots – the red and orange roads on which delays are greatest – are simply not the main motorway flows. They are the urban areas, especially the big cities, whose location is virtually defined by the delay concentrations.

53. The problem of delay, both in the 2003 starting point and the growth from 2003 to 2025, is not primarily on the motorways, it is in the cities. Put in another way, it is not a number of separate stretches of roads, or corridors, it is spread over an area. It is not a problem in one dimension, but in two. The result is that any attempt to plan interventions to reduce congestion which do not take account of the impact of these congested urban areas, is partial and superficial.
The Problem of the Motorways Can Only be Understood by Consideration of the Cities they Connect

54. The above maps clearly show that the most intense areas of congestion, now and expected in the future (in the absence of policy intervention), are not on the motorways but in the cities. Further, the great majority of traffic on the motorways has an origin or a destination (and usually both) in the cities and other urban areas at each end, and en route.

55. A significant proportion of the traffic, especially in the sections close to the urban areas, is not inter-urban: it is using the motorway as a section of the urban or suburban road network. There is also the impact of increased strategic traffic flow on the local roads which feed into the national network; it does not make sense to expand motorway capacity to provide for more traffic than the local roads at each end can cope with.

56. Finally, the policies developed in the cities to deal with their own problems will in turn affect the pattern of flows between them.

57. For all these reasons, it does not make sense to try to develop policies for motorway congestion that are not rooted in an analysis of the expected traffic trends in the cities and towns.

Perceptions of congestion

58. It is interesting to note that the idea of congestion being a problem of urban areas rather than motorways corresponds quite well with research on public attitudes. This is shown in a review of evidence on public attitudes published by the DfT in Lyons et al (2008)⁷.

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59. There is little evidence of an increasing perception of motorway congestion being a problem to respondents (as distinct from general statements about congestion being an important problem for the country, which are generally higher). The most likely explanation for this – in spite of evidence discussed above that measures of congestion have actually got worse over this period – is that people have adapted to ‘cope with’ congestion by measures ranging from minor changes in behaviour to the use of in-vehicle music and other methods to counteract boredom or irritation.\(^8\)

60. Thus the focus on average motorway speeds or delays does not seem to correlate very closely with either public perceptions of ‘what is the problem’, or analytical descriptions of the location of delays on the network. Conversely it makes sense to focus on where people most experience congestion: the urban conurbations which, as the DfT’s model showed us, are most at risk to rising congestion levels.

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\(^8\) It is rarely said, but perhaps it is right also to note that the differences in congestion delays – which sound impressive when expressed as percentage changes – do not actually represent very big changes in conditions. The difference of a mile an hour in average traffic speed is fairly small by comparison with the random day-to-day variation due to the effects of weather, incidents, or the volume of traffic, and often not perceived at all.
Corridor planning for road building

61. It is clear from the above discussion that any consideration as to future transport needs should take account of the whole pattern of traffic, within, on the edge of, and between cities. There is an irony that in considering the levels of congestion on motorways, the forecasts do indeed include that local traffic, travelling on motorways, which is not ‘strategic’ in any real sense. (If it wasn’t for that traffic, there are only a very few stretches of motorway that would be congested solely as a result of long distance traffic, for which there would be entirely adequate capacity). But then the effects of any and all policies in cities and regions which change the volume of that traffic are ignored.

62. Consider the maps referred to above, and the different pictures they suggest when seen side by side. Both of the maps below represent the Department for Transport’s predictions for congested roads in 2025. The one on the left accompanied the hard-shoulder running report, and shows only the strategic road network.

63. Considered on its own, it appears to be making a persuasive qualitative argument for adding capacity to the sections marked in red. But that does not give an accurate image
of the nature of the problem. The map on the right depicts a much wider range of roads, and makes it obvious that it is the cities, not the strategic network per se, which congestion will be most problematic.

64. A third map gives a different presentation, showing that the Department for Transport had indeed taken a multi-mode corridor on board: this approach, outlined in Delivering a Sustainable Transport System, is far more multi-modal than the hard-shoulder running report.

65. However, while this is a marked improvement on the very linear thinking which produced the hard-shoulder running programme, it still fails to take account of the impact of urban traffic policy on the strategic network. Instead it focuses on purely strategic traffic, flowing from ports to airports via major conurbations, and gives no
explicit attention to the large volume of shorter journeys which contribute substantially to the delays experienced by the longer journeys such as the international freight traffic which contributes to economic trade.

66. Thus the outputs of such a planning approach like the hard-shoulder running report, is to recommend largely ineffective additional capacity for almost unmitigated demand. The results are a continued general decrease in journey times, no change in the trajectory of traffic growth (or even some small increase in it), and no observable improvements for road users.

67. Although this report has not carried out a wider comparison of Government forecasts and assumptions with those of other agencies, it is worth making a brief comparison with work published by the RAC Foundation titled ‘Motoring Towards 2050: Roads and Reality’\(^9\), in which there are some differences in both the assumptions and the modelling details as compared with the DfT forecasts. The main policy focus is to assess the impacts of an increase in road capacity considerably larger than the DfT’s plans, and the implementation of a nationwide road pricing system, together or separately. The same approach as the DfT’s is followed, of treating the benefits of ‘slowing down the pace at which things get worse’ as conceptually identical to ‘making things better’. Although the actual forecast numbers are not given, close inspection of some maps and graphs suggests exactly the same feature. Figure 4.3 on page 90 of the report constructs a ‘base case’ in which traffic speeds get slower over virtually all major urban and motorway networks from 2010 to 2041, with reductions in speed in and between the English cities ranging from 1% to 17%. Then a series of figures starting with Figure 4.4 on page 96 appear to show that without a nationwide system of road pricing, even a considerably expanded programme of motorway construction is not sufficient to reverse this deterioration, but rather is forecast to reduce the pace of deterioration. (This reduction is, as in the DfT’s calculations, accorded a very considerable ‘benefit’ in cost-benefit terms). The RAC methodology has less potential for considering interaction between policies in the cities and on the motorways than the DfT method, in principle, offers.

**A different concept of corridors: The ‘Barbell’ model**

68. A much more useful approach is to see the ‘corridor’ (including all modes) as being intrinsically linked to the cities at either end. The picture looks somewhat like a Barbell:

69. The point is that as long as the corridor is considered as stretches of motorway in isolation, solutions are seen in terms of their own traffic flows. But if it is seen as part of the properties of two (or more) urban areas, then the policies in those areas affect the flows on the corridor, and the policy focus is more on areas than on lines. Thus extending the diagram, the policy implications of the existing and proposed approaches are contrasted below.
What this approach would mean in practice

70. Of course, only the DfT has the resources, data and capability to carry out the substantial work involved in such an appraisal. But we offer here some observations of how the approach might be developed in practice, and some results of earlier studies which suggest it would make a real difference.

What sort of measures might we implement?

71. The last twenty years, in the UK and worldwide, have seen a rich growth of experience of how to undertake such demand management. This can include:

- pricing (i.e. making sure that the cost of road use and/or parking is reasonably well related to the costs they impose);
- smarter choices in which ‘soft’ methods of travel planning, information, marketing and advice enable people to see choices they had not been fully aware of;
- improved infrastructure and operating conditions for public transport, walking and cycling;
- reallocation of scarce road capacity to give priority to the most efficient, productive or socially needy users of it;
- real-time information and control systems including dynamic traffic control;
- better land-use planning enabling origins and destinations to be closer together, or in locations which are easier to provide capacity for; and
- increased use of advanced telecommunications systems, whether for teleworking, online-shopping, or transport system management.

72. The instruments to implement these systems are continually being improved, and the evidence base on their effects now includes some thousands of experimental and indeed well-established interventions world-wide, including well-known cases like the early large scale pedestrianisation in German city centres, best-practice traffic calming in the Netherlands, metro and high speed rail experience in France and many other countries; congestion charging in London and Stockholm, bus and cycle lanes; ramp metering; variable speed control, and planning guidelines. Taken together, these
demonstrate a great deal of practical evidence about circumstances in which traffic reduces by up to about 20% or 30% (in real terms, not by comparison with an invented base-line), with related positive effects on congestion, health and quality of life. Greater decreases are discussed but with less practical evidence so far.

73. Similarly, the Department for Transport recently released its provisional interim findings from the Sustainable Travel Towns, which showed a decrease in car trips and traffic levels, with a corresponding increase in walking, cycling and public transport patronage.

74. The effects also now include many studies of the advantages such an approach has on the speed and reliability of travel, reduced environmental damage, and improved health. It is now established that travel choices do change, sometimes very substantially, and that such policies can be made popular and effective.

75. There are, of course, differences of view about the relative attractiveness of different instruments within this package, and on the most effective way of putting such a strategy together. But the underlying approach is to be seen among a very wide body of disparate stakeholders, and it certainly is at the heart of the Government’s Delivering a Sustainable Transport System.

76. A number of Government studies have begun considering this wider approach to corridor planning as part of their transport appraisal. These studies, and their findings, are considered in the next section.
Elements for a ‘Barbell’ appraisal of the West Midlands and North West Conurbations, and the Routes between them

77. Three reports, drawn from two Multi-modal studies reports in the early 2000s, and separate city studies for the West Midlands more recently, give an indication that the proposed approach would actually make a difference.

The MIDMAN multi-modal study

78. The first case, looking at a broader range of policy options, was the MIDMAN multi-modal study\(^\text{10}\) (West Midlands to North West Conurbation) reporting in 2002. One of the options considered had high levels of restraint including tolling, junction closures, and significant public transport improvements; in other words, this option set out to manage demand, not to provide for the forecast levels of unchecked growth.

79. The MIDMAN study suggested that the particular interventions considered would result in relatively small changes in total screenline flows – a reduction of 5% in 2011 and 2031 – but the same policy package would result in a much greater reduction of flows on the M6, by 43% in 2011 and 34% in 2031. Although traffic overall would not fall too much, the strategic network would see substantial benefits as the volume of shorter trips on the network decreased.

80. The report produced the following map, which shows the impacts of one of the different options.

\(^{10}\) [http://www.dft.gov.uk/pgr/economics/rdg/multimodal/mmsinfrastructurechargingsem5496?page=2](http://www.dft.gov.uk/pgr/economics/rdg/multimodal/mmsinfrastructurechargingsem5496?page=2)
81. The heavy green line, going north from Birmingham, shows a substantial reduction in traffic flows (and hence congestion), as a result of the proposed policy interventions. This is the M6 to Manchester; the very road which the DfT was preparing to spend billions of pounds widening to cater for increased demand.

82. The relevance here is not necessarily that the tested policy package would be suitable for the current circumstances nearly a decade after the work was done, but quite
simply that a policy test existed whose effect were to reduce motorway traffic volume - mostly by taking shorter distance traffic away and leaving the ‘strategic’ traffic to get the benefit of higher speeds.

**The South-East Manchester Multi-Modal Study**

83. The second, carried out at the same time, was the South East Manchester Multi Modal Study, which reported in 2001. It was a similar though not identical study, focussing more on the policies within a broadly defined region which included significant stretches of the north-south motorways.
One of the differences between then and now was the rather dismissive approach that was taken then to what were then called ‘soft’ measures, now ‘smart’ ones: travel planning, personalised advice, marketing, and associated promotion of walking, cycling and public transport supported by relevant service improvements. The ‘Smarter Choices’ report in 2004 persuaded the DfT broadly to double its assessment of the achievable potential (representing some 11% reduction in traffic volumes nationally, but up to 20% in the most congested conditions such as urban peak periods). So the specific estimates made in the 2001 study (at which time Government guidelines suggested the effect of Smarter Choices, then called ‘Soft Measures’ might be 5%) would not be the same as those made now. But there is some continuity of policy concerns throughout the period, and the general approach is therefore robust.

‘Tackling Congestion, Delivering Growth’

Bringing the story up to last year, discussion about transport policy in the West Midlands went through a number of stages, most recently around definition of its demand management measures, encouraged by the DfT, as part of its Transport Innovation Fund bid. (Like Manchester, though in a lower key way, they decided not to propose the road pricing policy which had been worked up in technical studies).

The interesting thing is that in the course of these studies they developed what can be seen as one end of the ‘Barbell-shaped’ corridor assessment proposed here. This was contained in a 2008 report from the consortium of local authorities in the region.

The assessment was of a package of measures for West Midlands (not for the route from the West Midlands to Manchester): road pricing for Birmingham City Centre, related charges described as a ‘junction hopping’ charge for parts of M6 and M5, bus rapid transit, rail improvements, the application of some ‘smarter choices’ measures, and some highway improvements.

The definition of this package was substantially defined in terms of the urban needs of the conurbation, both in terms of mobility and business success. The interesting point

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89. The green lines show roads on which a reduction in traffic flows (and a consequent increase in speed) are expected, compared (as in the DfT analyses) against a ‘do-minimum’ baseline. It is the heavy green line heading off to the North that attracts the eye: the M6, the same road that the DfT’s 2025 projection expects to become more congested, leading for calls for greater capacity, and which the MIDMAN study concluded could see reduced traffic flows given the right urban interventions.

90. In this case, there is a significant reduction of traffic load, and hence congestion, on an important part of the DfT’s designated strategic road network, produced by policies which are essentially designed to address transport policies within the West Midlands.

91. There is nothing about the West Midlands or the Birmingham area to suggest that this effect is particular to this location or could not be replicated across the country.
Principles for planning to reduce congestion

92. Thus we can outline a set of principles of how planning for motorways ought to be carried out.

• First, we acknowledge that motorways are not, of course, either the origin or the destination of most journeys. The largest part of the traffic will begin or end (or both) in towns and cities, simply because that is where most people live and the highest density of activities takes place.

• Secondly, we must embed the analysis in a policy context – entirely consistent with ‘Delivering a Sustainable Transport Strategy’ - where the base case consists not of ‘do-nothing’ but of the serious implementation of policies to use demand management measures for environmental, economic and quality of life advantage. In towns and cities, there is no serious suggestion of substantial increases in road capacity as a solution to problems of congestion. The policy debate is far more about the relative effectiveness, expense and public acceptability of different ways of managing and reducing traffic, by public transport improvements, ‘smarter choices’, reallocation of road capacity, road pricing, parking control, or some combination of these.

• Thirdly, we must consider all the alternative modes, and the effects of policies on the patterns of movement in time and space. This must include both the effects of policies within a city or region on the traffic on the strategic networks, and also the effects of policies about capacity or management of the strategic network on the urban road networks at either end.

93. These statements are not in principle in dispute between, say, the Department for Transport and the Campaign for Better Transport. They are part of the common currency of how to deal with traffic in towns, albeit of course with differences of view about how intense and fast the different measures should be implemented.

94. Now putting these points together, we come to the conclusion that a different trajectory should, and indeed will, be chosen for traffic in towns and cities, and nationwide. This in turn will have an effect on the baseline forecasts for traffic on
motorways. The resulting pattern of traffic will be marked by reduced congestion, and what congestion remains will almost certainly be in different places than projections based on doing nothing, or very little. This will in turn change the assessment of what additional capacity is genuinely useful on the strategic road network, and exactly where it would be.

95. The essential difference in policy terms would be twofold. Policies between cities would be consistent with those within cities. And there would be the possibility of genuinely making conditions of travel better, rather than just slow down the pace at which they get worse. These outcomes depend on using a different concept of ‘corridor’ which corresponds more closely to the real world of travel, in which the routes between towns are connected to, and affected by, the routes within towns.
Appendix 1 Comparing speed and CO2 changes on a like-for-like basis

1. In section 1, it is noted that the DfT forecasts suggest that Hard Shoulder Running would result in a 17% increase in speed and a 0.4% increase in CO2 emissions, with a strong impression left therefore that the big figure is likely to be more important than the small one. In that section it is pointed out that the speed ‘increases’ are from the point of view of the network really ‘smaller reductions’, but there is another important problem with the comparison, which is all about how careful one has to be when using percentages to be clear what figures are being used as a base.

2. There is an important difference between the two tables quoted in section X, whose significance may not be immediately apparent. It is contained in the words ‘HSR schemes only’ in the congestion effects, and ‘all roads England’ in the CO2 effects. What this means is that the impressive 17% reported for peak period speed increases in 2025 due to HSR relates to the speed only on those sections to which HSR is applied, not to the motorway network as a whole, or to all roads. This does not mean that anybody will actually experience a 17% increase in the door to door speed of their journey. The figures imply that you will travel faster along certain stretches of the motorway, but then of course revert to the ordinary speed (or worse, since there will be more traffic overall) at the end of the HSR section. You get to the next queue more quickly. The percentage improvement of the overall speed must logically be less: how much so is discussed below.

3. On the other hand, the 0.4% increase in CO2 in 2025 reported is not treated in the same way, as an increase in the peak period CO2 emitted by vehicles travelling on the HSR sections. The extra CO2 emissions, resulting from extra traffic attracted by the faster running speed on the HSR sections, are expressed as a percentage change of the total emissions on all roads, including unimproved sections of motorway, rural roads, and indeed urban roads.

4. To get a rough idea of the scale of the effect of expressing one percentage change in terms of the HSR sections of roads only, and the other in terms of all roads, we may note that there are 520 lane mile equivalents of HSR plus widening under discussion,
which is about a quarter of the length of motorways, which is in turn about 1% of the
roundly 187000 miles of public road in England. However, although motorways are
about 1% of the road mileage, they are probably about 3%-6% of the capacity in
terms of lane miles, and carry about 20% of the traffic\(^\text{12}\). Thus by expressing a
number as a percentage of traffic on HSR sections or as traffic on all roads, the
resulting number is changed by a factor of something more than 20. Converting road
length to lane length, and then taking account of the different amount of traffic on
each, for 2025, requires access to the DfT model to do precisely, and cannot be done
here, but we make an approximate calculation from the results of the December 2008
paper.

5. This observes that the overall average speed of all traffic is roundly 34 mph. This is
forecast to reduce by 2.9% to 33 mph by 2025, and of course taking travel as a whole,
the effects of HSR on the selected sections of motorways make no detectable
difference to this: overall speed is forecast to be 0.3% higher with HSR than it would
be in the reference case (or about one tenth of 1mph), and about one mile an hour
slower than in 2003.

6. Thus we can make a statement about overall speed on the whole network in the same
format as the reported statement about carbon dioxide on the whole network, in both
cases comparing the ‘with HSR’ case against the ‘reference case’ in 2025 (which is
strictly like-for-like, though perhaps not very illuminating for either). The DfT
forecasts are that for all vehicle travel on all roads in England, HSR would result in
CO2 emissions on all roads being 0.4% higher than they would be in the reference
case, and speeds being 0.3% higher than in the reference case. Alternatively, we could
make another comparable statement in which both speeds and CO2 emissions are
calculated only for the HSR sections. There is not sufficient information in the
published data to do this explicitly, but it will be similar in that the low ‘0.4%’ CO2
figure is replaced by one substantially greater. The order of magnitude of this way of
doing it will be about the same, except that explicit account would be taken of the

\(^{12}\) Transport Statistics Great Britain Tables 7.4 and 7.9
second order but possibly significant effect of higher CO2 emissions resulting from the higher speeds on the treated sections themselves.

7. The main effect of either way of doing the calculation is simply that the readers impression will be of figures applied to CO2 which are similar in order of magnitude to figures applied to speed. It does not alter the reality that HSR makes a pretty small difference to both, when compared with other more important tools of transport strategy, but it does counter the unrealistic impression that speed increases would be big, and CO2 increases would be small.

8. Thus we can conclude that the main reason why the CO2 change looks so small and the speed increase looks so big is that CO2 changes from HSR are expressed as a percentage of a large number (traffic on all roads) and is therefore small, while speed changes from HSR are expressed as a percentage of a small number (traffic on HSR sections) and is therefore big. This is not helpful for any appraisal, and could be misleading, so it would be better not to present results in this form.
Appendix 2: Extracts from various Government policy statements demonstrating that the approach advocated in this report is entirely consistent with Government objectives.

Draft Guidance to Regions on delivering a sustainable transport system 28.11.2008

http://www.dft.gov.uk/pgr/regional/strategy/dasts/dastsguidance

“The new approach will require the Department to look at its investment in transport across the piece: across modes and across city & regional, national and international networks” (para 6)

“The DfT will lead on option generation on the national and international networks, looking at how to address the strategic priorities on the national corridors and for the international gateways respectively” Para 7

“The new approach presents regions with some new opportunities to develop programmes which best support the sustainable economic and social development of the region, while taking account of the need to reduce carbon dioxide emissions” (para 11)... ...

The new approach will build on the RFA process and require regions to look at options more widely, for example a greater scope to consider rail, revenue and non-financial options, (para 15)

39. The Department intends that regional interests should be fully taken into account alongside national interests in the Department’s work on national programmes. This may be achieved, for example, by engagement of a regional stakeholder on the relevant steering groups which will oversee the national networks work, together with regular consultation with individual regions as the work develops. The precise governance arrangements are likely to be study-specific, tailored to meet the study objectives.

54. One such assumption will be related to the Government’s commitment in the Climate Change Bill to reduce greenhouse gas emissions by at least 80 % by 2050. Transport will be required to contribute towards achieving this challenging target, primarily through the reduction of carbon dioxide (CO₂) emissions1, as part of the non-traded sector (those sectors not within an emissions trading scheme). The Government awaits advice from the Committee on Climate Change, expected by 1 December 2008, on appropriate levels of the first three five-year carbon budgets to 2022 which will be set with a view to meeting the long-term target.
55. The required contribution from transport will depend on action taken to reduce emissions elsewhere in the non-traded sector. However, the

\[1\] CO\(_2\) emissions represent c. 96% of domestic transport’s greenhouse gas emissions (National Atmospheric Emissions Inventory 2006).

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challenging nature of the targets means that transport at an aggregate level will need to play a key role. For longer-term planning, the assumption should be that the greenhouse gas emissions constraints will become more challenging over time. It will therefore be important for regions to consider the impacts of their proposals on greenhouse gas emissions and to seek to reduce (and minimise) such emissions in overall packages of options.

66. The Department recognises that regions themselves are also keen to consider revenue options, not least because meeting our climate change goal is likely to demand further options to bring about behavioural change.

68. The Department is keen that options involving limited finance, for example better land use, marketing activities or traffic management, are also considered.

**Delivering a sustainable transport system, November 2008**

http://www.dft.gov.uk/about/strategy/transportstrategy/dasts/dastsreport.pdf

Para 1

Our response needs to be cross-modal and involve not only infrastructure improvements but also innovation and behavioural change.

1. For domestic transport, we shall be looking to maximise the contribution from improving the carbon efficiency of all modes of transport, encouraging behavioural change and supporting the provision of lower-emission transport. This will support freedom of choice about when and how to travel. Moreover, we can expect further progress towards our 2050 destination from road and rail electrification and the decarbonisation of electricity generation. In this timescale, non-transport factors – particularly land use planning – can also have a significant impact on the ‘what, where and how’ of transport demand.

10.
...We cannot simply extrapolate current trends, as the reversal in the long-term decline in rail demand over the last ten years shows. Rather, we must understand the drivers of demand and how they are expected to evolve.

2.3 Stern’s conclusion about the cost of averting catastrophic climate change depends critically on reducing greenhouse gas emissions in an economically efficient manner. The Government’s approach reflects this and is based on Stern’s essential elements for policy to address climate change. We want people and businesses to have choice about the transport they use, but we also want to ensure that they face the full cost of their choices, including the impact on emissions. We want to encourage low-carbon technology and improve the efficiency of all modes of transport. We also want to ensure that, wherever practicable, there are low-carbon transport options for people to choose, and also solutions, such as better planning, which may reduce their need to travel.

2.6 ... a package of measures for an urban area may involve public transport investment, demand management, promotion of smarter travel choices and the use of land use planning to reduce the need to travel.

2.15 This is why the Secretary of State announced on 29 October a programme of work under a new National Networks Strategy Group chaired by the Minister of State for Transport, Lord Adonis, to ensure that we make the best use of our national transport networks and accelerate the process of identifying where future expansion is needed. This will look at how to make best use of the existing network, for example by the selective extension of rail electrification or the wider implementation of hard shoulder running on our motorways to provide additional capacity for motorists and to give them greater reliability and choice. It will also look at the longer-term needs of our strategic transport corridors, and will consider, among other options, the case for new rail lines, including high-speed rail

3.7 The Department’s modelling projections suggest that demand for travel will continue to grow across all modes – most rapidly for air and rail. Nevertheless, the extent and rate of growth for each could vary considerably and will be influenced, among other things, by our transport policies and decisions. This is particularly important in developing our understanding of what this means for future capacity and for our goal of tackling climate change.

3.8 In the longer term, demand will also be affected by changes in where people choose to live, work and carry out leisure activity – hence the importance of making the link between transport and land use planning. A key question is whether people’s attitudes to transport, and the priority they are prepared to give it, will change as well. Increasingly, people accept there is a need for action to address climate change, but facilitating a widespread change in behaviour will require policies that encourage them to make low-carbon transport choices.
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