Executive Summary

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Road congestion is already seriously harming the environment and the economy and it will get worse. There is no effective policy in place which will improve things, and popular single solutions are often mere wishful thinking. This report objectively examines what is happening, the realistic policy options and the combination of actions most likely to work.

The road network is the principal national transport asset. Roads carry over 90% of motorised passenger travel and 65% of domestic freight movement. Growth in population, numbers of households and incomes will drive rising demand for travel. Official estimates predict that by 2041 the number of cars will be 44% higher than today and that car trips will increase by 24%. We estimate that traffic (the distance travelled by cars) will grow by 37%. So investment in, and efficient management of, our national roads should be a high priority. But it is not.

Congestion is an everyday experience, and it is growing and spreading more widely over the road network. There has been substantial underinvestment in transport systems over many years; although this is now being slowly put right on the railways. Low levels of road building have led to higher congestion and more greenhouse gases. Unless congestion is tackled, not only will journeys on the roads become even slower and less reliable than they are today, the country's international competitiveness, and hence economic growth, will be damaged. Businesses will look to locate abroad for better connections to markets, suppliers and workforces. Quality of life will suffer as the increasingly diverse variety of journeys which are an important part of modern life become more difficult and time-consuming.

In 2002 the report of our independent inquiry, *Motoring towards 2050*[1], argued that, for as far ahead as we can see, the car will remain the main means of personal mobility and road transport the main carrier of goods. Noting that congestion was already severe, and that any significant initiatives for improvement would take a long time, it pressed for action to meet the challenges to start straight away. The situation is now more acute.

The Eddington Report of December 2006[2] emphasised the importance to the economy of good transport links – for growth, international trade, the efficient distribution of goods, and for making the best use of skilled labour. The Government's White Paper *Towards a Sustainable Transport System*[3] supports this judgement. Eddington also highlighted the very large economic returns to be gained from well-targeted investment. But an efficient transport system is important also for the citizens of this country to have access to the whole range of activities and services which make up modern living, such as jobs, education, leisure, medical services, and cultural and social events.

Road building is not popular with governments, central or local. So a number of initiatives and policies for transport and related land use planning are being pursued or considered with the objective of reducing the demand for roads, including

- improvement of public transport systems,
- cost-effective investment to enable the railways to overcome some of the capacity problems that inhibit their growth,
- making use of the opportunities offered by electronic technology to substitute for some travel,
- car sharing and travel plans, and
- encouragement of walking and cycling.

We considered the contribution that improving public transport could make to relieving congestion in *Motoring towards 2050*. We concluded that it would have some effect in reducing the expected growth in road traffic but that this would not be substantial. Our assessment of the potential contribution of the other measures noted is similarly relatively small. The scope is particularly limited for the main inter-urban routes with which this study is principally concerned. For these roads various

[1] RAC Foundation for Motoring (2002) Motoring towards 2050 (London: RAC Foundation)
[2] HM Treasury, Department for Transport (2006) The Eddington Transport Study: The Case for Action. (London: TSO)
[3] Department for Transport (2007) Towards a Sustainable Transport System Cm 7226 (London: TSO)

measures are being used or investigated aimed at managing traffic to make better use of the existing capacity. Although these are expected to make a contribution to easing congestion and should be pursued vigorously, on their own they will be insufficient to provide for present needs – let alone future traffic growth.

Against this background we have examined how the road network might be developed and managed cost effectively to deliver improved performance in support of economic and quality of life requirements. We conclude that, to achieve this objective, Britain needs a long term strategy for road transport based on a road building programme on a scale similar to that achieved in the early 1990s. The strategy should include national road pricing which would make the roads work more efficiently and, if properly regulated, would be a fairer way of charging for their use. Ministers have consistently said that we cannot build our way out of congestion. Of course not, and no-one would seriously advocate such a policy. But that does not mean increasing demand should be ignored, or that inactivity or repression is the right response to growing demand.

Environmental concerns

The adverse environmental impacts of road transport are important and must be taken seriously. They include emissions of pollutants and greenhouse gases, visual intrusion and noise. All these can and must be dealt with. Proper long-term planning, adequate and balanced investment, and targeted research and regulation can ensure that we meet our environmental objectives without sacrificing economic prosperity or our modern way of life.

Chapter 2 shows that improved vehicle and fuel technology has made huge progress in reducing or eliminating harmful emissions and that there are good prospects for taking this further. The recently published King Review[4] concludes that, possibly by 2050 in the developed world, decarbonisation of road transport could lead to reductions of around 90% in per kilometre emissions. On this basis, if road use approximately doubles by 2050, an 80% reduction in total road transport carbon dioxide could be achieved.

It is mistaken to argue that constraining road-building and massive investment in public transport will cut greenhouse gases. Congestion wastes fuel and so adds to the production of carbon dioxide. Chapter 5 looks at the effects on carbon dioxide production of road building and road pricing. It demonstrates that road building on the scale we envisage would increase carbon dioxide by no more than 5% assuming no other change: but in reality improvements in fuel and vehicle technology will achieve much greater reductions by then, and road pricing would more than counteract any effects of road building. Even if the use of public transport were doubled, it would make only a small difference either to the demand for car travel or to carbon emissions.

Though the building of the motorways and other main roads has made a profound contribution to the development of our modern economy, opposition to road building has grown over the past 20 years. This is to some extent attributable to insensitive planning of some of the earlier motorways, which has damaged important stretches of countryside and severed communities. Considerations of cost have too often prevailed over good planning. Any future programme must be planned much more sensitively. Routes must be chosen which avoid areas of environmental or historic importance, even if they are longer than a direct route; much more attention should be paid to the design of roads and structures; and more use should be made of tunnelling, for example, to reduce visual intrusion and noise. The benefits of the right road schemes are so great that they will still be good value for money despite the extra cost.

General objections to road building are often based on beliefs which are sincerely held and not to be dismissed out of hand, but they are sustained by over-simplifications and misconceptions. We examine some of these beliefs in Chapter 3 where, for example, we note that:

[4] HM Treasury (2007) The King Review of low-carbon cars. Part I: the potential for CO2 reduction (London: TSO)

- The suggestion frequently made that new road capacity 'simply fills up with traffic' fails to recognise the benefits supplied by the new capacity. New roads are built primarily to provide better, safer alternatives to inadequate or unsuitable existing roads (for example by-passes). They also provide the opportunity for greater access for more people.
- Road users are not subsidised. On the contrary, they currently pay more than enough tax to meet the full cost of road transport, including all environmental costs. Among all energy uses, only road users pay in tax more than the full price of carbon emissions.

The analysis

This study has examined the need for road building with and without road pricing. Our conclusions relate to the strategic road network – motorways and other major routes which link the regions and principle cities of Britain – even though our approach has required that we model the complete network. We have not examined in any detail the problems of suburban or urban areas, which deserve separate investigation.

We have explored the relationship between road building and road pricing to gain greater understanding of the costs, benefits and income, and the scale of new road building that would be necessary and justified.

The Eddington Study undertook a similar analysis to ours. Our work has been more detailed in looking at road transport needs, and it has used a longer timeframe – up to 2041 instead of 2025. We have applied mostly the same source data and the same type of road pricing – a national scheme based on the cost of travel to society, including the delay to other road users and environmental damage. We have called this 'efficient pricing'[5]. In the main, we have also used the same or similar assumptions, appraisal conventions and forecasts as Eddington.

The Eddington study, for which the analysis was carried out by officials from the Treasury and the Department for Transport (DfT), came to a similar conclusion that both road investment and road pricing are necessary, but with a different and lower assessment of the level of road building that would be economically justified. The reasons for the differences are discussed in more detail in Chapter 5 and in the Technical Report[6]. In summary they are that our study looked further ahead than Eddington, we used regional variations in values of time, and we separated out the benefits and costs to the economy and individuals from the benefits and costs to the Treasury by way of changes in taxes and charges. We consider that our method gives a clearer picture of the real implications for the economy and people: how the Treasury raises the money it needs in later years is a separate issue.

In summary, the choices for the inter-urban and strategic[7] road network are

- to do nothing and let **congestion** and wasted time match demand to the supply of road space,
- to build or widen **more roads** without pricing,
- to introduce some form of **road pricing** without additional road building and use the price mechanism to determine who should use the roads where there is insufficient capacity, or
- to employ a **combination of road building and road pricing** – the building to provide for the growing demand for travel and the pricing to ensure efficient use of road space.

[5] *Efficient pricing* - is based on the additional cost to society of every extra trip. A charge would be paid for vehicle use in relation to the costs imposed, comprising a standard rate for each type of road to cover the cost of providing the road and of additional accidents and adverse environmental effects, and a variable rate to reflect the increased delay to other road users, depending on place and time. It would, so far as possible, be objectively determined in relation to costs actually imposed in those circumstances.

[6] www.racfoundation.org/roadsandreality/technicalreport

[7] In this study 'strategic' roads are defined as the roads under the responsibility of the Highways Agency in 2003 (when the speed and flow data was collected), and the trunk network in Scotland and Wales. It comprises almost all the motorways and the trunk A roads. Since 2001 the Highways Agency has been implementing a programme of 'detrunking' strategic A roads- i.e. responsibility has been transferred to local highway authorities. When it is completed the English strategic road network will be reduced by a third. In 2003 the Agency was approximately midway through the programme.

The analysis shows that

- there is a strong economic case for more strategic road building in Great Britain at an annual rate of around 600 lane kilometres a year (Lkmpa), or more, whether or not road pricing is introduced. This is about the average level of road building achieved in the 1990s. The current level of construction is low by comparison,

and further that

- road building combined with efficient pricing would result in a higher economic return because mobility would be enhanced while congestion is reduced. It would also be fairer. The extra capacity would reduce the price needed to contain congestion, and travel by car would be affordable for more people on lower incomes.

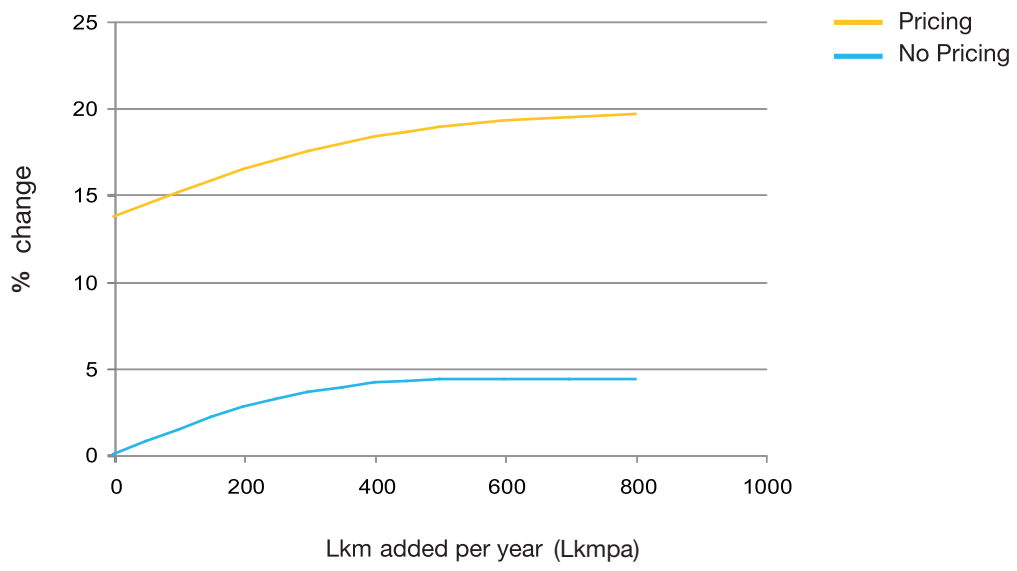
Key elements in the results of the analysis are as follows: (changes in speeds are used as an indicator of changes in congestion, speed reductions indicating worsening of congestion and increases improvement)

- In the absence of any interventions traffic would increase by about 37% between 2010 and 2041. There would be greater delays. The Eddington Report estimated that in the absence of action, the cost of congestion would rise by £25 billion between 2003 and 2025. It would, of course, go on growing thereafter.
- Adding a significant amount of strategic road capacity allows for an increase in traffic. However, without pricing or other measures, motorway speeds would still be 16% lower (ie delays caused by congestion would be greater) than in 2010.
- Efficient pricing on its own would cope with only 85% of forecast growth in traffic. Compared with the 2041 'do minimum' base case, speeds on motorways would be 12% higher (ie delays would be less) but its main effect would be in conurbations where traffic would be substantially reduced and speeds increased. Pricing in conurbations and other congested urban areas would need to be implemented with a complementary package of additional road capacity, public transport and

Figure 1 summarises the effects of additional capacity and pricing.

Figure 1

Effects of additional capacity and efficient pricing on average speeds on strategic roads in Great Britain in 2041 relative to "do minimum" base scenario



other measures. Without this the reduction of congestion would be limited, charges would be higher and mobility would be reduced for many.

It should be noted that the figures given above for increases or reductions in speeds are averages over the course of a day, including the times when traffic is very light. So, if average speeds reduce by a given percentage (ie average delays increase), the effect at peak periods would be much greater.

Costs, revenues and affordability

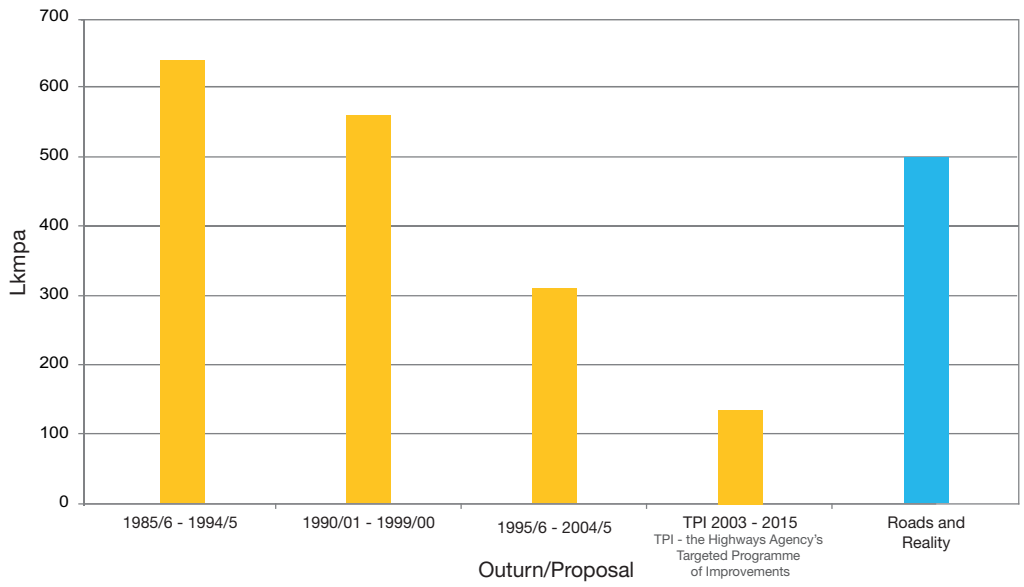
We have estimated the cost of providing an additional 600 Lkmpa of capacity to the strategic network as around £4.5bn a year, considerably more than current expenditure. Our recommended programme would provide good value for money with scheme benefit-cost ratios above 2:1. We recognise that there are pressures on public expenditure. But the programme we advocate is capital expenditure, producing a higher rate of economic return than most other forms of public spending.

We estimate that the annual financial yield from efficient pricing in association with a 600 Lkmpa programme would be £25-30bn. This would be payment from users additional to fuel duty and road tax at the present rate. We argue in Chapter 6 that public acceptability of pricing requires that some of this money must be seen to be directed to projects addressing relief of congestion. Our estimate of the cost of setting up and operating the pricing system itself is around £4.5bn a year. The pricing yield would be able to cover this together with the cost of 600 Lkmpa additional capacity and leave a substantial balance, £15-20bn. We argue, again on acceptability grounds, that all or most of this should be used to reduce the existing taxes on road users.

Thus efficient pricing, as well as increasing the benefits from the new capacity, would provide the means to finance it.

Figure 2

Actual and proposed rates of road construction – England



Towards a long term national roads strategy

Government policy has for some years been to reduce the size of the strategic network for which it is responsible by handing major routes over to local authorities. This leaves central Government responsible for only the motorways and very few other major roads. Its policy is to widen the most congested sections and make minor improvements. Motorway widening is highly necessary as a short-term measure, but it can create only a once-for-all increase in capacity which would be insufficient to meet continuously growing demand. The Government has also been exploring the feasibility of national road pricing, though no decision has yet been taken. Our study has shown that road pricing could not on its own cope with the increase in demand. Without a substantial programme of road construction, the Government would have to rely on using higher and higher road charges to choke off demand particularly from those least able to pay. This would seem to be an unattractive prospect from both the economic and social points of view.

A fundamentally new approach is required. To deliver a programme of road building on the scale we conclude is necessary and to realise the benefits in the process will require a fully scheduled plan with a long term horizon showing which links should be developed and how and when. To establish this will require comprehensive assessment of forecast patterns of demography and economic activity, and the new and more extensive patterns of travel that economic growth and social change create[8].

Figure 2 shows for the strategic road network in **England** how our conclusions compare with past rates of construction and the Highways Agency's current Targeted Programme of Improvements (TPI) which should be substantially completed by 2015. The Department for Transport has given no indication of what the programme after that will look like.

Following the approach of the Eddington report, the Government has now proposed a new approach to strategic transport planning on a multi-modal basis, based on Eddington's proposals. We welcome an approach which starts from what people need and want, rather than the wishes of the providers of transport. But we would counsel against following the pattern of the local multi-modal studies set in hand in the late 1990s. These took a long time, were very expensive in consultants' fees, and produced little by way of useful results. What is needed now is a brisker, more focussed piece of work, examining genuine alternatives but concentrating on the urgent problems.

So far as the strategic road requirements are concerned, only government has the resources to develop a detailed plan, but our indicative proposals for corridors where new strategic roads or other major capacity enhancements should be considered are

- substantial extra capacity to serve growing demand between London, the Midlands and the North,
- capacity to relieve congestion and serve population growth in eastern England, the South Midlands and the South West,
- East-West routes between conurbations in the Midlands and between those in Yorkshire and the North West,
- radial routes from London, and
- orbital capacity round the main conurbations.

Additional capacity can be provided by widening existing roads, both part of and outside the present strategic network. As widening proceeds, however, the scope for further improvement by this means will diminish and an increasing need to provide some completely new roads can be expected. Considerations of planning may also point towards completely new roads, to reflect, for example, changes in location of population and economic activity or establishment of new major transport facilities like airports. Provision of parallel alternative route capacity would not only relieve the major motorways, but would provide diversionary routes when accidents or other events cause disruption.

[8] The Government has recognised the importance of redressing underinvestment in public infrastructure: see Productivity in the UK para E9: http://www.hmtreasury.gov.media/E4/71bud06_productivity_513pdf

Where new roads are necessary, they should be planned with 21st century standards and technology, with the most modern safety features and more effective environmental mitigation including more use of tunnels and cuttings. Consideration should also be given to new roads confined to cars and light vehicles where these parallel and relieve existing routes. They would be cheaper to build and maintain, could be less intrusive and would be more pleasant and safer to drive on since cars would be separated from heavy lorries. Private finance would be an option, with or without tolls.

Implementation

Public policy, especially in the last fifteen years, has increasingly failed to address effectively long term road transport issues. The road network is of variable quality and is already under strain from sustained traffic growth. But there is currently no national plan for the whole road network. Nor are there long term congestion reduction targets, despite the widespread introduction of targets in other public service areas. There are no statutory obligations at national level to reduce congestion. Following the recent reorganisation of the Department for Transport, there is now no part of the Department , and no Minister below the Secretary of State, with responsibility for the network of roads as a whole. In recent years there has been a progressive weakening of the political support for road improvement, and an increase in the complexity and difficulty of obtaining approval and funding for road schemes. The latter difficulties should be eased by the proposals in the Planning White Paper, but only if there is available an authoritative, coherent and substantive long term plan for the strategic roads.

At the heart of these problems is a lack of leadership and of long term thinking to address growing demand and an ageing network, and a pretence that growing congestion is beneficial in working to help the environment by deterring traffic. Without some fundamental changes there will be no prospect of achieving either congestion reduction or a more efficient use of the highway network, or indeed providing essential support to a continuingly prosperous economy.

In its Planning White Paper[9] the Government is proposing to prepare National Policy Statements for major infrastructure, including transport. We support this provided they can be prepared quickly, and would argue that for transport such Statements should include a comprehensive long term strategy for the road network as discussed above. We also support the proposals for speeding up the planning process.

Road pricing

Our analysis shows that road pricing can increase the benefits yielded by an improved road network. It shows also that, without additional investment in new road capacity, many road users would lose from the change and the additional cost to the motorist on average would be considerably greater than the advantage. With an investment of 600 additional lane kilometres per year, there would be a substantial gain for the motorist as well as a new source of funds for investment in transport and mitigating its adverse effects.

We conclude that national road pricing in association with new capacity offers the means to

- make more efficient use of the network,
- ensure that road users pay no more nor less than the actual cost of road travel including external environmental costs,
- indicate through the level of charge where investment is needed, and
- provide sufficient funds from a reliable source for continuing investment in transport so as to improve accessibility and reliability and reduce congestion.

To introduce road pricing successfully would require a number of crucial concerns to be addressed. On recent experience substantial opposition must be expected and overcoming this will require

[9] HM Government (2007) Planning for a Sustainable Future (London: TSO)

reassurance that motorists and other road users are not merely expected to pay even more tax for little or no benefit, that the charges do not impact disproportionately on poorer people, and that civil liberties and data protection are safeguarded.

A crucial issue not covered by the Eddington Study is how the income from pricing should be spent. There is a need for clarity on this issue. We suggest that the following principles should be incorporated:

- the component of the charge levied to cover the **cost and damage imposed on the wider community** (e.g. carbon dioxide emissions or noise) should be for government to spend as appropriate, using at least part to mitigate these impacts,
- the element of the charge **for road management and maintenance and the cost of administering the scheme** should be retained for these purposes,
- the **congestion** element of the charge should be allocated for schemes to reduce congestion and improve accessibility, including public transport projects to the extent that they contribute to road congestion reduction, and
- the proceeds from congestion charging should be allocated broadly in proportion to where it is collected. Such a formula would target the parts of the network where congestion and the price of travel are highest, where additional capacity is most needed and where the people who would lose from introduction of efficient pricing will be most concentrated.

Organisation

We believe that the first, most urgent steps we recommend can be carried out without the delay that major change in organisation would cause. We recommend that:

- The Department for Transport should set up a transport planning capability which will enable it to make an assessment of the country's road needs for the next 30-50 years. It should not be restricted to the network of strategic roads which the Highways Agency manages at present: it should cover other major national and regional routes. This capability should in principle also cover planning for the national railway network. The Department already has an impressive analytical economic and statistical capability, to which needs to be added a planning and engineering component.
- The relationship between the Department and the Highways Agency needs to be clarified and adapted. The Nichols Report's[10] recommendations on this subject have been accepted by the Government. The Highways Agency should progressively take over responsibility for, or at least the power to influence and fund, the development of a wider network of major routes which would be relevant to dealing efficiently with congestion.

The most important ingredient is the recognition by Government of the urgency and scale of the tasks.

The introduction of national road pricing would require changes in organisation and would bring new opportunities. A new organisation would be needed to plan and operate road pricing. It would need to be responsible for the development and implementation of the technology, for the setting and application of charges, and all the customer-facing and back office functions of billing, consideration of appeals, enforcement and security of personal data. It would also be responsible for the allocation of the revenue collected, in accordance with approved policies. To secure the trust of the public, such an organisation would need to be at arm's length from government, and subject to transparent and independent regulation.

Establishing an independent agency to operate pricing would be a major exercise and should not be compromised by extending its role initially. But in due course consideration could be given to widening its responsibilities to incorporate the use of the pricing revenue for the benefit of road users, including

[10] The Nichols Group (2007) Report to the Secretary of State for Transport. Review of the Highways Agency's Major Roads Programme (London: The Nichols Group)

- managing and maintaining the strategic road network,
- collecting and distributing revenues from the scheme for use of the strategic road network, on behalf of government for its share, and for local highway authorities in respect of their share,
- strategic road planning, and
- preparing and implementing network enhancement projects in consultation with the regional planning bodies and other interests.

Such a body, which might be called the National Roads Corporation, would have an assured source of revenue and a statutory responsibility for using it to plan, improve and maintain the system of national roads, guided by the pricing signals from user charging, on which the prosperity of the country depends. It would report to Ministers and to Parliament.

This is one model. Others are of course possible. In particular, road pricing could be the responsibility of a separate authority, alongside the National Roads Corporation and the local transport authorities. Whatever the precise form of organisation, we would argue the importance of maintaining the link between charges and investment in the strategic road network.

Conclusions

Congestion on the road network is having major adverse effects on the economy and the quality of life in Britain. We have investigated the implications of current forecasts and policies and concluded that without a substantial increase in investment there will be severe deterioration in the situation. The Eddington Study estimated that congestion costs could grow by £25bn between 2003 and 2025[11] unless action is taken.

Our analysis shows that a rate of investment of around 600 lane kilometres a year, well above levels currently planned but in line with past rates, would yield substantial benefits in journey times and reliability and do so cost effectively. It shows further that introduction of national road pricing in addition would increase these benefits and provide revenue some of which could and should be used to finance the additional capacity. We would press that programmes for these changes should be commissioned as a matter of urgency.

To do this effectively we believe that the timeframe for planning must be extended and a long term strategy developed to establish where, how and when new road capacity and pricing should be delivered. We have indicated an outline of the form a strategy might take but only Government has the resources to develop a comprehensive plan. It should also address other key areas of concern such as environmental implications.

The lack of a long term strategy highlights the lack of leadership and muddled responsibility in addressing this major area of deficient performance. We argue that this should be put right by the development of a coherent long term roads strategy combining substantial new building with efficient pricing; together with changes in organisation to ensure delivery and safeguards so that road users get value for their money. All four elements must be included in a comprehensive approach to ensure effective implementation and allay the fears of those who oppose pricing. The alternative is growing congestion and deteriorating level of service – higher costs, more wasted time on more crowded roads, and damage to the economy and the quality of life.

[11] Defining the Challenge, table 3.8.