

Towards better transport

Funding new infrastructure
with future road pricing revenue

Richard Wellings and Briar Lipson
edited by Oliver Marc Hartwich

Towards better transport

Funding new infrastructure with future road pricing revenue

Richard Wellings and Briar Lipson
edited by Oliver Marc Hartwich



Policy Exchange is an independent think tank whose mission is to develop and promote new policy ideas which will foster a free society based on strong communities, personal freedom, limited government, national self-confidence and an enterprise culture. Registered charity no: 1096300.

Policy Exchange is committed to an evidence-based approach to policy development. We work in partnership with academics and other experts and commission major studies involving thorough empirical research of alternative policy outcomes. We believe that the policy experience of other countries offers important lessons for government in the UK. We also believe that government has much to learn from business and the voluntary sector.

Trustees

Charles Moore (Chairman of the Board), Theodore Agnew, Richard Briance, Camilla Cavendish, Richard Ehrman, Robin Edwards, George Robinson, Andrew Sells, Tim Steel, Alice Thomson, Rachel Whetstone.

About the authors

Dr Richard Wellings

Deputy Editorial Director, Institute of Economic Affairs

Dr Richard Wellings is the Deputy Editorial Director at the Institute of Economic Affairs. He is a deputy editor of the journal *Economic Affairs* and works on the production of the IEA's monograph series. After graduating from Oxford University, he undertook a PhD on transport policy at the London School of Economics, which he completed in 2004. Subsequently, he worked as a researcher for A & F Consulting Engineers, before joining the IEA in August 2006. He contributed two papers to *The Railways, the Market and the Government* (IEA, 2006) and is co-authoring a forthcoming book on road privatisation.

Briar Lipson

Research Fellow, Policy Exchange

Briar Lipson is a Research Fellow at Policy Exchange specialising in Economic Competitiveness. After graduating with an MA in Economics from the University of

Edinburgh, she worked as a Parliamentary Researcher for Grant Shapps MP.

Dr Oliver Marc Hartwich

Chief Economist, Policy Exchange

Dr Oliver Marc Hartwich is Policy Exchange's Chief Economist. He was born in 1975 and studied Business Administration and Economics at Bochum University (Germany). After graduating with a Master's Degree, he completed a PhD in Law at the universities of Bochum and Sydney (Australia) while working as a Researcher at the Institute of Commercial Law of Bonn University (Germany). Having published his award-winning thesis with Herbert Utz Verlag (Munich) in March 2004, he moved to London to support Lord Matthew Oakeshott of Seagrove Bay during the process of the Pensions Bill. He is the UK Representative for the German think tank the Institute for Free Enterprise. He is the co-author of *Unaffordable Housing: Fables and Myths, Bigger Better Faster More, Better Homes, Greener Cities* and *The Best Laid Plans*. He joined Policy Exchange in January 2005.

© Policy Exchange 2008

Published by

Policy Exchange, Clutha House, 10 Storey's Gate, London SW1P 3AY

www.policyexchange.org.uk

ISBN: 978-1-906097-12-7

Printed by Heron, Dawson and Sawyer

Designed by SoapBox, www.soapboxcommunications.co.uk

Contents

	Acknowledgements	4
	Executive summary	5
1	A competitive disadvantage: Britain's transport infrastructure	8
2	The case for road pricing	14
3	Harnessing private finance	20
4	The institutional framework	32
5	Taxation and investment	46
6	Additional policy options	57
7	Conclusions and recommendations	65

Acknowledgements

Policy Exchange would like to thank Serco, Bevan Brittan and an anonymous charitable donor for their financial support. The authors would like to thank all those who met with them to discuss aspects of the research, as well as Nick Boles, David Worskett and two anonymous referees for their advice and comments. In addition we would like to thank Philippa Ingram for proof-reading and Oliver Marc Hartwich for his insight, expertise and ongoing editorial support.

Executive summary

Transport has become one of the key restraints on Britain's economic growth and quality of life. Successive governments have failed to provide the standard of infrastructure necessary to keep up with an increasingly mobile and dynamic economy. Traffic congestion is now endemic, affecting not just large cities but also the core motorway network and small towns. It currently costs our economy in the region of £20bn per year, a figure set to rise significantly in the coming years. This will harm our future economic competitiveness and growth.

International comparisons suggest that the UK is close to the bottom of the table when it comes to transport infrastructure. Among the world's leading economies, the UK has the most crowded and congested roads, and the fewest motorways. Each year more than 1.6 million passenger kilometres are travelled on each kilometre of Britain's road network: more than twice the European average. The UK also performs poorly in terms of the quality of its public transport.

Clearly a step change is needed in the quality of Britain's infrastructure. Not only would this improve our global competitiveness – it would also improve the day to day lives of the travelling public.

The deficiencies of UK transport infrastructure do not reflect a shortage of tax revenues from transport. In 2006 private road users paid around £32bn in transport-related taxes. Of this £32bn, just £8bn was spent on the road network. And of this £8bn – which is enough in theory to construct at least 400 miles of six-lane motorway – a large proportion was spent on repairing damage to the roads (caused primarily by good vehicles) and another significant portion on anti-traffic and safety measures. New roads have also tended to be built for political reasons rather than to

“ As a method of allocating a scarce resource, to ration roads without employing road user charges is comparable only with the Soviet system of queuing: something so discredited as to be considered ridiculous in almost every sphere of life but motoring ”

tackle congestion. Inefficiency of government transport spending is a serious problem. Just 6 per cent of passenger travel is undertaken by train, compared with 84 per cent by car, yet the railways receive annual subsidies totalling almost £6.5 billion – nearly as much as the government spends on roads. The apparent misallocation of resources reflects the fact that transport infrastructure investment has become detached from consumer demand. The absence of price signals means it is difficult for government planners to allocate expenditure efficiently.

As a method of allocating a scarce resource, to ration roads without employing road user charges is comparable only with the Soviet system of queuing: something so discredited as to be considered ridiculous in almost every sphere of life but motoring. The waste and inefficiency of such a system is painfully obvious to anyone who has sat in congestion and traffic jams.

But the greatest barrier to pricing – public opinion – has arisen not because the public cannot appreciate the need for it. It is instead because, having endured decades of special taxation for the benefit of general spending, motorists do not trust governments to introduce pricing from which they will benefit.

One solution, as proposed in this report, is to upgrade transport infrastructure now, and then, once users have begun to experience substantial benefits, introduce the road user charges necessary to cover the

costs. There is, of course, the problem of how to finance the gap between the start of construction and collection of the revenue stream. The answer to this lies in private finance. The Private Finance Initiative (PFI) has a largely successful track record in the transport sector. The PFI was used in the Design, Build, Finance and Operate (DBFO) road contracts first employed in the early 1990s. Cost savings compared to public sector estimates were between 14 per cent and 22 per cent for the first eight such projects (depending on the discount rate used). The M6 Toll is another example of PFI in transport. Despite traffic projections failing to live up to expectations, ultimately it has provided a brand new road in a highly congested area at very minimal cost to the taxpayer. Similarly, PFI has enabled cities such as Nottingham to build and operate better public transport services.

One of the greatest problems for the private financing of transport infrastructure is political risk compounded by a lack of long term stability and accountability in transport governance. The Treasury, Department for Transport, Highways Agency, Network Rail, Regional Assemblies, Passenger Transport Executives and Authorities, not to mention the EU, all have some influence over policy in this area; and these are just the public sector bodies. With so many layers of governance and such diverse needs in different parts of the country we advocate a significantly more devolved approach to transport, possibly supported by a strategic road network manager, Network Road (by analogy with Network Rail). Simplifying the system and improving accountability would make transport investment considerably more attractive to potential investors, thereby lowering financing costs and raising the quality of affordable schemes.

Hand in hand with reforming and devolving the institutional structures must be consideration of both the fiscal framework around transport and the charges to be set. At least to begin with, the scheme we advocate will be revenue additional, but further investigation reveals two very striking facts. First, relatively small charges on congestion hot-spots will soon pay for improvements. For example, a six-hour peak time weekday charge of 10p/km on a six-lane motorway priced to run close to capacity could in a year raise around £1.5 million per km – sufficient to pay for widening to eight lanes or indeed, to construct a brand new six-lane motorway in parallel. Second, the dynamic effects of pricing and improved transport infrastructure on the economy will increase overall tax yields, which in time could facilitate cuts in fuel and vehicle taxes.

The issue of transport taxation has been complicated in recent years by environmental justifications for high fuel taxes. Although both are externalities of road transport, congestion and carbon emissions are separate problems with different solutions. Fuel consumption is a much more accurate proxy for carbon emissions than distance travelled, and should remain the preferred tool. That said, even according to the high-end estimates of the cost of carbon emissions detailed in the Stern report, the carbon tax on a litre of petrol should be around 11 pence, which is much less than the current petrol tax rate of around 50 pence per litre.

The British economy is suffering from its reliance on a centrally planned model of transport governance. It has left the country crying out for an injection of investment which is simply not available from the Treasury. In a relatively small country such as Britain with tightly centralised

planning laws and an affluent car-loving population, roads are – and will undoubtedly remain – a scarce resource for which rationing by queuing and congestion is inefficient. By combining investment with

pricing, and in that order, Britain's sub-standard transport infrastructure can be upgraded, thereby improving economic competitiveness and the quality of life of the British public.

1

A competitive disadvantage: Britain's transport infrastructure

Decades of insufficient and inefficient investment in transport have damaged Britain's international competitiveness. In their Economic Survey of the United Kingdom, the OECD stated that:

*"The United Kingdom ranks poorly in international comparison both on survey based measures regarding the quality of transport infrastructure and on measures of congestion."*¹

In March 2006 the Economist Intelligence Unit warned us that the UK risked slipping down the global business environment rankings if its "congested and unreliable land transport infrastructure" did not improve.² The Department for Transport has itself admitted that: "The core of our railway network was established well over a hundred years ago. Most of our motorways were built 30 or 40 years ago. Successive governments have devoted insufficient resources to upgrading and modernising the transport system, while travel on our road and rail networks has increased to levels that were never anticipated when they were built."³

The following figures from a 2001 report by the Prime Minister's Strategy Unit illustrate this analysis:

- In no other major country were the road lengths per person as short as in the UK, where there were on average

six metres of roads per inhabitant. Even in the Netherlands, which is much more densely populated, the figure was seven metres.⁴

- We have fewer kilometres of motorway than other European countries of comparable population. Spain, France and Germany each have a motorway network that is more than twice the size of ours.⁵
- Only 30 per cent of railway tracks were electrified in the UK, compared with more than 70 per cent in Belgium, Sweden and the Netherlands.⁶

As Figure 1.1 shows, Britain has fallen a long way behind its economic competitors in the provision of a modern transport network, even though it imposes the highest fuel taxes on road users.⁷ Already by 2004 China had constructed a motorway network ten times the size of the UK's and was investing around thirty times the UK figure (adjusted for purchasing power parity) in its road network. The disparity cannot be explained by lack of space. Motorways carry 20% of total traffic and 40% of road freight, yet they take up less than one two-thousandth of Great Britain's land area.⁸

Sir Rod Eddington, who reviewed the long-term links between transport and the UK's productivity, growth and stability for the Government in 2005-06,

1. OECD, *Economic Survey of the United Kingdom 2005: Public Services and Infrastructure: Tracking the Improvements*, www.oecd.org/document/27/0,2340,en_2649_201185_35461339_1_1_1_1, 00.html

2. *The Independent*, 28th March 2006, available at: www.findarticles.com/p/articles/mi_qn4158/is_20060328/ai_n16180583

3. Department for Transport, *The Future of Transport*, Stationery Office, 2004

4. The Strategy Unit, *Transport Strategy Review: Phase One*, Cabinet Office, 2001

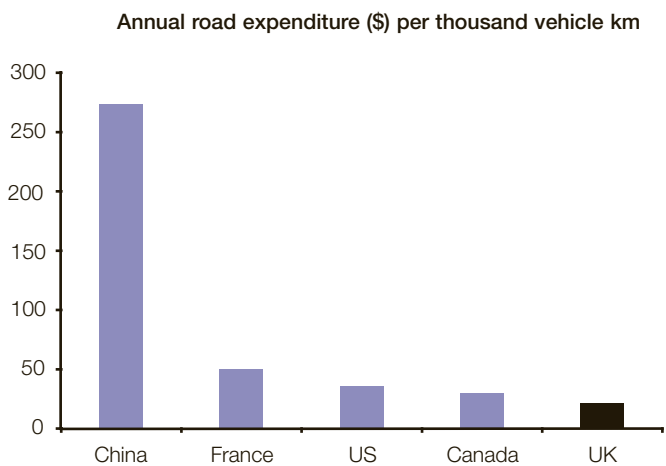
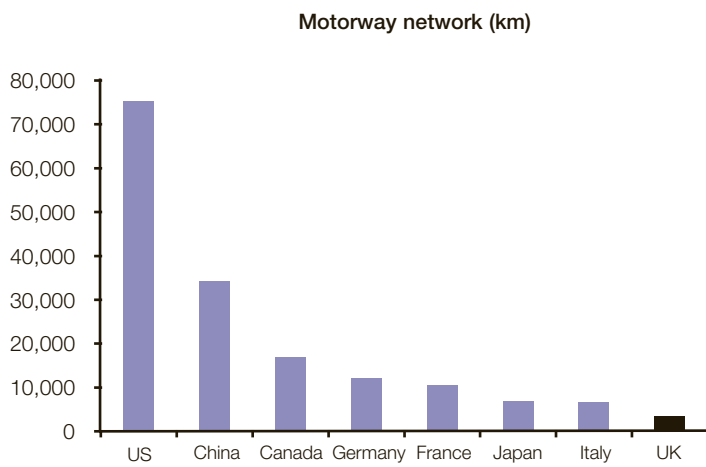
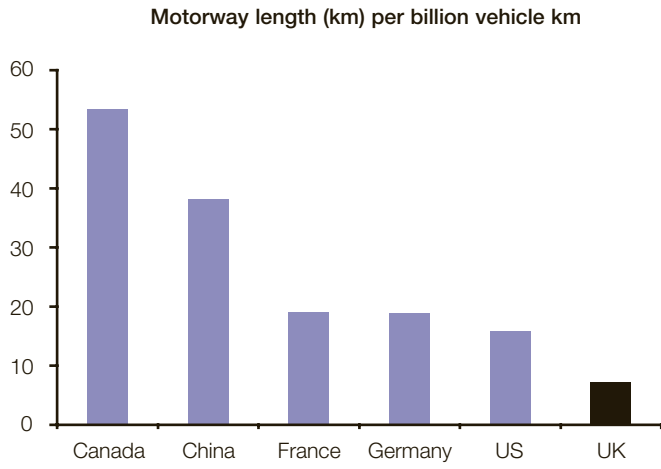
5. A large discrepancy remains even after adjustments are made for land area and population density. In fact, densely populated countries such as the UK would be expected to have more motorway km per head of population than less densely populated nations, since there would be greater demand for high capacity routes (traffic also declines as distances increase).

6. Ibid.

7. *World Road Statistics 2006*, Tables 8.1 and 8.2, International Road Federation, 2006

8. Calculated from Department for Transport, *Transport Statistics Great Britain*, Ch. 7, 2006

Figure 1.1 Selected road statistics for the world's major economies⁹



9. Sources: *World Road Statistics 2006*: Data 1999-2004, International Road Federation, 2006; and *Connecting East Asia, A New Framework for Infrastructure*, World Bank, 2005. Traffic volume excludes motorcycles and mopeds. Figures are the latest available, 2004 or earlier (purchasing power parity adjusted).

found that air transport performed relatively well (although planning delays now threatened this competitive advantage), but that land transport was a particular weakness. His study concluded that: “Continued economic success is forecast to lead to rising demands – if left unchecked 13 per cent of traffic will be subject to stop-start travel conditions by 2025.”¹⁰

British governments have always had a peculiar reluctance to invest in roads. In the 1920s and 1930s, when the first motorway networks were being constructed in Germany, Italy and the US, the Ministry of Transport actually prevented entrepreneurs from building motorways in England.¹¹ The UK would have to wait another 30 years, until the 1950s, for its first motorway. If such an anti-road building tradition is upheld in the 21st century, perhaps rationalised on environmental grounds, the country will be unable to fulfil its economic potential.

Very little extra capacity has been added since 1995, despite rising inter-urban congestion. Existing motorways often take indirect routes that add to journey times; the M1 heads north west towards Birmingham before heading north to Leeds. There are still obvious gaps in the network; Manchester and Sheffield, two of the country’s largest cities and only 30 miles apart, have no direct motorway connection – travellers must choose between the tortuous and dangerous Woodhead and Snake Passes or divert 25 miles north to the M62. Motorway provision is also patchy along the route of the Great North Road between London and Edinburgh. There is no link between Newcastle and Edinburgh or Newcastle and Glasgow, and the current A1 link follows an indirect and time-consuming route. The large conurbations of the North East of England (Teesside and Tyneside) have yet to be linked to the main motorway net-

work, although some progress has been made in recent years in upgrading the A1 in North Yorkshire. No direct motorway link exists between Southampton, one of Britain’s biggest ports, and the Channel Tunnel.

The misallocation of investment

The pattern of new roads has borne little relation to congestion levels or consumer demand, with the possible exception of the privately built and operated M6 Toll (Birmingham Northern Relief Road). The A74 through southern Scotland did not suffer from chronic congestion, yet this road was chosen for upgrading to motorway standard, probably for political reasons as it links Scotland (almost) to the English network. Similarly, the upgrade of the A1 in North Yorkshire was driven, at least in part, by regional development objectives.

Expenditure on public transport has also been driven by political expediency rather than economic efficiency. The level of government subsidy has risen significantly over the past 15 years to about £10 billion a year.¹² Of this, approximately £6.5 billion per annum is destined for Britain’s railways; even though they account for only 9 per cent of freight mileage and 6 per cent of passenger mileage (see Table 1.1).¹³ Furthermore operating subsidies are disproportionately concentrated on poorly used regional railways rather than the overcrowded London commuter routes.¹⁴

Money has also been lavished on large infrastructure projects such as the Channel Tunnel Rail Link and the modernisation of the West Coast Main Line (£5 billion and £7.6 billion respectively in 2004 prices). Neither scheme is likely to achieve a commercial return on investment.¹⁵ Local transport schemes have possibly been even worse investments. Of the numerous light rail schemes con-

10. *The Eddington Transport Study, the Case for Action: Sir Rod Eddington’s Advice to Government*, The Stationery Office, 2006

11. Plowden W, *The Motor Car and Politics*, The Bodley Head, 1971

12. Department for Transport, 2006, *op. cit.*

13. *Ibid.*

14. Wellings R, ‘Rail in a Market Economy’ in *The Railways, the Market and the Government*, IEA, 2006, p 225

15. See www.ctrl.co.uk and *Modern Railways*, June 2004, pp 52-4

Table 1.1: Travel and public expenditure by surface transport mode

Mode	Proportion of surface passenger miles (%)	Estimated annual government expenditure (£ bn) ¹⁶
Car/van	84	8
Rail	6	6.5
Bus	5	2.0
Underground	1	1.0

structed over the past 20 years none has managed a commercial rate of return.¹⁷ In fact many have been plagued by operating losses for much of their history.

The failure of supply and demand Lack of investment in transport infrastructure, especially roads, has definitely not been due to a lack of tax revenue from transport. The Government receives about £14 billion more from transport users than it spends on transport annually.¹⁸ Department for Transport figures show that UK taxes on petrol and diesel have always been among the highest in the European Union.¹⁹ A recent report from the Institute for Fiscal Studies found that Britain has the highest combined tax rate on unleaded fuel of any EU member state.²⁰ But tax revenue from transport is decoupled from spending on transport infrastructure.

Since rail and bus transport are heavily subsidised, the burden is far higher for private road users, who pay £32 billion in special taxes compared with government expenditure on the roads of about £8 billion per annum.²¹ The latter is still a significant sum, enough to construct at least 400 miles of six-lane motorway. However, much of it is spent on maintenance (damage to the roads is primarily caused by goods vehicles) and a significant proportion on anti-traffic and road safety measures. In general, the economic efficiency

of government expenditure on transport and roads is questionable. And there are sound theoretical reasons to expect a high degree of government failure in this regard.

“ The Government receives about £14 billion more from transport users than it spends on transport annually ”

Gabriel Roth believes that governments provide roads using methods similar to the command economies of Eastern Europe – and with similar results: “Congestion in some parts of the system, wasted capacity in others, and widespread deterioration and financial losses.”²² Indeed, the transport sector as a whole is subject to a high level of state intervention in the UK. There is direct political control of fuel duty rates and road tax, while numerous centrally decided regulations determine matters such as speed limits, safety standards and vehicle sizes. The Government chooses which transport modes to subsidise, which to neglect and which to tax heavily; it is not surprising that a large proportion of consumers are dissatisfied with the provision of transport services or that transport prices bear very little relation to demand.

Market prices play some part in the transport sector, as one would expect in a

16. Precise figures are unavailable. For example, not all road expenditure provides infrastructure and services for motorists. Wear and tear is predominantly caused by goods vehicles.

17. Babalik E, *Urban Rail Systems: A Planning Framework to Increase Their Success*, unpublished PhD thesis, University of London, 2000 www.env.leeds.ac.uk/its/private/level2/instruments/instrument002/l2_002a.htm#cost

18. Calculated from Department for Transport, *Transport Statistics Great Britain*, 2006

19. *Ibid.*, Chapter 10

20. Leicester A, *Fuel Taxation*, Institute for Fiscal Studies, 2005, www.ifs.org.uk/bns/bn55.pdf

21. Department for Transport, 2006, *op cit.*

22. Roth G, *Roads in a Market Economy*, Avebury Technical, 1996, p 1

mixed economy, but their role is subordinated to that of political control, primarily from central government departments. For example, the provision of new infrastructure is largely centrally planned. If there is a congested road then it is very unlikely that capacity will be increased as a response (raising tolls is impossible under the present regime). New roads are perhaps more likely to be built in relatively uncongested areas as part of regeneration schemes.

“ On every kilometre of Britain’s road network more than 1.6 million passenger kilometres are travelled every year – more than twice the European average ”

Central planning authorities are less capable of making efficient resource allocation decisions than free markets operating within relatively unrestrictive regulatory framework. Because government decision-makers do not personally own the capital they are allocating they have weaker incentives to act responsibly or show initiative.²³ They are further hampered because they may not have access to relevant market prices and therefore cannot accurately calculate costs and outputs.²⁴ Transport officials have faced this problem when planning new road schemes. In the absence of toll revenue from road users, the true value of the facility to users cannot be known and therefore the rate of return on the capital spent cannot be calculated. Vital information about the best way of allocating capital resources is lost.

Although it is impossible to quantify precisely the impact of the current misallocation of transport sector resources on the British economy, the negative effects could be of far greater magnitude than those simply relating to congestion. Commentators

have often neglected transport’s integral role in productivity increases and the resulting production of wealth. Travel times are not only dependent on the absence of congestion but also the pattern of infrastructure provision.

One should remember, too, that subsidies for public transport are financed from taxation, with the associated harmful effects on the production of wealth, including reduced incentives and distorted decision making. Then there are the costs of tax collection (and the effort expended in avoiding taxes) to consider. Some economists have estimated that “deadweight losses” mean every additional pound collected by taxation costs the economy a further 50p to £1.50.²⁵ Thus public transport subsidies inflict substantial economic damage for the sake of a relatively small proportion of the market for mobility.

Transport and wealth creation

As our economy has expanded the need to travel has increased, but investment in transport infrastructure has not kept pace and existing transport networks have become increasingly congested. In no other major European country are roads as congested as in the UK. On every kilometre of Britain’s road network more than 1.6 million passenger kilometres are travelled every year – more than twice the European average.²⁶ It has been estimated that traffic congestion costs the UK economy as much as £21 billion per year.²⁷

Eddington estimated that by 2025, without action, congestion on England’s roads will rise by 30 per cent, increasing costs to businesses and freight by over £10 billion a year, and wasting an extra £12 billion worth of time for households.²⁸

As for the opportunity costs (negative economic impacts of the exchanges *not* undertaken because perceived congestion acts as a deterrent) associated with congested

23. Mises L, ‘Economic calculation in the socialist commonwealth’, in F. A. Hayek (ed.), *Collectivist Economic Planning: Critical Studies of the Possibilities of Socialism*, Routledge and Kegan Paul, 1935, pp 87-130

24. See Mises L, *Human Action: A Treatise on Economics*, William Hodge, 1949, p 696

25. See, for example, Harrison F, *Wheels of Fortune*, London: IEA, 2006, p 165

26. Calculated using data from *Panorama of Transport*, Eurostat, 2007

27. Blythe P, ‘Congestion Charging: technical options for the delivery of future UK policy’, *Transportation Research Part A*, 38; pp 571-87, 2006

28. Eddington R, *op. cit.*, p 30

tion, they are difficult to estimate. Examples include businesses not competing for trade in congested areas, potential employees not applying for jobs because the travel-to-work time would be too great and directors not holding a meeting because it would waste too much time to travel the distance to convene.

The economic benefits of efficiently distributed transport capacity could be substantial. If travel costs allow, more companies can locate in one area, increasing competition, enabling economies of scale and thus increasing productivity. For example, new motorways could dramatically increase the population within, say, two hours' drive of a particular location. The new infrastructure could make the construction of a large and efficient distribution centre viable where previously only a small centre would have been profitable. Reduced transport costs bring similar gains in the retail and manufac-

turing sectors. Trade is facilitated that otherwise would be uneconomic, resulting in more specialised and productive economic activity. Of course, for the full economic benefits of improvements in transport infrastructure to be realised it is essential that businesses and individuals are free to locate their activities at the most efficient sites. Thus the biggest economic gains are likely to be achieved when efficient transport networks are combined with a high degree of freedom in land markets.²⁹

The widening gap between supply and demand for transport in our fast-moving economy is threatening our very economic competitiveness. Rather than risk slipping down the international league tables of the best places to live and do business in the world, Britain must bring about a step improvement in transport. This report explores a long-term and politically viable solution.

29. On the economic impact of planning controls, see Evans A and Hartwich O, *The Best Laid Plans: How Planning Prevents Economic Growth*, Policy Exchange, 2007

2

The case for road pricing

The true costs of motoring

At present a significant proportion of road user costs such as depreciation, insurance and vehicle excise duty (VED), are fixed. Once paid, they may actually encourage motorists – equating marginal journey costs to the price of fuel – to use their cars more than they otherwise would in order to justify the sunk payments. Road pricing could help reduce this ‘information’ problem by, in relative terms, reducing the fixed element and increasing the marginal element of road travel costs – for example, by abolishing vehicle excise duty and introducing pay-as-you-go insurance and tolls for using congested roads.

Fuel tax, and to a lesser extent VED, are the only pricing mechanisms currently available to the government to ration road use. Although they undoubtedly do this, they do not accurately reflect the external costs of using particular roads. These external costs vary widely by location, time of day, type of vehicle and grade of road. Evaluated rationally, they could be incorporated into road user charges. The details of such a scheme are outlined below.

Congestion costs

At certain times and locations road space is clearly a scarce resource. The evidence is congestion. But such variations in the scarcity of road space are not reflected in current motoring taxes: users pay roughly the same no matter what kinds of road they use, where or at what times.

To put it in blunt economic terms, drivers at busy times do not pay the full marginal costs they impose on other road users through resulting congestion. Of course, motorists using congested roads pay a price in the sense that their time is wasted. However those for whom time has a lower value (for example the retired or unemployed) are able to impose higher costs on those for whom time has a greater value (hospital consultants or couriers delivering expensive just-in-time products for example). Any system that fails to account for the fact that different people value time differently is intrinsically inefficient. As a method of allocating a scarce resource, to ration roads without employing road charges is comparable only with the Soviet system of queuing: something so discredited as to be considered ridiculous in almost every sphere of life but motoring.

Road pricing would force motorists to take the value of their time into account. People with a high degree of flexibility about when they travelled could choose to go at off-peak times when tolls were low. Road operators could even offer special rates, like saver fares on the railways, to encourage travel at the quietest periods. Such variations in price would even out traffic levels over time and space, potentially increasing the use of existing road capacity.

Track costs

It clearly makes sense for drivers using extremely expensive urban motorways – perhaps built on expensive land and

involving the purchase of hundreds of properties and tunnelling – to pay more than a driver using a neglected rural A-road that has barely been improved since the 1920s.

However, although this principle can easily be applied to newly built infrastructure, it is more difficult when it comes to existing roads. Drivers may feel, with some justification, that they have already paid the construction costs through their motoring taxes. But it is important that the current capital value of roads is reflected in pricing regimes to ensure an efficient allocation of resources. These issues and possible institutional solutions are discussed further in Chapters 4 and 5.

Environmental costs

The environmental costs of road use – such as noise and pollution – also vary greatly over the road network and, once again, the current taxation regime does not reflect this. The introduction of road pricing offers the possibility of more closely relating vehicle charging to differences in environmental impact. For example, noise and local air pollution costs might be negligible in many sparsely populated rural areas but considerable in densely populated urban areas. Any attempt to include environmental charging within a road pricing scheme would undoubtedly be complicated by disagreements over valuation methodologies.³⁰

Another subject for debate would be whether revenues from environmental charges should be appropriated by government for general expenditure, as with current fuel duty revenues or whether they should be used directly to reduce environmental costs (or perhaps compensate affected individuals). If these problems can be overcome then pricing could create incentives for road users to reduce the environmental impact of their journeys by, for example, using quieter and less-polluting vehicles or driving less in urban residential areas.

Accident costs

Similar benefits could be forthcoming in road safety. More than 3,000 people are killed on Britain's roads every year, with a huge human and economic impact.³¹ It could be possible to pay accident-insurance based on usage, as Norwich Union now offers, or even as a component of tolls. With either system, insurance companies could charge road users more to travel along roads with a high casualty rate or after midnight, and less to travel along safer roads or at off-peak times during the day. This would give drivers an obvious financial incentive to use safer roads and could, if some form of partial pricing is introduced, help deter the diversion of motorists from motorways on to minor roads.

“ Variations in the scarcity of road space are not reflected in current motoring taxes: users pay roughly the same no matter what kinds of road they use, where or at what times ”

At the same time, infrastructure operators would have an incentive to ensure that their roads were safe in order to attract customers – particularly if the institutional framework encouraged a degree of competition between infrastructure providers/ operators. Thus pricing offers the potential to introduce strong financial incentives towards reductions in the accident rate.

It is also possible that a pricing system could reduce the number of untaxed and uninsured drivers using the road network. Research suggests that such individuals are more likely to be involved in accidents than other motorists.³² Thus, depending on the nature of the scheme(s) implemented, there could be an additional road safety effect beyond the incentive structures detailed above.

30. See Wellings R, *op. cit.*

31. Department for Transport, 2006, *op. cit.*

32. RAC Foundation, News Release, available at: www.racfoundation.org/index.php?option=com_content&task=view&id=318&Itemid=35, 7th November 2005

Clearer choice

Road pricing would make it straightforward to compare the total cost of travelling by car or public transport. Distortions from discriminatory taxes and subsidies would be removed or at least minimised, externalities would be costed and accounted for and, with congestion reduced, motorists would be able to estimate their journey times with far more accuracy than at present. Britain's transport infrastructure would be used more efficiently by all users.

“ If roads were priced to avoid congestion, the highest tolls would be raised at the biggest bottlenecks, providing a powerful incentive for infrastructure operators to construct additional capacity ”

Better investment

Road pricing is not just about enabling individuals to make rational transport decisions, the revenues produced would also provide valuable information about consumer demand for travel and point to those locations where new infrastructure may be most profitably provided. By exploiting the scattered preferences of 30 million drivers, road prices would provide far more accurate and dynamic information about transport preferences than that currently available to planners.

If roads were priced to avoid congestion, the highest tolls would be raised at the biggest bottlenecks, providing a powerful incentive for infrastructure operators to construct additional capacity. This capacity could be for public transport rather than private road vehicles if it would harvest more revenue and the institutional framework were sufficiently flexible to allow such cross-modal investment. As Alan Day argues, road pricing should not simply be used to ration existing road

space, but also as “a measure of whether or not to add to (or, indeed, subtract from) the existing road space: it can and should be used as an investment criterion.”³³ In the absence of pricing and given the distortions of the taxation system, it is difficult to value our road infrastructure accurately. Potential investors struggle to calculate future demand and revenue risk is high.

Facilitating competition

The revenue risk problem is well illustrated by the development of the M6 Toll (known in the planning and construction phase as the Birmingham Northern Relief Road). Such uncertainties meant that the cost of the scheme was inflated by high financing costs, while traffic projections – and revenue forecasts – were overly optimistic.

In the absence of wider pricing the M6 Toll suffered from ‘unfair’ competition from the existing M6. In particular, except during severe congestion, speed-limited hauliers had little to gain by using the toll route. At the same time, M6 Toll users effectively paid twice when fuel duty and vehicle excise tax are included. If a national road pricing system had been in place motorists on the original M6 would also have had to pay a toll and, potentially, motoring taxes might have been reduced or abolished. The ‘unfair’ competition currently observed would have been eliminated.

The implications of this are potentially groundbreaking. It would enable private investors to build new links to compete with existing ones in terms of price and quality of service – and bring about a step change in the quality of Britain's infrastructure. However, the level playing field necessary to obtain the greatest economic benefit from private investment would require an appropriate institutional and fiscal framework. As we examine next, the politics of transport could make this difficult to achieve.

33. Day A, ‘The Case for Road Pricing’, *Economic Affairs*, 18 (4), pp 5-8, 1998

What is the case against road pricing?

Road pricing could be a remarkable tool to improve the efficiency of our transport network, but honest analysis must concede that it will have some inherent difficulties to overcome.

Public opposition

About 1.8 million people signed a petition against road pricing on the Downing Street website and surveys show that between half and three-quarters of the public are opposed to pricing, depending on the details of the scheme.³⁴

The same surveys demonstrate that opposition is reduced when it is made clear that road pricing revenues will be used to reduce motoring taxes or improve transport infrastructure.³⁵ Indeed, a majority of the public might support a scheme providing certain conditions are met. However, there is widespread and understandable distrust of government motives and a fear that road pricing could end up being another tax-raising exercise, just as the road fund was appropriated by the Treasury and fuel duty is used for general expenditure rather than improvements to transport infrastructure.³⁶ The way in which the proceeds from road pricing will be used would have to be attractive and clear in order to build up public support.

What rates should be charged?

If the primary goal is to reduce congestion and speed up traffic, then prices should reflect the scarcity value of sections of road at various times. Prices would need to be set by trial and error until congestion disappeared and traffic flowed freely.³⁷ But given the likely opposition to the introduction of pricing mechanisms, political expediency and not scarcity value may determine the charge set. Economic benefits would then be lost since prices could be too expensive at certain times (leading to

wasted road space and lost economic activity) and too cheap at others (causing congestion).

Although road pricing schemes must be sophisticated enough to ensure the efficient use of road space, they must also be predictable and easy for users to understand, so that motorists are not surprised by a sudden rise in rates leading them to seek alternative routes. Unfortunately, it is hard to achieve both features simultaneously, so a careful balance has to be struck between fine-tuning the system and not confusing drivers. This also means dealing with “boundary” effects that occur, for example, when traffic increases just after the peak rate charges finish. These are difficult technical questions, but they can be answered. Over time and with the opportunity to experiment with different charging schemes, what works and what does not will become clear.

Competing transport systems

Road pricing would not operate in a vacuum because there are other modes of transport with which roads have to compete. As Eddington recommended, the Government needs to get prices right for all forms of transport, especially congestion pricing on roads and environmental pricing across all modes.³⁸ For travellers to make efficient decisions, therefore, price distortions between different modes must be removed as far as possible. If congestion pricing is applied to the road system then it must also be applied to public transport, including the busy commuter trains running into central London. This has, of course, already begun with peak and off-peak pricing on the rail and London Underground network. Levels of overcrowding on these trains suggest that peak fares should be increased further, although some passengers may wish to trade discomfort for affordability. But on the rail network, season tickets and fares for all journeys within 50 miles of London are regulated so fran-

34. See *Road User Charging*, RAC Foundation 2006, www.racfoundation.org/index.php?option=com_content&task=view&id=350&Itemid=35

35. *Ibid.*

36. Plowden W, *op cit.*

37. See Hibbs J, ‘A Radical Approach’, *Economic Affairs*, 18 (4), pp 2-4, 1998

38. Eddington R, *op. cit.*, p 50

chisees are not at liberty to raise fares in order to reduce demand on peak-time commuter trains. The resulting congestion has led to demands for expensive capacity increases on the worst affected routes. If the logic of road pricing were applied to public transport it would be difficult to justify the continued regulation of such fares.

The same reasoning should apply to environmental charges. If an environmental charge is included within road prices, public transport users should also pay such a levy. Under-pricing the environmental impact of public transport will encourage inefficient use.

Taxation and subsidies

While road users pay taxes such as vehicle excise duty and fuel tax, buses and trains receive substantial government subsidies and a VAT exemption on their fuel. This imbalance should ideally be corrected.

From an environmental perspective and in certain locations the continued government subsidy of carbon emissions through special support for public transport is difficult to justify. The introduction of road pricing – alongside an economy wide carbon tax (see Chapter 5) – would demonstrate whether existing public transport services are commercially and environmentally viable. This is a further argument in favour of increasing the pricing flexibility of public transport operators and reducing subsidy levels.

The introduction of a (non-carbon) environmental component to road pricing – it would probably vary according to the estimated (non-carbon) environmental impact of a journey – would, alongside an economy wide carbon tax, provide a powerful rationale for phasing out existing motoring taxes. This would also increase the political acceptability of road pricing and have economic benefits, since distortions are likely to occur when taxes are focused on one sector of the economy

alone. These issues are discussed further in Chapter 5.

Operating costs

Opponents of road pricing argue that most of the revenue generated would be spent on administration. High estimates of the costs of introducing and administering a national scheme have been published recently.³⁹ If, for example, the system cost £10 billion a year to run (about £300 per vehicle), this amount would constitute around half the annual current cost to the UK economy of congestion and, to put the figure in further perspective, would be sufficient to construct at least 500 miles of six-lane motorway. A complex IT driven road-pricing scheme could suffer from severe cost over-runs and delays in implementation, as seen with the German lorry charging system, and the £6 billion National Health Service “choose and book” computer system, which may end up costing £50 billion.⁴⁰

Opinion differs on whether such a scenario is probable for road pricing; it has been suggested that the costs of implementation are likely to be concentrated in the technology installed in vehicles rather than complex computer systems.⁴¹ Without question, though, any proposal will inevitably have to balance the potential benefits with the costs and risks associated with administration.

Wider economic effects

Thus the economic benefits of road pricing could be lost through a combination of political interference, modal bias, failure to reform taxation and inflated administrative costs. It would be foolish to deny that these dangers exist or to ignore them when introducing a road pricing scheme.

If expensive peak-time pricing were introduced in major cities to eliminate congestion, strict government planning controls could prevent businesses and households from moving out of cities to avoid the high charges (a market reaction

39. For example ‘Drivers face £600 bill for an in-car road pricing black box’, *Daily Telegraph*, 21 February 2007. www.telegraph.co.uk/news/main.jhtml?xml=/news/2007/02/19/nroa.ds19.xml

40. See *Sunday Times*, 2 April 2006 www.timesonline.co.uk/tol/ comment/columnists/simon_jenkins/article701108.ece

41. Private communication, 19 April 2007

that makes more efficient use of the available road space and cheaper land). Companies could face demands for increased pay from workers charged to drive into town at peak times.

At the same time, modal bias is likely to mean that public transport users would not be paying the full costs of commuting into city centres, since services are subsidised and environmental costs ignored. Thus significant numbers of commuters would be displaced on to public transport, which is often already full at peak times. The Government might then think it expedient to spend significant capital sums on increasing capacity on public transport. However, because market prices are so distorted by the simultaneous use of fuel tax, VED, road user charges and public transport subsidies, and because governments are notoriously poor at investment, this may well represent a misallocation of resources. A significant proportion of the economic gain from road pricing could be dissipated on wasteful public transport schemes. Although in some areas public transport schemes will be commercially viable, in others journeys cannot easily be transferred to public transport and so businesses and individuals could face substantial economic losses, both from direct charging costs and opportunity costs.

This is only one example, but it could have wider implications. Public transport receives around £10 billion in subsidies every year.⁴² If the number of commuters using public transport doubled as a result of road pricing, the need for increased subsidy would be very significant indeed.

The redistributive effects of road pricing are also far from clear. A negative effect on some less affluent inner city areas is possible. Pricing could deter middle-income motorists from living in such locations, leaving inner cities to low-income public transport users and increasing social polarisation. Demands for regeneration subsi-

dies could then rise, dissipating yet more of the benefits of road pricing.

Finally, there is the possibility that, driven by bureaucratic and industry interests, the road pricing system would suffer from high set up and administration costs, further undermining its economic case.

A new case for road pricing

All of this leaves transport policy on the horns of a political dilemma. To realise the advantages of a market-based solution, road pricing has to be introduced. Yet on its own such a proposal would be guaranteed to meet with fierce political resistance, which in turn could lead to excessive intervention and over-regulation – as happened with rail privatisation. Given budget constraints and the high level of fuel taxation, it would be difficult to finance new infrastructure through either the general budget or by levying higher petrol and diesel duties. One way to surmount these difficulties would be to combine the introduction of road pricing with the provision of new infrastructure. Motorists would not then be paying again for existing infrastructure, but for vital upgrades to the network.

But unfortunately this would involve a time lag, because new infrastructure can take years to plan and build. The M6 Toll, for example, was first considered in the early 1980s but opened only in 2003. Paying the tolls would only be followed by better infrastructure at a much later date. If transport users were charged throughout this time without any visible improvement in the infrastructure, road pricing could well fail. That is why this report suggests taking a different route: introducing road pricing after the necessary upgrades to our transport infrastructure have been made. The obvious question, which the next chapter explores, is how to finance the investment in new infrastructure before the revenue stream from user charging has even begun.

42. Department for Transport, 2006, op cit.

3

Harnessing private finance

Historical context

In the 18th century a mixture of public and private capital funded the development of an extensive and integrated network of toll roads or turnpikes.⁴³ In the 19th century, following the commercial development of the canals, private companies built a vast railway network, supported by Acts of Parliament that enabled the compulsory purchase of land. During the 1920s private consortiums proposed a series of profit-making toll motorways linking London with other big cities, usually with the support of the local authorities along the route. By this time, however, the political climate had changed and Sir Henry Maybury, the Minister of Transport, objected to “the placing of very important road traffic arteries in the hands of private capitalist enterprise, to be operated for profit”.⁴⁴ Britain never did get a privately built motorway network but, in the right conditions, private investors were prepared to fund the development of large-scale infrastructure networks.

As the role of the State grew, in transport as in other economic sectors, opportunities for private investment became more limited. The Conservative Government of the 1980s tried to increase the role of the private sector, albeit within a tightly regulated framework. The Queen Elizabeth II Bridge at Dartford, opened in 1991, was the first notable modern road scheme to be privately financed; investors were paid back using toll revenues. It served as a model for several projects launched under the Private Finance Initiative (PFI) during the 1990s.

The Private Finance Initiative

The Government officially introduced the PFI in 1992. It allows the private sector to finance large projects, such as the construction of new hospitals, prisons and roads. The Government lays down specifications for each project, and the private sector – usually a consortium of companies each specialising in a particular aspect of the scheme – is responsible for the construction and operation of the infrastructure. A defining feature of PFI projects is the transfer of at least some operational risk from the public to the private sector.⁴⁵ As Roe and Craig explain, this distinguishes PFI from the more nebulous public private partnerships (PPP), such as London Underground, that are effectively backed by government guarantees and can involve less transfer of risk to the private sector. They add: “PPPs also tend to be so complex as to obscure any hope of transparency, are difficult to monitor and have confused lines of accountability.”⁴⁶

*The advantages of PFI projects*⁴⁷

- They provide an alternative funding source for infrastructure schemes. In the short term, more capital projects can be undertaken for a given level of public expenditure and therefore they can be brought on stream earlier. Private organisations may also have greater scope to make use of innovative financial instruments and financing techniques.

43. Albert W, ‘The Turnpike Trusts’, in Aldcroft D and Freeman M (eds), *Transport in the Industrial Revolution*, Manchester University Press, 1983

44. Plowden W, op cit., p 193

45. Roe R and Craig A, *Reforming the Private Finance Initiative*, Centre for Policy Studies, 2004

46. Ibid.

47. See for example, Poole F, *Roads and Private Finance*, Research Paper 97/85, House of Commons Library, 1997

- Private sector skills and expertise are brought into the planning and execution of projects.
- The involvement of private business and a competitive tendering process should lead to better value for money and greater economies of scale.
- Risk can be transferred from the public to the private sector, so that taxpayers do not have to contribute when cost over-runs occur. The level of payments for the specified service is set out in the contract and cannot be increased as a result of unforeseen costs. The PFI can therefore deliver improved price certainty for government departments.
- Incentive structures can ensure the close integration of service needs with design and construction. The design, construction and maintenance companies that comprise PFI consortiums have an incentive to work closely together to protect their long term financial interests.
- The company responsible for building infrastructure is generally responsible for its continued long-term operation, increasing the incentive for consortiums to take a longer term approach to design and construction, and therefore to deliver high standards. There are also strong financial incentives to complete projects on time.

Private finance has been mobilised in many sectors, with varied success. A paper published by the Institute for Public Policy Research suggests that although significant value-for-money gains are made in road and prison PFIs, the improvements in school and hospital PFIs are more questionable.⁴⁸ The National Audit Office (NAO) found that the price ultimately paid by the public sector exceeded the one agreed at contract in 22 per cent of PFI construction projects.⁴⁹ Although this may sound like a high proportion, the figure for projects implemented within the public sector was 73 per cent.

Moreover, the increases in PFI price after contract generally resulted from late changes being made to the project specifications, such as the re-categorisation of prisons to take more dangerous offenders. Such changes would undoubtedly have led to price increases under the traditional procurement process too.

“ Risk can be transferred from the public to the private sector, so that taxpayers do not have to contribute when cost over-runs occur ”

According to the NAO, only 24 per cent of PFI projects were delivered late, compared to 70 per cent within conventional public sector procurement. The delay was more than two months in only 8 per cent of the PFI projects surveyed. These figures show that the PFI has delivered substantial improvements in reliability. It would also appear that most public sector project managers have been satisfied with the performance of their PFI-built infrastructure.⁵⁰

Criticisms of PFI

Despite empirical evidence that the PFI offers significant advantages over conventional procurement, several difficulties have been identified.

- Critics suggest that PFI investment has not in fact brought about a significant increase in the level of investment in capital projects and that the real motivation for employing private finance is to remove investment from the Government's balance sheet in the short term, in effect creating a mortgage on the public sector. Roe and Craig estimated in 2004 that the Government was already committed to pay over £110 billion for PFI projects between 2003-04 and 2028-29.⁵¹

48. Maltby P, 'Public service reform in the UK: the PFI experience', Institute of Public Policy Research, 2003 www.ippr.org/articles/index.asp?id=335

49. *PFI: Construction Performance*, Report by the Comptroller and Auditor General, National Audit Office, HC 371 Session 2002-2003, 5th February 2003

50. *Ibid.*

51. Roe R and Craig A, *op. cit.*, p iii

- The case that the PFI offers better value for money has also been questioned.⁵² The transfer of risk to the private sector means that projects have faced higher borrowing costs, as financiers have demanded a risk premium. In contrast, the Government can borrow at very low rates since repayment – backed by powers to tax and print money – is all but guaranteed. Yet arguably these low rates can be achieved only by transferring projects’ financial risks to taxpayers. Cost over-runs on publicly financed projects involve either higher tax rates or extra government borrowing. The negative economic impact of such measures, as well as the gains in efficiency brought about by the PFI, must therefore be balanced against higher financing costs when assessing the value for money offered by PFI schemes.

“ Arguably, the real trouble has been a mismatch between the long-term planning and investment culture of PFI consortiums and the often short-term politicised nature of the public sector”

- The tendering process for PFI contracts is said to be far more protracted than traditional procurement, inflicting risk and cost on the businesses involved.⁵³ This can deter businesses considering entering the PFI market and undermine competition and innovation. There is a danger that a handful of large operators, with the resources to enter the expensive bidding process, will come to dominate the market.
- PFI projects have been attacked for their lack of flexibility.⁵⁴ Contracts typically set out detailed specifications for a 20 or 30-year period, thereby limiting the ability of the public sector to make future changes and reducing its scope

for innovation. In defence of detailed contracts, without them the main benefits of the PFI could be lost; uncertainty could lead to an increased risk premium on borrowing and reduce the long-term incentives for high construction standards.

Arguably, the real trouble has been a mismatch between the long-term planning and investment culture of PFI consortiums and the often short-term politicised nature of the public sector. In the Second Review of the Private Finance Initiative, commissioned by the Treasury, Sir Malcolm Bates uncovered systemic deficiencies in the management of the PFI process including: a failure to prioritise projects on the grounds of affordability, service need and commercial viability; poor preparation of bids; unrealistic risk allocation in contracts; late cancellations due to policy changes; and the appointment of preferred bidders either too early or too late – all leading to excessive bid costs, lengthy negotiations and weak competition.⁵⁵

According to the review, suppliers were not impressed with public sector procurement in general and felt that “departments were still overly risk averse and naïve in dealing with them”. There was also “duplicated activity, poor use of (and wasted) resources, poor value for money together with uncoordinated and unprofessional dealing with suppliers”.

The review suggested that there were particular skill shortages among local authority officials, few of whom had solid experience of leading complex PFI negotiations with the private sector or in structuring the contractual package underlying PFI deals and resolving issues of risk allocation. “To get real value for money, the public sector must acquire and retain familiarity with the financial products used to create PFI funding practices.”

Possible solutions to this skills deficit include setting up more specialist PFI

52. *Ibid.*, p 7

53. *The Future of the Private Finance Initiative*, Social Market Foundation, 2004, pp 24-25

54. For example, Unison ‘A Briefing on the Private Finance Initiative’, 2004 www.unison-scotland.org.uk/briefings/pfijnov02.html

55. Bates M, *Second Review of the Private Finance Initiative*, HM Treasury, 1999, p 18

units, perhaps based within the main government spending departments rather than the Treasury, and making greater use of independent private sector consultants.

Quoting a Treasury and Cabinet Office review, Bates wrote that the political importance of many PFI projects has meant that officials in both central and local government view the procurement process as high risk and potentially career threatening. The result is responsibility sharing and decision-making by committee, leading to delays. The institutional deficiencies of the public sector, therefore, have contributed to the high costs of the tendering process, which in turn have limited the number of businesses willing to invest in PFI projects.

Transport and private finance

There is considerable experience of private finance within transport. It has been used in both the construction of roads and of public transport infrastructure.⁵⁶ The list of projects suggests that both PFI and PPPs in general are flexible tools when it comes to the transport sector. PPPs have helped to fund very large schemes such as the modernisation of London Underground lines and small ones such as the provision of street lighting in local boroughs. Interestingly, they have involved a variety of public sector partners including the Highways Agency, London Underground, passenger transport executives and local authorities.

Some projects have been perceived as more successful than others, both by specialists and the public at large. It is therefore essential to identify those scheme characteristics that appear to best facilitate successful private investment. The next section examines recent road and public transport projects that have included a significant role for private finance, both through PFI and more broadly defined PPPs.

Road projects

DBFO road building schemes

The roads constructed as design, build, finance and operate (DBFO) schemes appear to be among the most successful applications of the private finance initiative. In the basic model, the consortium constructs the new road and then receives revenues from the Highways Agency, in the form of shadow tolls for vehicles that use it, for the duration of the concession (generally around 30 years). However, in contrast to the situation with a private toll road, there is a cap on revenues – beyond certain traffic levels no more shadow tolls are paid. The Highways Agency therefore avoids the risk that traffic levels will exceed expectations, while the risk associated with lower than expected traffic levels is borne entirely by the private consortium. During the bidding process and subject to them meeting certain quality requirements, consortiums compete according to the lowest shadow toll rate they will accept from the Highways Agency.

“ PPPs have helped to fund very large schemes such as the modernisation of London Underground lines and small ones such as the provision of street lighting in local boroughs ”

Shadow tolls are used instead of direct ones because they have negligible administration costs, do not divert traffic on to parallel minor roads and can easily be applied to discrete stretches of road, without the need for expensive and disruptive toll booths or the development of alternative charging technology.⁵⁷

A penalty points system has been used to encourage DBFO consortiums to provide a good quality service for drivers. Penalties are applied, for example, when the road is taken out of service for repairs.

56. See HM Treasury 'PFI Signed Projects List', www.hm-treas-ury.gov.uk/media/3/6/pfi_signeddeals_110707.xls

57. See Poole F, op. cit.

Variability charges, which make deductions to payments when congestion occurs, may also be used instead of conventional shadow tolls.

DBFO schemes are said to have resulted in significant cost savings – between 14 and 22 per cent for the first eight such projects (depending on the discount rate used).⁵⁸ However, critics have pointed to the lengthy, bureaucratic and expensive bidding process. Also, DBFO consortiums have a vested interest in ensuring a high level of road use in order to extract their maximum revenue from the shadow tolls (these incentives have been modified to a degree in contracts) and thus cannot, it is argued, be involved fully in a wider transport strategy. Contractual arrangements largely insulate DBFO schemes from direct political interference, though those committed to a more top-down model of transport policy consider this a disadvantage. Consortiums still face a degree of political risk, however. For example, the introduction of a national road pricing scheme could significantly affect their revenues, as could a variety of local transport measures.

The M6 Toll

With the exception of a small number of toll bridges, the M6 Toll was the UK's first section of tolled motorway. Designed to alleviate the increasing congestion on the M6 through Birmingham, it connects M6 Junction 4, near the National Exhibition Centre, to M6 Junction 11A north of Wolverhampton with 43km of three-lane motorway. This, the busiest section of the M6, was previously carrying up to two-and-a-half times as many vehicles per day as it was designed for.

A private sector company, Midland Expressway Ltd (MEL), won the 53-year concession to build and operate the M6 Toll (allowing three years for construction and fifty for operation). It was to carry out the design, construction, financing, opera-

tion and maintenance of the road at its own cost and risk, without recourse to government funds or guarantees. A consortium of big contractors (Carillion, McAlpine, Balfour Beatty and AMEC) began work in mid-2002 and the road was opened one month ahead of schedule, in December 2003.

MEL was to recoup its costs by collecting tolls, which it was entirely free to set. The only cost to government of the M6 Toll road was an £18 million contribution towards rebuilding part of the connecting M42. The motorway cost £485 million to build, although Macquarie Infrastructure Group, the Australian company that acquired MEL in 2005, put the total project cost at £900 million. The discrepancy in part reflected high financing costs at the start of the project related to the political risk that final permission to build the road would not be granted, as well as risk associated with the untested nature of such a project in the UK.⁵⁹

MEL reported an operating profit of around £16 million in 2005.⁶⁰ Total revenue was £45 million, with staff and other operating costs amounting to £11.4 million and depreciation of £17.4 million. Taking into account net interest costs of around £43 million, this left an overall loss of £26.5 million in 2005 – its first full financial year. At this stage long term debt was £819 million. Since then tolls have been raised, interest repayments have been reduced through refinancing and a number of large developments, including distribution centres, have been attracted to the vicinity of the route. It is plausible, therefore, that the motorway will return a profit in the medium term.

Although the M6 Toll, in Macquarie's own description, remains a "premium quality road that was delivered on budget, ahead of schedule and with minimum use of taxpayer's funds",⁶¹ it is still too early to judge its commercial success. A number of factors have contributed to this outcome.

58. Haynes L and Roden N, 'Commercialising the Management and Maintenance of Trunk Roads in the United Kingdom', *Transportation*, 26, pp 31-54, 1999

59. Private communication

60. Midland Expressway Ltd, interim financial statements (unaudited) for the six months ended 31st December 2005, www.macquarie.com.au/au/mig/acro-bat/m6toll_financials_enddec05.pdf

61. Evidence given by Macquarie to the Parliamentary Select Committee on Transport *Road Pricing: The Next Steps*, Seventh Report of Session 2004-5, Volume 1

First there are competing toll-free routes, above all the existing M6. Secondly, goods vehicles were originally envisaged to be a major source of revenue but many haulage companies have boycotted the toll road. Hauliers often charge a fixed rate for a delivery and, given their competitive, low-margin industry, the tolls dent their profits – especially where the speed of delivery is of low importance.

Thirdly, traffic predictions were over-optimistic: MEL never published its forecast traffic volumes, but estimates made by transport consultants Steer Davies Gleave group suggested that about 70,000 vehicles per day would be using the road within a year of opening, and 80,000 after three years.⁶² In fact just over three months after opening, average traffic flows were about 47,000 vehicles on a weekday (invariably busier than weekends), and after a year they were still below 50,000 vehicles per weekday.⁶³ Time savings were also over-optimistic. A survey conducted before completion of the road estimated that using the new M6 Toll could reduce journey times by up to 45 minutes, however the maximum time saved has been around 30 minutes.⁶⁴ Comparing journey times on the M6 Toll and on the M6 before the project opened, average weekday journey times are seven minutes shorter south-bound and twelve minutes shorter north-bound. Time savings are not nearly as big as expected, which may also help to explain why traffic has been below the levels forecast during the planning stage.

Finally, financing costs were high, both because of the unique nature of the project and because the consortium had to bear the planning risk: a significant proportion of the total cost was spent before the consortium knew that the project would be granted permission to proceed.

Notwithstanding the project's disappointing financial performance so far, further criticisms have focused on the Government's lack of regulatory power over the

route. Providing certain standards are met, MEL is able to operate the M6 Toll as an entirely independent stretch of road. The Parliamentary Select Committee on Transport has pointed out that, until 2054, the Government's policies, such as national road pricing, high occupancy vehicle lanes and active traffic management can only be applied to the M6 Toll road with the co-operation of the operators. (These issues could be resolved by legislation, renegotiation or compensation, or a combination of all three.)

“ DBFO schemes are said to have resulted in significant cost savings – between 14 and 22 per cent for the first eight such projects (depending on the discount rate used) ”

Some have suggested that because MEL currently has an incentive to maximise revenue rather than minimise overall congestion, a toll-free route – a shadow toll scheme or even a conventionally procured motorway – would have made a far greater contribution to reducing congestion in the M6 corridor and have produced greater overall benefits for the economy.

Public transport schemes

Private finance in public transport schemes has been more controversial than in road projects. It has often been characterised by severe financial problems and persistent contractual disputes with the commissioning bodies. Such projects tend to remain dependent on government subsidies and are therefore vulnerable to political risks; they also have to contend with ideological opposition to private sector involvement from traditionalist public transport administrations. Important lessons can however still be drawn from recent public transport

62. 'M6 Toll Birmingham opens end-2005', *Toll Roads News*, 15th July 2003

63. *Post Opening Project Evaluation: M6 Toll One Year After Study*, Highways Agency, 2005

64. *Road Pricing: The Next Steps*, Seventh Report of the Transport Select Committee, Session 2004-2005

projects in terms of funding, contractual arrangements and the limitation of political risk.

Croydon Tramlink

In 1996 Tramtrack Croydon Ltd (TCL) won a 99-year contract to build and run Tramlink (99 years was considered sufficient time to enable the private sector to view it as a long-term business rather than a limited period concession). The project cost £205 million to construct and opened in May 2000. More than half the capital cost (£125m) was provided as a grant by central government.⁶⁵ The contract was signed by London Transport but in July 2000 its successor body, Transport for London (TfL) was given responsibility for setting tram and bus fares across London.

The predicted passenger numbers were 20 million a year after 18 months of operation and 25 million a year when the system reached maturity after five years, but in reality passenger numbers fell about 2 million short of these figures.⁶⁶ Having taken on revenue risk the consortium initially struggled to cover operating costs, let alone capital repayments, despite the Government subsidy for construction costs.

According to TCL one of the main reasons for the shortfall in patronage was Transport for London's policy of expanding bus services in direct competition to tram routes.⁶⁷ The level of bus mileage operated in Croydon is currently 32 per cent higher than at the time when the concession was granted, with some routes running directly parallel to trams. Secondly, bus fares on competing routes were originally set at a rate 20-30 per cent lower than tram fares. The company took TfL to court claiming that the lower bus fares and competing services had lost TCL up to 8 million passengers and therefore substantial revenue. The court decided that TCL was owed compensation. When fares were harmonised in 2004 there was an immediate

12 per cent increase in passengers using the trams.

TCL made an operating profit of around £2.5 million in the year to March 2005 but its interest payments amounted to £8.3 million.⁶⁸ Tramlink now relies heavily on payments from TfL (£5.8 million in 2004-05) to compensate for the introduction of lower bus fares, competing bus services and Oyster cards, as well as to cover concessionary fares. The scheme is considered to have been a far greater financial failure than the M6 Toll because taxpayers have effectively had to subsidise both the construction and operation of the route. More positively, the use of private finance ensured that construction cost over-runs did not burden the taxpayer. Moreover, the contract was also robust enough to deal with much of the associated political risk and to ensure that insolvency was avoided.

Nottingham Tram PFI

The Nottingham Express Transit (NET) is a relatively successful light rail tram system built and operated under the private finance initiative. Its promoters, Nottingham City Council and Nottinghamshire County Council, awarded the 30.5 year concession to a consortium, Arrow Light Rail. It took three-and-a-half years to construct, and Line 1 opened to passengers in March 2004. The service has proved very popular with both commuters and shoppers.

Behind the scheme's relative success is a payment structure that gives NET incentives without having to take on a large revenue risk that it would be ill-equipped to manage. The councils pay an 'availability' fee to the operator for running the service against performance targets of reliability, punctuality, cleanliness, and good maintenance, etc. In addition, thanks to a ceiling on the possible size of the fee, if patronage is much higher than expected the councils will receive some of the resulting profit.

65. www.publications.parliament.uk/pa/cm199900/cmselect/cmenvtra/153/15306.htm

66. National Audit Office, *Public Transport Review 2004*, www.nao.org.uk/publications/nao_reports/03-04/0304518.pdf

67. Memorandum by Tramtrack Croydon Ltd to the Parliamentary Select Committee on Transport, 2005, www.publications.parliament.uk/pa/cm200405/cmselect/cmtran/378/378we06.htm

68. www.bromleytransport.org.uk/croydon_Tramlink.htm

Also, one of the Nottingham consortium members is Nottingham City Transport, which operates the city's buses. As a result the temptation to run bus services in competition with the tram, as happened in Croydon, has been eliminated. Instead the services complement each other, which fits well with a clear vision of integrated transport. Similarly, since the scheme's promoters are also the planning authorities they have been able to build complementary park-and-ride facilities.

There are plans to extend the Nottingham Tram Line. The Government has agreed to allocate £437 million in PFI credits towards the £578m scheme, and construction work is expected to start in 2010. It is intended that the remainder of the funding will be met locally and a proposal for a workplace parking levy to help raise the funds is being explored.⁶⁹

The Tube PPP

In 2003 three companies, Metronet Rail BCV, Metronet Rail SSL and Tube Lines entered into a 30-year infrastructures services contract with London Underground to upgrade the Tube.⁷⁰ Banks, including Deutsche Bank, UBS, Abbey National and the Royal Bank of Scotland, provided debt financing for the project, which amounted to £2.6 billion in the case of the Metronet contracts.⁷¹ This level of private financing far exceeds that for the DBFO road schemes or the M6 Toll. Under this public private partnership, London Underground (LU) retains responsibility for overall safety and for operating trains and stations. Every four weeks LU pays the infrastructure companies a charge, which is increased or decreased to reflect actual performance and is subject to annual indexation.⁷² The consortiums can improve their revenues through bonus payments if performance is better than the PPP benchmark, which tightens progressively over the life of the contract. Revenue is reduced if performance falls

below the benchmark and the deductions for poor performance are usually twice the size of the increases for above-benchmark performance. The measurement of performance is complex and involves not only the reliability of Tube train services, but also the condition of rolling stock and stations.

“ The PPP was implemented in the face of strong opposition from the Greater London Authority and the rail unions . . . work fell behind schedule and costs greatly over-ran ”

The PPP was implemented in the face of strong opposition from the Greater London Authority and the rail unions. The two Metronet contracts ran into serious difficulties: work fell behind schedule and costs greatly over-ran. The Metronet consortium, whose shareholders are Balfour Beatty, Atkins, EDF Energy, Thames Water and Bombardier, sought a review of its PPP contract in an attempt to increase the payments from London Underground. But, in July 2007, the independent PPP arbiter Chris Bolt decided that LU should pay only a fraction of the sum demanded, and Metronet went into administration.⁷³

London Underground management may intervene to take over maintenance and renewal work although, given their long history of substantial cost over-runs on projects managed in-house (for example, the Jubilee Line Extension), it is not clear that this will prove more efficient. The fact that the public sector appears to be duty bound to complete the work also raises questions about the extent to which risk was transferred to the private sector in this PPP.

The Channel Tunnel

In 1985 the British and French governments invited bids from the private sector

69. www.nottinghamwpl.com/

70. 'The Public Private Partnership', www.metronetrail.com/default.asp?slD=1078753414926

71. See www.ashurst.com/media-item.aspx?id_Content=626&expandOfficeList=true&id_queryContent=&showDetails=true

72. For the two Metronet contracts these payment totalled £660 million in 2005. See 'Metronet under strain as costs over-run', Milmo D, *The Guardian*, 18th April 2007

73. 'Tube company Metronet goes into administration', *The Times*, 18th July 2007

to design, build, finance and operate a link across the English Channel. Eurotunnel, a consortium of banks and construction firms, was selected out of nine bidders. The plan involved building a rail tunnel with a shuttle service for road vehicles.⁷⁴

The Tunnel was financed privately, mostly through bank loans, but also with equity capital from a series of share offers. Unfortunately the project was not a success for investors. Unforeseen geological difficulties delayed completion by a year, leading to additional interest payments and lost revenue. Because the project was technologically challenging, it was difficult to draft a suitable construction contract in advance. This led to cumbersome and costly negotiations, as well as conflict, between Eurotunnel and the contractors TransManche Link. Costs were also inflated by government interference on health and safety issues.

After completion in 1994, revenues failed to live up to forecasts. Passenger numbers were less than half those expected and freight figures also disappointed. The cross-Channel ferry companies cut their prices and competition from budget airlines began to appear in the late 1990s.

Political risk also played a role, since the construction of a state subsidised high-speed rail connection to London was considerably delayed – it having finally opened on 14th November 2007 alongside the re-opening of St Pancras Station as St Pancras International. Rail traffic was so low that a minimum usage charge agreed by British Rail and SNCF in 1987 became a vital component of Eurotunnel's revenues.⁷⁵ In 1997, the two governments provided support by extending the length of the concession from 55 years to 99 years.

While the Channel Tunnel project faced unique challenges, some of its lessons are more widely applicable. The existence of a minimum revenue guarantee and the extension of the concession facilitated private funding at different times, yet were not enough to compensate investors for political and revenue risks, or contractual difficulties between Eurotunnel and TML. Although the size of the scheme (around £10 billion) demonstrates the potential for large-scale private sector funding of major infrastructure projects, its difficulties have undoubtedly left the market more cautious of taking on large revenue risks.

The Cardiff proposals

Although yet to be implemented, a proposed scheme in Cardiff to tackle growing traffic and congestion is particularly relevant to this report. Cardiff City Council has established a transport partnership comprising the local authority, Capita Symonds and Carillion with a remit to improve local transport infrastructure. It plans to introduce road pricing in the form of a congestion charge during the morning peak, possibly from 7am to 10am. Surplus revenues (after operating costs) will finance the planned investment. However, the charge will not begin until the infrastructure improvements are in place or at least at an advanced stage of development. Private finance will therefore be deployed to fund the up-front expenditure, amounting perhaps to £425 million, and future toll revenues will repay the debt.⁷⁶

Capita Symonds will operate the system, while Carillion will manage the construction contracts. It is therefore likely that the revenue risk will be borne by the banks involved and the local authority.

The Cardiff proposal demonstrates the potential for using future road pricing revenues for immediate investment. The involvement of a city authority, banks and leading firms suggests that such projects are perceived as a practical and viable option. If the amounts involved were rolled out pro rata across the country then the impact would be very significant.

74. Gourvish T, *The Official History of Britain and the Channel Tunnel*, Routledge, 2006

75. See Myddelton D, *They Meant Well, Government Project Disasters*, IEA, 2007

76. See 'Trying to squeeze us out of rush-hour car seats', *Western Mail*, 11th October 2006

Building on success

Experience of private finance in transport has undoubtedly been variable. A number of highly successful schemes, particularly new roads, can be contrasted with more mixed outcomes concentrated in the public transport sector. The latter are characterised by poor financial returns, commercial failure and the need for additional taxpayer subsidies. While the specific natures of individual projects make it problematic to reach general conclusions about the criteria for success, the following factors should be considered before schemes based on future road pricing revenues are implemented.

Revenue variability

Traffic predictions for the M6 Toll demonstrate that forecasting future revenues can be problematic. Although traffic volumes have risen roughly in line with economic growth over several decades there can be no guarantee that this trend will continue. A new oil crisis, perhaps caused by political instability in the Persian Gulf region, could dramatically increase motoring costs and lead to a concomitant fall in toll revenues. However the long-term price elasticity of traffic is relatively low and after a period of adjustment following steep price rises, the upward trend tends to resume.⁷⁷

While there may be advantages for the taxpayer in reducing government's exposure to financial risk, this must be balanced against the higher borrowing costs consortiums face when there is uncertainty about future revenues. One solution is that governments provide a minimum revenue guarantee. Should toll receipts fall below an agreed level, the State (whether at local, regional or national level) would top up the project's income. Such an agreement could also reduce the element of political risk (explored below) since there would be an in-built financial disincentive for government to enact policies that might undermine a scheme's viability.

Political risks

The introduction of a road pricing scheme could be abandoned due to public opposition; a fiscal crisis could lead to increases in fuel duty that reduced traffic flows and therefore toll revenues; a hostile local authority could decide to subsidise competing bus services alongside a privately financed tram route – these are just three of the many possibilities that must be addressed when contracts are being drawn up and investment planned. At the same time, the public sector (the Department for Transport, local authorities or other agencies) risks losing policy flexibility if contracts severely limit its ability to act. Such conflicts of interest are inevitable, of course, given that risk must be limited to attract investment at commercially viable rates.

“ While there may be advantages for the taxpayer in reducing government's exposure to financial risk, this must be balanced against the higher borrowing costs consortiums face when there is uncertainty about future revenues ”

The positive aspects of contractual restraints on government action should also be mentioned. They may act as a powerful deterrent to the somewhat arbitrary and short-term changes in direction that have been a frequent feature of British transport policy, and therefore contribute to the long-term stability that would attract large-scale investment for upgrading the infrastructure.⁷⁸ They can also limit the influence of special interests over government transport policy.⁷⁹

Political risk may be reduced when revenue variability is outside the direct control of government – for example, in the DBFO schemes revenues were dependent on shadow tolls rather than direct government subsidies. In contrast, the collapse of

77. Glaister S and Graham D, *Pricing Our Roads: Vision and Reality*, IEA, 2004, p 53. The authors have estimated the elasticity of car traffic with respect to fuel price at -0.35; that is, if fuel prices rise by 10% then car traffic will, after a period of adjustment, fall by 3.5%.

78. See Dudley G and Richardson J, *Why Does Policy Change? Lessons from British Transport Policy 1945-99*, Routledge, 2003

79. Wellings R, 'Environmentalism, Public Choice and the Railways', in *The Railways, the Market and the Government*, IEA, 2006

Railtrack demonstrates that investments can be extremely risky when the financial viability of an enterprise is heavily dependent on direct government support. Clearly such considerations should inform the design of schemes that seek to make use of future road pricing revenues.

Technology costs

Large-scale private investment may also require some limitation of the technological risks of road pricing projects. The possibility of cost over-runs and delays, as seen recently in the German lorry charging system, as well as numerous government IT projects, could deter potential investors. The deployment of relatively modest, tried-and-tested technologies may help reassure private sector participants, though more sophisticated systems could offer a greater range of services for travellers. Assuming that the Government continues to intervene in the transport sector, and that this limits the development of appropriate technologies through normal market discovery processes, one possibility would be for the public sector to assume responsibility for a high proportion of the technological risks facing investors. This would be particularly appropriate for schemes where the public sector retains a large element of control.

Potential upsides

Investors have to be clear about the cost and revenue risks associated with road pricing projects. However, private finance could also be attracted to schemes by the possibility of making additional revenues beyond those derived directly from tolling. If tracking devices (black boxes) were fitted in customers' vehicles, service providers could offer satellite navigation, smart breakdown services and vehicle monitoring (for mechanical defects, for example) as part of the deal.

Another possibility would be for the development of land to form part of a proj-

ect. Historically profits from property development have often made a significant contribution to the viability of privately funded transport infrastructure and indeed expected appreciations in land values have often been the driving force behind the construction of new routes. For example, Olympia and York, the developers of Canary Wharf, were prepared to fund the construction of a new Tube line between the Isle of Dogs and Waterloo.⁸⁰ As part of a scheme to upgrade a particular route, a consortium could be given planning permission to build a new housing estate and retail units at a new intersection or station. The expected development gains could reduce the risks facing investors by providing extra profits and a new source of traffic for additional revenues. Although government planning objectives might mean that this option was rejected in many localities, it nevertheless offers the prospect of greater private sector funding of improved transport infrastructure, as well as increasing the supply of housing.

A favourable investment climate

To upgrade the UK's transport infrastructure will require a large increase in private sector investment in land transport. Fortunately, the success of numerous PFI projects in the transport sector and the long history of private sector funding of communications networks suggest that these objectives are achievable under the right regulatory framework; one in which the private sector has the maximum opportunity to innovate and take advantage of additional profit opportunities. These objectives could be achieved by:

- Using minimum payment guarantees and longer concessions (for example, 99 instead of 30 years) to limit risk and attract a wider range of private investors (including risk-averse pension funds) at lower interest rates.

80. Harrison F, *op. cit.*

- Only passing revenue risk to the private sector when political risk is sufficiently low and when the private sector can be expected to have sufficient information about future passenger levels.
- Removing regulatory obstacles to the planning and construction of privately owned and operated transport infrastructure. Road pricing is likely to transform the viability of such projects, which can be undertaken at no cost to the taxpayer.
- Wherever possible choosing PFI contracts rather than less tightly defined and more complex PPP arrangements. Although PFI schemes may involve transferring a higher proportion of construction and revenue risks to the private sector, they also reduce the potential for costly conflict and political interference, to the benefit of both consortiums and taxpayers.
- Ensuring that private sector involvement takes place in a supportive political environment. Policymakers should have a direct interest in the success of schemes and the private sector should not have to operate in an environment of ideologically driven opposition. Contracts and regulatory structures should make sure that incentives for the private companies and public sector actors are aligned to avoid the kind of conflict that has plagued projects such as Croydon Tramlink and the Tube PPP.

Finally, local and national government may have to forgo a degree of short-term policy control in order to reduce the revenue risks associated with political instability. A suitable institutional framework is therefore an essential requirement for a large-scale private sector contribution.

4

The institutional framework

If we want to use private finance to upgrade our transport infrastructure and introduce road pricing at a later stage, this will require a suitable institutional framework. This chapter therefore examines whether the institutions currently governing the transport sector are appropriate (devolved structures in Scotland, Wales and Northern Ireland are excluded). It also explores alternative arrangements and structures that could best limit the risks facing investors and improve efficiency.

The current system

To limit political risks a degree of institutional stability is necessary, but transport has been subjected to a great deal of political change in the recent past. The complexity of transport governance and its lack – in some areas at least – of clear lines of responsibility deter potential private investors.

The Treasury

At the centre, some readers may be surprised to hear, is not the Department for Transport but the Treasury, which sets the rates of fuel duty and vehicle excise duty as well as levels of government expenditure on transport over the financial year. In effect, the strategic decisions on transport policy are taken here. But this is not without problems because the Treasury has other interests apart from implementing an effective transport policy.

The Treasury's pivotal role has contributed to the misallocation of resources in the sector. In particular, transport

investment has often been subject to substantial cuts in response to short-term financial crises. It has been argued, for example, that the dramatic reduction in the road programme during the early to mid-1990s (as well as the introduction of the fuel duty escalator) had as much to do with high levels of government borrowing as a new-found emphasis on environmental objectives.⁸¹

Transport is a less salient issue than either health or education because the effects of reductions and cuts in investment are not immediately apparent – unlike, say, cuts to welfare benefits. The historical record certainly suggests that short-term political expediency has often overridden arguments about transport's long-term contribution to the economy in the form of higher tax revenues resulting from increased economic growth. In 1998 David Newbery, Professor of Applied Economics at Cambridge University, wrote: "Investment in relieving congestion is controlled by Her Majesty's Treasury, operating tight cash limits and steadily reducing the real resources available. Road transport among all other sectors has been singled out for tax increases to meet our agreed targets on global warming, and the Government appears to be wedded to a policy of rationing transport by congestion and reducing road investments to reduce traffic growth."⁸²

While the investment situation may have improved marginally since this was written – tax increases have been held back and longer-term funding settlements intro-

81. See Dudley G and Richardson J, *op. cit.*

82. Newbery D, 'Fair and efficient pricing and the finance of roads', 53rd Henry Spurrer Memorial Lecture, given at the Royal Society of the Arts, 5th May 1998, p 2

duced⁸³ – it is clear that the fundamental institutional problems remain. Centralisation of power in the Treasury increased under Gordon Brown's chancellorship; although it remains to be seen whether this will change now that he is Prime Minister.

A strong case can be made that the Treasury's broad control over transport policy has been detrimental to long-term and efficient investment and, if continued into an era of road pricing, will deter private sector investment. On the other hand, Treasury oversight has prevented at least some wasteful expenditure by other agencies, such as local authorities. This valuable function could however be performed under alternative institutional arrangements.

The Department for Transport

The Department for Transport oversees the transport sector in England and also undertakes high-level policy development and strategic planning; more routine functions have been hived off to other agencies.⁸⁴ In the post-war period the department was accused of having too close a relationship with the road lobby and displaying bias in favour of roads and against public transport.⁸⁵ As with all government departments, there is a danger that concentrated special interests will gain influence at the expense of the wider public.⁸⁶ As at the Treasury, a bureaucratic culture may stifle innovation and entrepreneurship. Moreover, the centralisation of power within the department means that policy cannot be as precisely tailored to local conditions as it would be if local government had more autonomy.

There have been several dramatic policy shifts within the core institutions of transport governance in the past 15 years; including the cuts in the road programme in the mid-1990s, the decision to force Railtrack into administration in 2002 and the recent abandonment of the lorry charging scheme. Such a record reinforces the

need to consider alternative institutional options for improving the attractiveness of transport infrastructure to private finance.

Other agencies

The Highways Agency,⁸⁷ which was hived off from the Department of Transport in 1994, is responsible for the construction, maintenance and (since 2006) management of motorways and trunk roads; local authorities are responsible for the remainder of roads. With its experience co-operating with the private sector through the procurement process, the Highways Agency could potentially play a key role both in harnessing private finance and implementing road pricing schemes. Other routine functions are carried out by Revenue and Customs (collection of fuel duty) and the DVLA (collection of VED and registration of road vehicles).

Network Rail,⁸⁸ a not-for-profit company, manages railway tracks and stations, and the DfT has been responsible for planning and franchising since the abolition of the Strategic Rail Authority in 2005. Private companies, such as Virgin and National Express, operate rail services through complex franchising arrangements. The role of the rail sector in road pricing schemes would be dependent on whether it was decided to use part of the future revenue stream to fund improvements to rail infrastructure. Although the rail lobby could press for this, there are also ways in which it might harm the rail industry. Using charges to cut congestion is likely to make driving more attractive to business travellers in particular; and congestion-based tolls could deter drivers from catching trains at mainline town centre stations. Any institutional framework needs to recognise the often symbiotic relationship between road and rail travel.

Local and regional bodies

Transport for London⁸⁹ manages London's buses, the Underground, the Docklands

83. For example, a five-year settlement with Transport for London, www.tfl.gov.uk/corporate/about-tfl/investorrelations/4717.aspx

84. For an overview of the Department for Transport's responsibilities see www.dft.gov.uk/about/how/

85. Hamer M, *Wheels Within Wheels: A Study of the Road Lobby*, Routledge & Kegan Paul, 1987; and Henshaw D, *The Great Railway Conspiracy*, Leading Edge, 1991

86. Olson M, *The Logic of Collective Action: Public Goods and the Theory of Groups*, Oxford University Press, 1965; Niskanen W, *Bureaucracy and Representative Government*, Aldine, 1971; Dunleavy P, *Democracy, Bureaucracy and Public Choice: Economic Explanations in Political Science*, Harvester, 1965

87. See: www.highways.gov.uk/aboutus/about.aspx

88. See: www.networkrail.co.uk/asp/111.aspx

89. See: www.tfl.gov.uk/corporate/about-tfl/4510.aspx

Light Railway, some overground railways and London trams, as well as a 400-mile network of main roads, all the capital's traffic lights and the congestion charging scheme. It is responsible for implementing the Mayor's transport strategy for London. One possible institutional model, which might be particularly popular with those keen to promote an "integrated" transport policy, is to create equivalents to TfL in other parts of the UK. However, it is debatable whether TfL has led to more efficient transport provision in the capital. Although the level of central government subsidy to London's public transport has increased substantially, it is far from clear that proportionate improvements in services have occurred (see box). Any assessment is complicated by the role of the Treasury and DfT in setting the framework within which TfL must operate. For example, the Tube's public private partnership contracts – pushed through by the

Treasury despite the Mayor's objections – have limited TfL's control over the improvement to the Underground. The often strained relationships and frequent legal disputes between TfL and the private sector (see Chapter 3) suggest that rolling out London's institutional structure to the rest of the country may not be the best option for limiting political risk and attracting private investment.

Local authorities outside London are responsible for local transport plans, five-year strategies for the development of local integrated transport, supported by a programme of transport measures. They submit bids to central government for the necessary funding (local authority transport spending is largely funded through central government subsidies and in general only a small fraction is raised through local taxes). The Transport Act 2000 provided a legal basis for councils to set up local charging schemes,

The performance of Transport for London

The draft Local Transport Bill 2007 suggests that the Government is keen to promote the creation of mini-TfLs in other cities by strengthening the role of existing passenger transport authorities or creating new ones in cities without them, like Bristol.

TfL's record for economic efficiency is mixed. While the number of bus passenger journeys has increased by more than a quarter since 2000-01, an impressive result, taxpayer-funded bus subsidies have in fact trebled. Bus fares have been kept relatively cheap and concessionary fares greatly extended, including free travel for under-18s, although the economic rationale for these policies is doubtful. Some accuse TfL of being institutionally "anti-car" and deliberately designing road schemes to make driving intolerable so that more people use public transport.⁹⁰ Such bias is evident in the decision to direct a high proportion of congestion charge revenues to bus subsidies. In defence of this decision, such expenditure is more rational in densely populated London than other cities.

There have also been concerns about the composition of the TfL board, appointed by the Mayor, which is accused of lacking political and geographical balance.⁹¹ The Association of London Government, representing the boroughs, has also criticised TfL for "excessive bureaucracy".⁹² Other common criticisms include failure to adequately consult local people and councils and lack of accountability.⁹³

Large increases in Treasury financial support, as well as significant private investment through the Tube PPP, make it difficult to accurately assess TfL's performance. However, it is important that the Government takes on board these criticisms before rolling out a TfL-type model to other cities through strengthening the powers of passenger transport authorities.

90. For example, *Evening Standard*, 23rd July 2007, p 7

91. Michael Gove MP, Public Bill Committee, Greater London Authority Bill, 11th January 2007, Clause 18

92. Lloyd A, 'Borough Transport Spending Priorities and Relationships with TfL', ALG Transport and Environment Committee, Agenda Item 7, 2006, p 4

93. Robert Neill MP, Public Bill Committee, Greater London Authority Bill, 11th January 2007, Clause 18

while the recent introduction of the Transport Innovation Fund will provide substantial resources from central government to support the introduction of local road charging schemes as part of a package of local measures to tackle congestion.⁹⁴ These policies suggest that the Government is planning to give local councils a pivotal role in the introduction of road pricing.

In the metropolitan counties outside London (West Midlands, Greater Manchester, Merseyside, South Yorkshire, West Yorkshire and Tyne and Wear) responsibilities for transport are shared with supervisory passenger transport authorities (PTAs) and associated passenger transport executives (PTEs), which secure services on behalf of the PTAs.⁹⁵ These bodies currently plan and procure local public transport services. However, the draft Local Transport Bill 2007 envisages that their role will soon be extended to include the implementation of road pricing schemes in partnership with local councils.⁹⁶

Their record suggests that extending the powers of PTAs and PTEs is misguided. Between their creation in the Transport Act 1968 and bus deregulation in 1986, “the PTEs became in effect, municipal transport committees, with all the problems of public choice theory attached. They tended also to develop into over-staffed bureaucracies.”⁹⁷ A continued decline in public transport use, related to PTE planners’ failure to match services to consumer demand, coincided with rapid increases in taxpayer subsidies. As economic theory predicts, this central planning model of transport provision, with limited accountability, led to wasteful expenditure and expanding bureaucracy.

Government policy also seems to support giving a greater role to larger regional bodies in England. The Planning and Compulsory Purchase Act of 2004 stipulates that the Government Offices for each

region in England must, in consultation with the DfT, Highways Agency and Network Rail, produce a regional transport strategy to influence local transport plans. Many of the criticisms of PTAs and PTEs are also applicable to regional agencies which, lacking democratic checks, may be even more susceptible to bureaucratic growth and special interest capture.⁹⁸

“ A continued decline in public transport use, related to PTE planners’ failure to match services to consumer demand, coincided with rapid increases in taxpayer subsidies ”

The European Union

It seems likely that in the medium term the European Union will play a greater role in determining the precise evolution of transport governance. In some member countries the EU has funded a high proportion of transport spending to promote regional development objectives. The directive on interoperability of charging systems (2004/52/EU) may also limit the range of charging options and administrative structures possible in the UK:

*“This directive requires in principle that electronic road charging and toll systems should be both technically and contractually interoperable i.e. that there should be a Europe-wide mechanism to ensure that all charge operators exchange information so that users of a range of tolling and charging services across Europe can register with a single service provider of their choice and use a single on-board unit to access all charging schemes within the EU.”*⁹⁹

It is also possible that the EU will intervene in the setting of transport tax rates, perhaps harmonising fuel duties. The

94. For details see: www.dft.gov.uk/pgr/regional/tif/transportinnovation-fund?page=9#a1047

95. See: www.pteg.net/About/pteg/01-ptes.htm

96. Department for Transport, *The Draft Local Transport Bill, Volume 2: Strengthening Local Delivery*, The Stationery Office, 2007, pp 43-53

97. Hibbs J, *Transport Policy: The Myth of Integrated Planning*, IEA, 2000, p 68

98. See, for example: www.gos.gov.uk/goyh/transprts/?a=42496

99. Department for Transport, *Feasibility Study of Road Pricing in the UK*, 2004, Ch 5

European dimension creates another layer of political risk for potential transport investors, although there could be countervailing advantages in terms of reduced discretion for the Treasury.

Institutions and road pricing

Introducing road pricing within the current institutional framework would certainly be possible. However, depending partly on the technology deployed, new bodies may be needed to perform functions such as billing and enforcement.

For example, should charging be operated through fitting on-board satellite navigation technology units to vehicles, then an administrative structure would need to be developed to gather the data and bill customers. Travel information could be processed and invoices sent to registered owners or a pre-paid Oyster-style smart-card system could be used. The latter would probably require a network of outlets where toll credit could be topped up. Enforcement would also be necessary to deal with non-payment, both to ensure that non-paying vehicles were prevented from using tolled roads and to recover debts. Fraud prevention measures might also be required.

The administrative requirements of any road pricing scheme(s) would also depend on the system of taxation (discussed in detail in the next chapter). For example, if vehicle excise duty and/or fuel duty were abolished then this would change the role of both the DVLA and Revenue and Customs. The former's role could be reduced to vehicle registration matters, while the latter could be limited to collecting value added tax on tolls.

Local, regional or national?

A fundamental political question is at what level of government road pricing should be introduced. The choice will be influenced

by the technology available at the time of implementation. As Glaister and Graham have discussed, for large parts of the UK, particularly uncongested rural areas where travel also has a relatively low environmental impact, the administrative costs of charging may exceed the revenues and benefits.¹⁰⁰ Since congestion is concentrated in the largest cities and particular inter-urban transport corridors, it is clear from an economic perspective that the greatest benefits will come from introducing pricing in these locations. Rolling out charging to other areas will depend on administrative and technological improvements reducing the marginal costs involved.

The following section examines a range of different options, from small local projects to nationwide schemes, with regard to their suitability for attracting private finance and improving the economic efficiency of the transport sector.

Private toll roads

Potentially the most devolved solution, private toll roads are also the most radical – and the least likely to gain political acceptance. This would involve entrusting control of roads, at least many trunk roads and motorways (residential roads would be far more problematic), to private owners. New toll roads could be privately developed, while existing major routes could be sold off to companies that would then introduce pricing (the receipts of such a sale could be used to fund public transport investment or returned to the public in some other way). Alternatively, different routes could be floated on the stock market, either individually (for example, M1 plc) or in packages.

This kind of free-market solution would have many advantages. In the absence of bureaucratic involvement and political interference, the widespread misallocation of resources could be avoided. The private sector could also be expected to innovate in order to make the maximum return on its

100. Glaister S and Graham D, *op. cit.*, pp 96-97

road assets, perhaps by introducing high-technology traffic management systems (see Chapter 6). Different methods of charging could also be trialled, and methods could be adapted to local circumstances. For example, conventional toll booths may be badly suited to certain routes. Thus any gradual extension of road pricing would be informed by a wealth of practical experience.

Although competition among different modes of transport does exist – air, rail, pipeline and shipping for example – the privatisation of large parts of the strategic road network may well necessitate regulation to avoid potential abuse of monopoly power and to cap prices. The creation of an independent road regulator would be one option; alternatively an artificial industry structure could be imposed on the network to ensure a certain level of competition. For example, regulation could ensure that the M1 and A1 were owned by different companies. There would, however, be some corridors without suitable alternative highways to ensure competition. One danger is that some traffic would divert to “free” government-owned roads once tolls were introduced. Although the option to use free (but slower) roads would provide some competition to keep tolls down, their use might well have a negative impact on accident rates and ultimately, congestion could be displaced rather than cured.

Of course, in a properly functioning market the existence of “excessive” profits attracts competitors into a market: rival road firms would build rival routes. The land market would also adapt to push economic activity away from expensive roads. Expectation of such effects (as well as the need to optimise revenues) would also keep toll rates in check. Nevertheless, fully functioning competition would require a freely functioning land market and a fast and responsive system for the construction of new schemes. Planning procedures can

delay new roads for decades and involve a high degree of political risk and large transaction costs. The recommendations of the Barker Report, if put into practice, would speed up road projects, but the wholesale liberalisation of the planning system is almost certainly a bridge too far.¹⁰¹ A utility-regulation-style structure is more likely to be feasible in the medium term.

Local authorities

Another possible institutional structure would give local authorities a pivotal role in the administration of road pricing. Indeed, this framework could work in tandem with privately-owned motorways and trunk routes if councils kept responsibility for the remainder of the road network. Alternatively, local authorities could be given control of those trunk roads within their boundaries, as has happened in London with the Greater London Authority (administered through Transport for London).

“ The recommendations of the Barker Report, if put into practice, would speed up road projects, but the wholesale liberalisation of the planning system is almost certainly a bridge too far ”

As long as councils were given sufficient latitude by central government, local schemes tailored precisely to local conditions could be groundbreaking (see Table 4.1). The democratic process, allowing unpopular administrators to be voted out, may well remove the perceived need for competition regulation. At the same time, inter-borough competition would restrain local authorities from charging excessive prices: businesses might relocate if tolls were set too high.

Unfortunately, the current system of local government finance would under-

101. Barker K, *Barker Review of Land Use Planning, Final Report – Recommendations*, The Stationery Office, 2006

mine many of these possible incentive structures. More than three-quarters of council income derives from central government grants rather than local council tax and business rate receipts. There may even be benefits from relative economic decline, as it brings with it the prospect of grandiose, status-enhancing Treasury-funded regeneration schemes.

Moreover, the ability of local democracy to act as a check on council transport policies is also questionable. Transport is just one of many political issues and may not be decisive for voters. At the same time, local elections are held only every four years – enough time for policies to inflict signifi-

cant economic damage. Local democracy may also be undermined by the often incestuous relationship between council officials and local media outlets (they often rely on local government advertising for a large part of their revenue). There is a general danger that the self-interest of local councillors and officials could triumph over economic efficiency.

The current funding regime creates perverse incentives that prevent boroughs from both benefiting financially from policies that encourage economic growth and losing financially when their policies harm the local economy. The widespread introduction of local authority adminis-

Table 4.1: The advantages and disadvantages of localism

Advantages of a devolved approach	Disadvantages of a devolved approach
Competition between areas promotes innovation and efficiency and prevents local areas from being able to impose excessive charges.	The existence of market frictions means that some monopoly pricing will persist and some localities will be priced more attractively than others.
The local democratic process reduces the need for a regulator.	The local democratic process is far from perfect in practice because: <ul style="list-style-type: none"> • of low election turn-outs; • elections are only every 4 years and may be determined by other issues; • of the self-interest of local councillors; • of the tendency for central government to meddle in local government; • local government finance is over-dependent on central government which creates perverse incentives.
There may be less need for expensive technological solutions.	Reduced economies of scale for technological solutions.
Local schemes do not require any centralised data collection.	Charging schemes might not be compatible across the country (although EU regulations address this).
Solutions can be tailored to specific local conditions by policymakers with local knowledge.	Boundary problems whereby through-traffic (which doesn't have an opportunity to vote in the area) is penalised. Trunk roads could however be kept in the hands of a national body, or prices regulated so such discrimination is disallowed.

tered road pricing schemes would be more likely to bring about economic efficiency gains, therefore, if they were introduced alongside fundamental reforms to local government financing.¹⁰² One option would be to remove education and welfare spending from councils, with the remainder of local authority expenditure being funded entirely through local tax receipts (there could even be flexibility on the kind of local taxes used).

Boundary effects: One particular problem for local authority based schemes is the existence of boundary problems. Congestion could be displaced to routes just outside a borough and, since administrative boundaries are largely artificial, certain individuals could be excluded from residents' discounts arbitrarily as a result of small variations in boundary locations. The existence of significant through traffic could tempt local councils to toll certain routes at very high rates in order to exploit travellers with no local vote (a problem with the turnpike trusts in the 18th century). This provides a strong argument for keeping trunk routes outside local authority control and possibly increasing the proportion of roads classified as trunk routes.

Then there are the "second round" effects associated with boundaries. If a toll-free authority were adjacent to a charging borough then businesses and housing could be attracted to the toll-free area. At the same time, local decision-makers would have to balance the economic benefits from such relocation with the economic costs from increased congestion. In economic terms, such inter-borough competition would result in a more efficient use of transport capacity and land. However, these freedoms could conflict with the objectives of government planning policies (urban regeneration, the development of brownfield sites etc.). Thus the desire to prevent the relocation of economic activity as a result of local road pricing could actu-

ally lead to even tighter planning controls, with significant economic costs.

“ The widespread introduction of local authority administered road pricing schemes would be more likely to bring about economic efficiency gains . . . if they were introduced alongside fundamental reforms to local government financing ”

Modal issues: If road pricing is placed in the hands of local authorities then there is an argument that other modes of transport, such as local rail services, should also come under local jurisdiction. This institutional structure would enable better co-ordination between road pricing schemes and public transport schemes. Certainly the gradual expansion of Transport for London's responsibilities to include some overground railways, as well as major roads, indicates that these arguments have gained favour within government.

There is a possibility, as discussed in Chapter 2, that high peak-time road tolls could displace commuters on to public transport. If the railways were to remain largely subsidised by the Treasury, the costs of local decisions could end up being imposed on taxpayers everywhere; encouraging councils to introduce schemes that were economically damaging at a national level. The possibility that local decisions could affect central government expenditure and, potentially, revenue from fuel duty, would create incentives for the Treasury to impose controls on local regimes. This in turn would limit the scope for innovation and the tailoring of schemes to specific conditions.

Regional bodies

Some of the difficulties associated with local administration could be avoided through the involvement of regional bodies. These agen-

102. See Travers T and Esposito L, *I'm a Local Councillor, Get me out of Here!* Policy Exchange, 2004 and *Nothing to Lose but your Chains*, Policy Exchange, 2004

cies could operate charging on trunk roads and motorways, while setting a framework within which local authorities could implement their own schemes according to local conditions. In this way, some of the boundary problems discussed above could be avoided. The regional institutions could also be given responsibility for local rail subsidies and franchising in order to avoid local costs being loaded on to taxpayers nationally, and, hopefully, to improve co-ordination between different modes.

“ In order to gain a high proportion of the economic gains from pricing it may only be necessary to impose charging on a relatively small fraction of the road network . . . it would of course be easier to win public support for a more limited proposal ”

There are, however, profound problems with the regional solution. Would the agencies be unelected quangos or would a new layer of democratically elected government be required? Either of these options is potentially unpopular, both with voters – who, in 2004, rejected plans to create a regional assembly for the North East of England – and travellers.¹⁰³ It is also extremely difficult to calculate the optimal scale of regional governance for the administration of road pricing. Should institutions be based around particular conurbations or travel-to-work areas or the current Government Offices for the Regions?

The best solutions for economic efficiency may create apparently artificial regions that clash with the traditional identities and allegiances of the public, undermining their legitimacy and the decisions they make. The creation of new counties, such as Humberside and Teesside, in 1974 was deeply unpopular with local residents, who felt attached to Lincolnshire, Yorkshire and Durham.

Turnout in local elections is already low and residents may feel little connection with artificial regions such as the East Midlands, so the degree to which the democratic process could provide a check on the behaviour of regional officials is questionable. The increased scale of operations could reduce competition between areas, whereas a decentralisation agenda would promote economic efficiency in local authority schemes. A perceived absence of democratic accountability, combined with concerns about bureaucratic incentives and the lack of competition inherent in this model, could give central government the justification for strong supervision of regional authorities. There is therefore a danger that an expensive new administrative structure would be imposed with few benefits. However, the Government has gradually extended the powers of bodies such as TfL, the PTAs and the Government Offices for the Regions, which suggests that it is keen to develop a tier of transport institutions between the DfT and local councils.

Targeting congestion hotspots

An alternative to creating a number of regional agencies would be to focus on introducing pricing in the worst congestion hotspots. In order to gain a high proportion of the economic gains from pricing it may only be necessary to impose charging on a relatively small fraction of the road network. As Glaister and Graham write: “As a charging scheme is extended progressively to less dense areas the administrative costs are likely to rise while the traffic affected and the economically efficient prices that road users should pay – and hence the revenue – are likely to rise much less rapidly.”¹⁰⁴ It would of course be easier to win public support for a more limited proposal, and the experience gained could improve the efficiency of subsequent schemes.

The schemes would have to be carefully structured to avoid the displacement of

103. See: www.news.bbc.co.uk/1/hi/uk_politics/3984387.stm

104. Glaister S and Graham D, op cit., p 94

traffic on to alternative routes. One solution would be to introduce pricing for an entire transport corridor. On the route from London to the North West through the West Midlands, for example, it may not be sufficient just to toll the M6 to control congestion – the A5, the A50 and several more minor roads may also need to be included.

This institutional framework could be introduced gradually, starting with the worst bottlenecks on the network. In this way, administrative and technological costs, which may be relatively high at first, would be comfortably exceeded by the economic benefits of charging. But finding the right administrative structure for pricing only heavily congested areas will not be easy. Scheme boundaries may have to cut across several different local authorities and residents in some areas could feel unfairly penalised for congestion that they perceive as being the result of decades of government under-investment and mismanagement.

Notwithstanding such problems, a number of institutional options would be available. Pricing authorities could be set up as partnerships between the local councils involved, although arguments over the weight of representation given to each partner and undesirable incentive structures – for example, to overcharge through-traffic – could arise. There is also the usual danger that, without carefully drawn-up rules, these authorities would be unable to limit political risk and would become dominated by special interest politics.

Alternatively, separate government quangos or private companies could be created to administer each scheme – within a framework set by the DfT. A more radical solution would be to auction each pricing concession to the private sector, raising substantial funds for infrastructure investment in the process. The private operators could be subject to independent

regulation on the lines of the privatised utility companies (see below).

National administration

Although targeting congestion hotspots, at least initially, has many economic and political advantages, the idea of a nationally administered scheme appears to have considerable support among policymakers. Of course, a national administration would also be capable of phasing in pricing by focusing on the most congested areas, rather than deploying a politically risky “big bang” approach. Given the severity of congestion in the UK, there is a strong case for rapidly implementing schemes in the worst affected locations using existing technology.

The DfT has sketched out certain components for a possible national institutional framework. However, one potential criticism is that the models discussed tend to be contingent on relatively high-technology options, such as satellite vehicle tracking and automatic number plate recognition, when worthwhile pricing schemes could be quickly introduced using tried-and-tested technology such as toll booths. For example, the DfT’s UK business model describes the organisations and relationships necessary to operate an electronic road charging scheme.¹⁰⁵

The *Communications Gateway Entity* would handle communications with tracking devices installed in vehicles, which would forward location records to the *On Road Services Providers*. The latter’s responsibility would be the installation and operation of the roadside infrastructure and IT systems needed to detect and identify vehicles for charging (perhaps using automatic number plate recognition technology, as with the London congestion charge). Payment Services Providers would register customers, issue bills and collect payment.

The model also envisages the creation of an independent *Data Clearing Operator*, which would collect data from the *On*

105. Department for Transport, *Feasibility Study of Road Pricing in the UK*, 2004
www.dft.gov.uk/pgr/roads/roadpricing/feasibilitystudy/studyreport/feasibilitystudyofroadpricing4002

Road Services Providers and pass the information to the *Payment Services Providers*. In theory this would protect the anonymity of users, since the billing component would be detached from the tracking component. However, many citizens worry about the State gaining access to data on their movements and it is not clear that such a system would be able to deny data access to the police or security services.

“ Mobile phone companies could compete by offering different tariffs to customers, or pre-paid, pay-as-you-go systems, with further anonymity benefits ”

The model aims to “provide a viable and competitive market for the provision and operation of road user charging systems and services, with the long-term objective of providing these cost effectively”.¹⁰⁶ The proposed structure may have been designed with the EU framework in mind (see above), just as an EU directive influenced the structure chosen for the privatisation of British Rail, with central government rather than market forces determining the level of vertical integration. On the railways this raised transaction costs and increased the amount of government subsidy required. There is a danger that something similar could happen on the road network, with disputes over the responsibility for billing errors or journey delays, for example.

The level of competition will tend to be restricted to the provision of support services rather than what really affects the economic efficiency of any scheme – toll levels and infrastructure provision. Policy-makers currently seem in favour of central government continuing to control these vital elements, albeit in consultation with other stakeholders such as local authorities,

PTAs and regional bodies. And, of course, the continuing institutional dominance of the Treasury and the Department for Transport would bring with it political risks that could deter private investment in new infrastructure. Yet, despite these problems there would seem, still, to be plenty of opportunities for the involvement of private finance.

A role for mobile phone companies: Since the private sector would carry out billing and enforcement – in the same way that Capita has operated (and IBM will from November 2009) the London congestion charge – one possibility would be for mobile phone companies to play a role. These firms have demonstrable expertise at processing huge volumes of information and tend to be trusted by customers. Indeed it would be possible to introduce data protection legislation that prevented the State from obtaining access to information held about people’s movements – an option that could ease the public’s fears about being tracked.

A number of different models are possible. The companies could compete by offering different tariffs to customers, or pre-paid, pay-as-you-go systems, with further anonymity benefits. Mobile phone companies could bid against one another for a particular billing concession. In addition to an agreed margin on operating costs, they could benefit from additional profit streams derived from offering a range of services to travellers beyond the core billing function – real-time traffic data, weather forecasts, internet access or even satellite television. Thus the auctioning or franchising of billing services could be an additional source of private funds for transport investment, although the practicalities would clearly be dependent on whether pricing was local, regional or national.

UK investment in transport is low, at least when judged by international comparison. These new sources of funds could

106. *Ibid.*

make a substantial difference to the quality of transport provision and promote widespread public acceptance of pricing. Continuing central government control, on the other hand, will fuel suspicion and undermine economic efficiency. More devolved options have already been discussed, but it is also worthwhile considering a national level alternative for the institutional framework.

Network Road/Roadtrack: The fundamental deficiencies of government management in transport have been recognised by Newbery.¹⁰⁷ He equates these deficiencies with those of other ‘nationalised industries’ that were privatised in the 1980s. They suffered from low productivity, poor allocation of investment and low returns on capital. Different special interests pursued different goals, leading to policy compromise and inefficiency. The solution was to privatise the industries and subject them to regulation, particularly in cases, such as water, where they were perceived to be “natural” monopolies.

Newbery therefore suggests applying this model to the road network, through the creation of a new company that he calls Roadtrack (by analogy with Railtrack), although perhaps a more appropriate title at the time of writing in 2007, would be Network Road. This corporation would be free to raise capital by borrowing and there would clearly be scope for various public private partnership arrangements. As with the utilities, it would be regulated by an independent body, Ofroad, responsible for setting standards and monitoring performance. Ofroad would agree the level of road user charges, planned dividend or interest payments, capital expenditure or forecast operating expenditures.

According to Newbery: “A regulated Roadtrack would have the advantage that it would be able to secure funding to allow the efficient planning of investment, whilst

reassuring motorists that the future level of road charges would not be increased merely in order to finance additional roads.”¹⁰⁸

To avoid the danger that the Treasury continued to insist on influencing the investment budget because the company remained in the public sector, Newbery advocates clear regulatory independence and parliamentary scrutiny.

The unhappy experience of Railtrack has damaged the case for involving the private sector in transport generally, yet there is no reason to believe that the same difficulties would be replicated on the road network where the possibilities for contestability, flexibility and competition are so much greater. The artificial institutional structure of the railways has often made it difficult to separate the responsibilities of train operators and Network Rail – leading to a lack of accountability and expensive transaction costs. However with roads, responsibility for vehicles lies with individuals.

“ The unhappy experience of Railtrack has damaged the case for involving the private sector in transport generally, yet there is no reason to believe that the same difficulties would be replicated on the road network . . . responsibility for vehicles lies with individuals ”

Of course, there are further issues that would need resolving. For example, would Network Road manage all roads or just trunk roads and motorways? If the latter option were chosen the organisation could evolve from the Highways Agency. Would it be organised nationally or at a regional level? Notwithstanding these choices, it is clear that the utility regulation model has been compatible with large-scale private investment in infrastructure upgrades. For example, since privatisation tens of billions of pounds of capital investment have been forthcoming in the water industry, primarily to meet EU regulations.

107. Newbery D, *op. cit.*

108. *Ibid.*, p 10

The Network Road model would also be compatible with competition among service providers for the operation of pricing systems. Indeed, as with the telecommunications sector, where the former monopoly BT was subject to regulation, private infrastructure companies could build (or buy) their own roads to provide competition. Since “public” roads would no longer be free at the point of use, this would be a practical and economically viable prospect, especially because the utility regulation framework could limit the revenue risks associated with the direct political control of transport prices.

A still more radical option would be to privatise Network Road, thereby raising capital on future pricing revenues. Flotation receipts could be earmarked for infrastructure investment or, vehicle owners could be given free shares in the company to reflect in part their historic fiscal contribution and to increase public support.

An opportunity for reform

The introduction of road pricing represents a unique opportunity to improve substantially the institutional governance of UK transport.

While a wide range of institutional structures are compatible with the introduction of road pricing and the concomitant deployment of private finance to improve Britain’s transport infrastructure, certain frameworks look more likely to promote efficient long-term investment in transport infrastructure than others.

Road pricing could transform the prospects for private sector involvement in the transport sector, whether through PFI infrastructure projects, construction of privately-owned toll roads, flotation of parts of the network or auctioning concessions to service providers. These developments would improve infrastructure provision at no cost to the taxpayer as well as introduc-

ing competition, innovation and entrepreneurship. As such, a facilitative institutional arrangement should be sought.

Accordingly, government plans to administer urban pricing schemes through passenger transport authorities and executives require careful scrutiny. The history of PTE-run bus services and the performance of Transport for London indicate that this model risks bureaucratic growth, inefficient expenditure, capture by special interests, lack of accountability and large rises in taxpayer subsidies. Private investors in transport schemes may face ideological opposition and attempts to undermine their revenue stream. Matters could be greatly improved by ensuring a greater degree of political balance in PTAs and PTEs, as well as Transport for London. PTAs could include representatives of local businesses and the TfL board could be made up of borough representatives rather than being appointed by the Mayor.

The probability of local schemes enhancing economic efficiency will be increased if the introduction of road pricing is combined with reform of local government finance such that a far lower proportion of spending is funded through central government grants. Competition for local tax revenues may be the best way to reduce wasteful expenditure and prevent policy capture by special interests. Uncertainties over local tax structures could introduce additional risks, so it would be preferable if reforms were implemented before private investment was sought.

Since congestion is concentrated in the major cities and certain inter-urban bottlenecks it is difficult to envisage a useful role for English regional authorities in transport governance. It is not clear how their involvement would enhance the efficiency of either borough or PTA/PTE-based congestion-targeting or national schemes. A simpler framework could reduce administrative costs and make political risks more transparent to potential investors.

Combined with their apparent lack of public support and accountability, there is therefore a strong case for reviewing the involvement of the Government Offices for the English Regions in transport policy, as well as examining other ways in which governance could be streamlined.

Road pricing offers the opportunity of detaching transport investment from Treasury control. An institutional framework that insulated the sector from the political risks associated with the current degree of central direction would create a favourable climate for long-term infrastructure investment by the private sector. The Government has made progress by creating a legal framework that allows local institutions to keep road pricing revenues and decide how they are spent. But it also needs to address this issue with regard to inter-urban roads. Policymakers must con-

sider converting the Highways Agency into an independent body (Roadtrack/Network Road) with responsibility for administering motorways and trunk roads. An evolutionary process would ensure that the new organisation benefited from the HA's expertise in PFI procurement in order to raise funds for investment. Once widespread road pricing was introduced, the agency would set tolls under the supervision of an independent regulator who ensured fair competition with competing private entrants to the road market and supervised contractual relationships with private service providers.

However, changes to the system of transport governance, though vital, may not on their own be enough to persuade private finance to invest in our transport infrastructure. The system of transport taxation also needs examining.

5

Taxation and Investment

Introduction

The outcomes of road pricing will be affected considerably by the fiscal framework within which schemes operate. Other motoring taxes (VED, fuel tax etc) imposed alongside road user charges may undermine the viability of pricing projects by reducing total consumer demand and absorbing resources that might otherwise be going to pay for investment.

Given the severity of the congestion problem on the UK network, and the knowledge that from a practical perspective new infrastructure can be slow to come on stream, there might be significant economic gains from commencing schemes as soon as practically possible, without waiting for legislative changes to motoring taxation. This chapter examines Britain's current tax regime for land transport and assesses how compatible it is with the need to raise substantial funds for infrastructure upgrades.

Schemes' dependence on long-term road pricing revenues also makes developments in future policy highly relevant. In particular, possible tax increases and charges related to climate change and other environmental impacts must be assessed for their likely impact on both road pricing revenues and the investment climate for transport projects. How can economic efficiency be reconciled with environmental objectives and how might potential fiscal reforms affect the viability of future revenue-based schemes?

Current taxes

Road users currently pay fuel duty and vehicle excise duty in addition to univer-

sal taxes such as VAT. In the financial year 2004-05 revenues from fuel duty and VED raised £32 billion (see Chapter 1), while expenditure on the road network was approximately £8 billion. However, a significant proportion of this £8 billion is not used for the direct benefit of motorists. Instead it is spent addressing the externalities motorists impose on pedestrians, cyclists and bus passengers and on discouraging drivers from using particular routes through traffic calming measures. The £24 billion annual surplus of receipts over expenditure would be sufficient to construct at least 1,200 miles of six-lane motorway, enough to double the size of the motorway network in just two years.¹⁰⁹ If all government transport expenditure is included the annual surplus does drop significantly to around £14 billion; but this sum would still be almost sufficient to build Crossrail.¹¹⁰ Given an appropriate fiscal framework, substantial funds could therefore be available for investment in improving infrastructure.

Road users also pay additional charges such as workplace parking levies, parking fees and fines and face significant expenditure resulting from government and EU regulation on such matters as vehicle standards, MOT tests and vehicle import quotas. Although difficult to quantify exactly, these amounts could, if deregulation freed them up for spending elsewhere, be considered as a potential source of additional revenue for investment.

109. Average construction costs for a six-lane motorway have been estimated at £6.46 million a km in 2003 prices, giving the staggering figure of 2,300 miles per year. See Archer C and Glaister S, *Investing in Roads: Pricing, Costs and New Capacity*, Imperial College London, 2006

110. The total cost of Crossrail was put at between £15 billion and £16 billion in 2005. See: 'Funding concerns keep Crossrail project in the sidings', *The Times*, 7th May 2007

There is an economic argument for imposing apparently high charges on driving. Fuel duty and VED are said to contribute to economic efficiency by reflecting the wider external costs of road use, such as accidents and environmental damage, including that associated with climate change. Attempts are often made to correct such market failure by imposing a tax at a rate that reflects the social cost of an activity, though some market failures result from government intervention.¹¹¹ Thus the Treasury has justified increases in fuel duty for the role they play in “discouraging unnecessary journeys, encouraging fuel efficient cars, and ... reducing emissions of carbon dioxide”.¹¹²

However, during the fuel protests of 2000 Tony Blair seemed to provide a different rationale: “We could, of course, cut more off the fuel duty if we reversed the extra investment we have announced on schools, hospitals, transport and the police. Government is about choices,” he said.¹¹³ Revenues are used for general expenditure rather than to compensate directly those individuals affected by the external effects of road travel or to pay for environmental improvements.

As the transport economist John Hibbs put it: “Private carriages were taxed from an early date, and in 1775 a duty of one halfpenny per mile was imposed on the stage coaches. There is no difference in principle between taxes on travel and the taxation of alcohol and tobacco – or, in their day, the window tax and tea duty. Where demand is highly inelastic, governments will impose taxes (and ‘escalate’ them).”¹¹⁴

Yet the contribution of fuel duty to total government receipts has been falling in relative terms, from 6.3 per cent of net tax and national insurance receipts in the financial year 2000-01 to 5.1 per cent in 2005-06.¹¹⁵ In part this reflected the scrapping of the fuel duty escalator (introduced in 1993) in the 1999 Pre-Budget

Report. The fuel protests of 2000 probably increased the reluctance of the Chancellor to raise rates, particularly in the context of historically high oil prices. Moreover, drivers switching from petrol to diesel engines, which provide greater fuel efficiency and therefore result in lower consumption, have also reduced fuel duty receipts.¹¹⁶

“ Revenues are used for general expenditure rather than to compensate directly those individuals affected by the external effects of road travel or to pay for environmental improvements ”

Sceptical voices have suggested that the levelling-off of revenues from motoring taxes, along with the possibility of electric vehicles, have been key elements in the Government’s desire to introduce road pricing. Additionally, as discussed in Chapter 2, there are strong efficiency arguments for replacing the blunt instruments of fuel duty and VED. Yet setting efficient road prices is no easy task, particularly if the State wishes to limit the role of market mechanisms and wants to balance efficiency with environmental and egalitarian objectives as well as the preferences of the electorate. Difficult decisions will have to be made on transport taxation, including to what extent pricing revenues should replace fuel duty and VED, and whether additional revenue should be sought from pricing to fund investment.

Revenue neutrality

Public opinion surveys indicate that support for road pricing would increase if the new charges were matched by broadly equivalent reductions in fuel duty and/or VED.¹¹⁷ In this scenario the guiding principle would be revenue neutrality, in the sense that the amount of revenue taken by

111. See Rothbard M, *For a New Liberty: The Libertarian Manifesto*, revised edition, Fox and Wilkes, 1994

112. Financial Statement and Budget Report, March 1998, www.archive.treasury.gov.uk/budget/1998/chap5.htm

113. Interview with the BBC, 5th November 2000: www.news.bbc.co.uk/1/hi/uk/1007786.stm

114. Hibbs J, op. cit., p 107

115. Calculated from the Treasury Public Finances Databank, 21st August 2007

116. *Road User Charging: A Road Map*, Social Market Foundation, 2007

117. See, for example, RAC Foundation, 2006, op. cit.

the Treasury would remain constant. However, there is clearly a difference between revenue neutrality for the Treasury and fiscal neutrality for road users. This divergence arises because road pricing could involve significant set-up and administration costs, particularly if a nationwide scheme were adopted. If these amounted to £5 billion per year, for example, this would be equivalent to a 9p rise in fuel duty (assuming a constant level of road use) or a 15 per cent increase in the overall level of motoring taxation.¹¹⁸ Such increases in running costs would make it politically more difficult to raise additional sums for private investment through road pricing.

Yet if a project-based approach were taken initially – targeting the worst congestion hotspots – administration costs would most likely be insignificant in relation to overall road-user taxation. At the same time, radical reform of transport taxes would be very difficult when only small parts of the network were priced and the remainder remained free at the point of use. Some form of fuel duty rebate system might be possible on priced routes, but realistically, whatever the strength of the economic argument, the sheer magnitude of fuel duty receipts means that the Treasury is unlikely to be willing to relinquish them in the short to medium term. It is therefore worthwhile considering scenarios where revenue additionality is achieved. For example, fuel duty and VED receipts could be held broadly constant in real terms, while additional revenues were sought from road users to pay for running costs and extra investment of new schemes. Both the M6 Toll and the London congestion charge are examples of such a model, since users pay the charge on top of fuel duty and VED.

Although the level of infrastructure improvement would be limited under revenue additionality compared with other options,¹¹⁹ it could still encourage much

useful investment. Indeed, as long as the savings from reduced congestion outweigh the running costs of schemes there will be an economic benefit (the pitfalls discussed in Chapter 2 would need to be addressed). Road users as a whole will be better off for as long as the running costs plus the additional charges amount to less than their savings from reduced congestion. A substantial economic surplus should still be available for investment in infrastructure improvements.

Investment potential

- The M6 Toll scheme financed infrastructure investment of £485 million using future toll revenues. The total project cost was put at about £900 million. The standard toll for cars in 2007 was a relatively modest £4.
- The London congestion charge produced total revenues of £213 million in 2006-07 and, due to high operating costs, net revenues of £123 million.¹²⁰ This revenue stream could have been used to raise capital for investment, to part-fund the Crossrail project for example. A more efficient congestion charge with far lower operating costs might have produced sufficient net revenues to raise £2 to £3 billion of investment. (A precise figure is not given as it would depend on unknowns such as interest rates and repayment schedules.)
- The proposed Cardiff scheme, although yet to be finalised, may raise £426 million for infrastructure investment based on future revenues from a £4 charge for cars entering each of two cordons between 7 and 10 am on weekdays. This is a substantial capital sum for a medium-size city.
- The planned scheme for Manchester, which will charge cars up to £5 a day, is expected to bring in net revenues of £118 million per annum. The future revenue stream will be used to borrow £2 billion to pay for capital investment in expanding the Metrolink network,

118. For running cost estimates see: Department of Transport, *Feasibility Study of Road Pricing in the UK*, Annex J, Costs, 2004 www.dft.gov.uk/pgr/roads/roadpricing/feasibilitystudy/studyreport/annexjcosts

119. For example, a road-fund style hypothecation of tax revenues.

120. Transport for London *Central London Congestion Charging – Impacts Monitoring Fifth Annual Report*, 2007 www.tfl.gov.uk

as well as a number of other public transport projects. Central government will also provide a further £1 billion through the Transport Innovation Fund.

Projects focusing on particular congestion bottlenecks certainly appear to be financially viable. For example, a 10p per vehicle-km charge on a six-lane motorway priced to run close to capacity could in a year raise around

£1.5 million per km with a six-hour peak time weekday scheme.¹²¹ This sum would be more than sufficient to pay for widening to eight lanes or, indeed, to construct a brand new six-lane motorway in parallel.¹²²

If pricing were subsequently extended to inter-urban routes then very small additional charges could raise significant funding (see Table 5.1). For example, a 1p a km charge for cars and light vans (just £1.60

Table 5.1: Total annual road pricing revenue at different per km rates (current traffic levels)¹²³

		Goods vehicle charge (pence per km)							
		1	2	5	10	15	20	30	50
Car and light van charge (pence per km)	1	1.6	1.8	2.3	3.2	4.1	5.0	6.8	10.4
	2	3.0	3.2	3.7	4.6	5.5	6.4	8.2	11.8
	3	4.4	4.6	5.1	6.0	6.9	7.8	9.6	13.2
	4	5.8	6.0	6.5	7.4	8.3	9.2	11.0	14.6
	5	7.2	7.4	8.0	8.9	9.8	10.7	12.7	16.1
	6	8.6	8.8	9.4	10.3	11.2	12.1	13.9	17.5
	7	10.1	10.2	10.8	11.7	12.6	13.5	15.3	18.9
	8	11.5	11.6	12.2	13.1	14.0	14.9	16.7	20.3
	9	12.9	13.1	13.6	14.5	15.4	16.3	18.1	21.7
	10	14.3	14.5	15.0	15.9	16.8	17.7	19.5	23.1
Motorways and trunk roads (£ billion)									
		Goods vehicle charge (pence per km)							
		1	2	5	10	15	20	30	50
Car and light van charge (pence per km)	1	4.9	5.2	6.1	7.5	9.0	10.4	13.3	19.1
	2	9.5	9.8	10.7	12.1	13.6	15.0	17.9	23.7
	3	14.1	14.4	15.3	16.7	18.2	19.6	22.5	28.3
	4	18.7	19.0	19.9	21.3	22.8	24.2	27.1	32.9
	5	23.3	23.6	24.5	25.9	27.4	28.8	31.7	37.5
	6	27.9	28.2	29.1	30.5	32.0	33.4	36.3	42.1
	7	32.5	32.8	33.7	35.1	36.6	38.0	40.9	46.7
	8	37.1	37.4	38.3	39.7	41.2	42.6	45.5	51.3
	9	41.7	42.0	42.9	44.3	45.8	47.2	50.1	55.9
	10	46.3	46.6	47.5	48.9	50.4	51.8	54.7	60.5
All roads (£ billion)									

121. Calculation: 10,000 vehicles/hour x 6 hrs x 253 working weekdays x 10p = £1.52 million.

122. See for example, Archer C and Glaister S, op. cit., p 17, Imperial College, London, 2006. The capital cost of motorway widening by one lane in each direction is estimated at £6.69 million per km – a very similar cost to constructing a brand new six-lane motorway.

123. Figures calculated using data from Department of Transport, *Transport Statistics Great Britain*, 2006, Chapter 7. In practice rates charged should vary across different parts of the network to address congestion. Different rates would also affect traffic levels and therefore impact on overall revenue, depending on the elasticity of demand.

for a 100-mile journey), and a 5p per km charge for goods vehicles using trunk roads and motorways (perhaps operated by Network Road) would produce gross annual revenues of £2.25 billion – enough to treble current annual infrastructure investment levels on these parts of the network.¹²⁴ Alternatively, such a revenue stream, which could grow over time as prices and/or traffic increased, could be capitalised to provide very substantial sums for transport investment (perhaps in the region of £30 billion).

Applied to all roads as part of a national scheme, the above charges of 1p and 5p could produce £6 billion per annum gross, enough perhaps to double current investment in all road infrastructure or to raise a very substantial capital sum. Indeed with potential investment capital running into tens of billions it could be necessary to stagger funding to take account of possible limits to the amount of private capital available to be invested in transport infrastructure as well as possible capacity constraints in the construction industry. Thus the introduction of even relatively small road-user charges could revolutionise the level of transport investment in the UK. The model based on future revenue appears to be feasible within the current fiscal framework. Indeed there is further reason (explored in the paragraph below) to believe that schemes will have a positive overall effect on government finances.

The economic dividend

If projects based on future revenue successfully eliminated a significant proportion of congestion, as well as other economic losses from inadequate roads and infrastructure, then the economic benefits would be substantial. If, for example, time savings worth £10 billion per annum were achieved, then the resulting additional economic activity would produce extra revenue for the Treasury. Assuming an overall tax rate of 40-50%, based on recent histor-

ical levels, it can be seen that the sums accruing to the Exchequer would be significant. Since dramatic reductions in congestion would also reduce opportunity costs and increase productivity, boosting economic growth, the extra revenue in the medium term could be even greater. If the public can be made aware of the dynamic effects of road pricing, this should increase support for the measure – especially if the extra revenue could, in time, be used to facilitate cuts in fuel duty and VED.

The carbon problem

Keeping road user charging levels down is a political necessity if road pricing is to gain public acceptance. But it will make it harder to meet EU targets for a 20 per cent reduction in 1990 levels of carbon emissions by 2020. If fuel processing is included, road transport accounts for a quarter of UK emissions, a significant share, so policy-makers may wish to raise fuel duty further and vary vehicle excise duty to encourage greater fuel efficiency and lower emissions.

Notwithstanding the potential unpopularity of such measures, a key difficulty would be setting an appropriate tax rate. According to Stern: “The academic literature provides a wide range of estimates of the social cost of carbon, spanning three orders of magnitude ... from less than \$0/tCO₂ to over \$400/tCO₂ [in 2000 prices]. This is obviously an extremely broad range and as such makes a policy driven by pricing based on an estimate of the social cost of carbon difficult to apply.”¹²⁵

Clearly calculations such as this are largely speculative, since they must make a large number of assumptions about future developments as well as individuals’ subjective valuations. Nevertheless, the estimates contained within the Stern Review can be used to illustrate the level of taxes that could be applied if the principles of Pigovian welfare economics (whereby negative externalities are taxed) were accepted.

124. Based on 2005 data presented in Department for Transport, *Transport Statistics Great Britain*, 2006. It is assumed that the effect of such a small charge on demand would be negligible, that running costs would be low relative to toll receipts, and that pricing revenues would be additional to existing investment in new infrastructure. See Glaister S and Graham D, *op. cit.*, for estimates of the effect of pricing on traffic levels.

125. *Stern Review on the Economics of Climate Change*, The Stationery Office, 2006, p 125, www.hm-treasury.gov.uk

Stern suggests that the current social cost of carbon could be around \$85/tCO₂ (in 2000 prices), which would equate to about 11 pence for a litre of petrol¹²⁶ (or if an equivalent levy were imposed through a pricing scheme, perhaps around 1p per vehicle kilometre for a typical car). Of course, current fuel duties in the UK are several times higher than this figure, meaning the economic case for further rises may be questionable, depending on one's view of other external costs.¹²⁷ Moreover, it should be noted that Stern's estimate is far higher than the mean figure that various surveys of studies have produced. Thus, even charges based on high estimates of the social costs of climate change are unlikely to affect significantly the viability of schemes based on future road pricing revenues.

Longer-term options

Of course, once road pricing had been widely introduced policymakers would be faced with the decision as to whether to abolish fuel duty and VED and replace them with a levy on tolls. The amount of fuel duty paid currently is very closely related to the amount of CO₂ produced by a journey (except on certain modes of public transport which receive a fuel duty rebate from the Government), but road prices would necessarily be linked closely to congestion and not emissions. Indeed, unlike the current fiscal framework of fuel duty and differentiated VED, pricing based largely on congestion will not charge more polluting cars significantly more than other vehicles, because their effect on traffic speeds is the same. Congestion pricing could also lead to a substantial decline in the cost of road use in areas outside the major cities and a relatively small number of inter-urban bottlenecks.¹²⁸ Thus it is possible that in the absence of fuel duty or some kind of carbon levy, widespread road pricing will lead to increases in overall CO₂ emissions.

In the light of government policy on climate change there could be strong pressure to include a charge for carbon emissions as part of any future fiscal framework for road pricing. This might comprise a continuation of fuel duty at a lower rate or some kind of flat rate charge per mile driven or, building on recent changes, vehicle excise duty bands based on the average CO₂ emissions of different models of vehicle. However, compared to fuel taxes, the latter two options are poor proxies for the amount of carbon released.¹²⁹

“ Thus as a method of tackling carbon emissions, fuel duty has a number of advantages . . . In contrast, the integration of carbon charges into road prices could create unnecessary complexity ”

Thus as a method of tackling carbon emissions, fuel duty has a number of advantages. Fuel use is highly correlated with CO₂ emissions and the tax is cheap to collect. Moreover this form of taxation would be compatible with the phased introduction of road pricing or the introduction of tolls only in congestion hotspots. In contrast, the integration of carbon charges into road prices could create unnecessary complexity, for example by creating the requirement to charge different amounts for different vehicle engine sizes and different speeds of travel. Such pricing could detract from the economic efficiency of schemes by both increasing running costs and reducing price responsiveness to congestion. And it would almost certainly have to be introduced on a national scale to capture all CO₂ producing journeys, thereby severely limiting the options available for introducing pricing.

The greatest danger with fuel duty is that, falling under Treasury control, the

126. Spark P, 'Discussion of the Stern Review', Cambridge Energy, 2006, www.cambridgeenergy.com/archive/2006-11-10/cef10Nov2006spark.pdf

127. To provide perspective, fuel tax on a litre of petrol in the UK (exclusive of VAT) is currently around 50p, the price at the pump is £1.

128. Glaister S and Graham D, *op. cit.*

129. CO₂ released per mile depends *inter alia* on the kind of vehicle, the way it is driven, speed and conditions. VED is the same for a vehicle that is barely used as for one that is used regularly.

temptation will remain to increase the tax to pay for general expenditure. A more efficient policy would be to subsume fuel duty within an overall carbon tax that was applied equally to all economic sectors. The method of tax collection could remain the same, but the carbon content of the fuel would determine the rate. In this way the Treasury would be prevented from targeting the transport sector as a special revenue source since any rises would also have to be applied equally to domestic fuel (a high-salience political issue). A further advantage would be that the carbon tax would help ensure cuts in emissions took place in the most cost-effective sectors, perhaps for example at power stations rather than in transport. There is therefore a strong economic case for equalising the taxation of different CO₂ sources.

The Government however favours a different option. Its UK Climate Change Programme of 2006 proposes emissions trading systems for surface transport and envisages including road transport in the EU emissions trading scheme (ETS), possibly from 2013.¹³⁰

While tradable individual allowances for motorists have been considered, the costs of regulating very large numbers of people make it more likely that fuel producers will be given the responsibility for obtaining CO₂ allowances to cover the emissions resulting from the fuel they sell. The additional costs would be passed on to road users in price rises for petrol and diesel.

While this kind of cap and trade system should help ensure that emissions are cut in the most cost-effective economic sectors, according to the DfT: "Inclusion of road transport in EU ETS could ... sit alongside other forms of direct intervention such as fuel duty."¹³¹ Thus it seems likely that the costs of emissions trading would be added on top of fuel taxes, which would undermine one of the fundamental bases of efficient cap and trade schemes – that different sources of emissions are treated equally.

A separate issue is that, in the absence of accurate data on the costs and benefits of climate change, setting the level of the cap is an arbitrary political decision that could harm economic competitiveness while having little effect on environmental impacts. The same kind of knowledge problems will also face policymakers when they attempt to set fuel duty rates or environmental levies based on other external impacts of road use.

Other externality charges

One of the rationales behind maintaining fuel duty in addition to either a carbon tax or the participation of transport within the EU emissions trading scheme, is that road users are also responsible for the production of other externalities apart from congestion and CO₂ emissions.

Attempts to measure the external costs of UK road transport, although methodologically questionable, do tend to agree that by far the largest cost associated with road use is congestion. Because this particular externality would be largely removed by road pricing (even with a relatively small number of schemes focusing on the major cities and inter-urban bottlenecks), it would be hard to justify – on economic efficiency grounds – the kind of large rises in taxation that could jeopardise future road pricing revenues. Sansom et al. comment: "If more differentiated road charging mechanisms were introduced, the case for increasing fuel duties as an, albeit weak, tool for improving economic efficiency would be diluted."¹³²

There are also impacts such as noise and localised air pollution (see Table 5.2). Unfortunately it is extremely difficult to quantify these effects and decide an appropriate levy since, to some extent, they have already been internalised by land and property markets and furthermore, the underlying causes are difficult to separate out.

130. 'Road Transport and the EU Emissions Trading Scheme', Department for Transport Discussion Paper, www.dft.gov.uk/pgr/sustainable/climatechange/euemistrascheme

131. *Ibid.*, p 8

132. Sansom T, Nash C, Mackie P, Shires J and Watkiss P, *Surface Transport Costs and Charges: Great Britain 1998*, Institute for Transport Studies, 2001

Table 5.2: Fully allocated environmental costs of UK road transport in 1998 (central estimate, adjusted to 2007 prices)¹³³

Climate change	£1,793m
Air pollution	£4,028m
Noise	£2,965m
TOTAL	£8,786m

When new roads are built or existing roads widened, nearby property owners are compensated for the loss in value due to noise and other forms of pollution. Subsequent buyers can expect to pay less for properties negatively affected by roads, so to some extent the noise and air pollution they experience is voluntary and has been accounted for in the property market. Although property owners are not compensated for increases in traffic on existing roads, it seems likely that in recent years cleaner and quieter engines, as well as quieter road surfaces, have reduced the associated external effects. Certainly local air pollution levels have fallen substantially over the past 20 years, yet this has not been reflected by any reductions in the rate of fuel duty.¹³⁴

Moreover, when governments and their economists treat noise and local air pollution levels as simply the result of road use they fail to consider all the underlying causes. For example, strict planning regulations have prevented British cities from adapting to cars. Whatever their preferences, most home owners are prohibited from living in quieter locations with cleaner air (as well as less congestion) because government policies force them to live in cramped cities, in many places still heavily reliant on unsuitable Victorian streets. Indeed, new housing developments continue to be built next to major roads and motorways, although there is no shortage

of agricultural land for development.¹³⁵ Should road users pay for the side-effects of these planning policies?

So when national or local policymakers have to set an environmental levy, whether through the continued use of fuel duty or as a variable charge added to road tolls, there is a powerful argument for taking account of the influences of government planning policy and compensation already paid via the land market.

Accident costs

Another possible justification for high road-user taxes or price levies is to pay for the social costs of road accidents. With over 3,000 deaths in 2005 and many more serious injuries, these are very significant. However, it is not clear to what extent there are genuine net economic costs beyond those already covered by road users' insurance premiums. Indeed, previous calculations have failed to take adequate account of the impact on government finances of fatalities, for example, in terms of savings on long-term pensions, NHS and welfare benefits.¹³⁶ Setting an accident levy on road prices that reflected real externalities could be impossible given the difficulties associated with obtaining accurate data on the extent to which costs have already been internalised through insurance.¹³⁷

Accordingly, while the human cost of accidents is extremely high, there is no strong economic rationale for imposing a government accident levy in addition to road tolls. Interestingly however, as discussed in Chapter 2, the integration of road pricing and insurance payments could provide strong incentives for improved safety. Better technology (for example, airbags) is also contributing to a reduction in casualties. Thus accident costs should not be a reason for imposing large additional levies.

Capital costs

Some contend that road users should pay for the capital cost of the road network; the

133. Original estimates from Sansom et al., op cit.

134. See: The Strategy Unit, op. cit., p 58-58

135. Evans A and Hartwich O, *Unaffordable Housing: Fables and Myths*, Policy Exchange, 2005

136. Although it would be morally questionable for the government actually to compensate insurance companies for savings in pension payments, healthcare costs etc. due to road fatalities.

137. Sansom et al., op. cit.. They state that 'No information exists on aggregate injury and death related payments by insurance companies to road accident victims', p 77

interest forgone on its net asset value. Newbery has calculated a capital value of £120 billion for the road network at 1998 prices. At a discount rate of 6 per cent this would mean road users paying £7.2 billion per year.¹³⁸

“ Many road users may feel that they have already paid for these capital costs through what they perceive as excessive motoring taxes ”

Many road users may feel that they have already paid for these capital costs through what they perceive as excessive motoring taxes. Clearly the accuracy of this viewpoint depends on whether it is accepted that historical revenues have more than covered the external costs of road transport and to what extent these costs have been the consequence of government intervention in transport and land markets rather than the result of motoring per se. Thus the methodological difficulties of calculating social costs complicate the decision of what road users should justly pay towards capital costs.

A further consideration is whether road users should pay all the capital costs or whether property owners should pay a proportion, perhaps through local taxes. For example, many rural roads and urban residential streets are constructed primarily to provide access to properties and tolls could probably never cover capital and running costs. The cross-subsidy of such infrastructure would hardly be equitable. Yet in practice it will be difficult to decide how to split charges between property owners and road users, although given the right institutional framework pricing could at least provide better data on the distribution of costs and revenues over the network.

If it is accepted that such charges should be levied in full, policymakers would face

the valuation problem discussed above. Estimating the value of infrastructure outside the market system is extremely problematic. Nevertheless, the introduction of pricing should elicit far better information about the capital value of different parts of the road network, since valuations can then be informed by revenue yields. The notion that road users should cover capital charges does not therefore support the continuation of fuel duty and VED after the widespread introduction of road pricing. Indeed, these taxes would in all likelihood decrease asset values by reducing potential tolling revenues and distorting the allocation of resources among different economic sectors. Capital costs thus provide a further strong argument for a coherent approach to transport taxation and taxes in the wider economy.

Allocating investment

Once the imminent introduction of road pricing guarantees a future revenue stream, the decision then arises as to where investment should be allocated. A key question will be to what extent investment should be based on investors' assessments about consumer demand and profitability (i.e. guided by market mechanisms) and to what extent it should be directed by local or national level policymakers.

At one end of the spectrum could be private toll roads, for which the infrastructure is funded by the purchases of consumers gaining direct utility from it. At the other end of the spectrum could be something like the current system of transport funding, with user charges (and fuel duty, VED etc.) going into a general pot to be spent on the welfare state as well as different transport projects at the discretion of the Treasury and DfT.

In the middle are schemes such as the London congestion charge, where the net revenues are spent on transport, in this case mostly on subsidising bus services. Yet the

138. Newbery, *op. cit.*, p 23

London scheme has more in common with the central planning model than the market-based model of transport investment. The congestion charge revenue is not being used directly to provide services for the travellers that pay it, for example, by investing in measures to improve traffic speeds in central London, such as building flyovers and widening roads.

There are both economic and political problems with centralised schemes. Economically the price signals from motorists paying congestion charges are not translated into investment decisions, and therefore potential gains in allocative efficiency are lost. Outside London, where there tend to be proportionately fewer public transport users and less comprehensive public transport networks, the economic case for earmarking road pricing revenues for, say, local bus services or tram networks, may also be far weaker. Motorists will outnumber public transport users in many localities, so that such an allocation of revenues is likely to raise opposition to road pricing schemes. The apparently successful implementation of the cordon toll ring around Oslo in Norway depended on a large fraction of revenues being earmarked for road improvements.¹³⁹ Motorists thus felt that they would benefit directly from the introduction of charging.

The bias against cars that arguably exists in some local and national administrations (see Chapter 2) raises the danger that revenue will be earmarked for wasteful projects, which fail to produce a commercial return on the capital invested (threatening the involvement of the private finance) and do little to improve the economic efficiency and international competitiveness of the transport sector. We can also expect local authorities to spend revenues to benefit local residents, especially in swing wards where votes count most, in order to maintain political support, rather than focusing on providing services for travellers in general.¹⁴⁰

To avoid waste, central government could, of course, regulate both the modal mix of investment and require that projects meet certain financial criteria. But this could prevent local bodies tailoring schemes to local circumstances, while bolstering central control and Treasury interference in budgetary decisions. Thus the best option may be to reform local government finance so that councils experience the full economic consequences of their transport policy decisions, as discussed in Chapter 4.

“ The apparently successful implementation of the cordon toll ring around Oslo in Norway depended on a large fraction of revenues being earmarked for road improvements ”

Similar decisions would have to be taken at national level should pricing be introduced on motorways and trunk roads. Should a share of revenues be earmarked for cross-subsidising the rail network, for example, even though those paying the tolls would not necessarily benefit from such expenditure? The economic case for such an allocation of resources seems extremely weak, particularly since after the introduction of pricing and the equalisation of environmental taxation travellers would be well equipped to make rational choices. However, this kind of expenditure model would have particular appeal to certain influential fractions of the electorate, such as rail commuters in the Home Counties.

Fortunately the gains from congestion pricing are likely to be sufficient for significant improvements in economic efficiency to be achieved even if a large fraction of revenues is detached from consumer demand and spent for political reasons. Accordingly some economists have focused on models that bolster political support for pricing by widely distributing revenues

139. See Langmyrh T, 'Learning from Road Pricing Experience: Introducing a Second-Generation Road Pricing System', *Planning Theory and Practice*, 2, 1, pp 67-80, 2001

140. See, Tricker R, Fereday D, Pickup L, Norheim B, Bekken J-T, Shepherd S, Laird J, Nash C and Suchorzewski W, *Revenue Use from Transport Pricing: Report on the Implementation of Urban Case Studies, Deliverable 5*, ISIS, 2006

among the general population. Goodwin has suggested applying what he terms “the rule of three”.¹⁴¹ A third of the expenditure could be used for the development and maintenance of new road infrastructure, where the investment would be cost-effective; a third for public transport; and a third for reducing the general tax burden. According to Small, since efficient pricing can produce “more than enough revenue to fully compensate all losses” it should be possible to attract political support from a wide range of interests with a package of transport improvements and tax cuts.¹⁴²

The timetable for introducing road pricing will affect expenditure decisions and thus the feasibility of various spending packages. The economic case for using a high proportion of future revenues for transport investment is likely to be greatest early on, with the first schemes targeting the very worst congestion hotspots. Later, as tolling becomes more widespread, additional transport investment may not be as cost effective in terms of the extra revenues produced. At this stage finding other ways of disbursing toll surpluses could be more important. However, in some urban areas high costs may mean that cost-effective transport investment is not possible on a scale sufficient to absorb revenues, even in the early stages of road pricing. In these circumstances, the reform of local finance discussed in Chapter 4 could ensure that toll receipts were nonetheless used to promote economic growth, for example, by reducing business rates.

Conclusion

Existing and planned schemes, together with hypothetical charging models, suggest that under revenue additionality minimal user charges could produce very substantial funds for investment. Thus in the short to medium term, within the current fiscal framework, the introduction of road pricing does have the potential to improve the

UK’s economic competitiveness by both reducing congestion and providing new funds for investment.

In the longer term, road pricing, even if restricted to just those areas severely affected by congestion, presents an opportunity to reform radically the current system of transport taxation and expenditure. Pricing would undermine the already weak economic case for continuing to use fuel duty and vehicle excise duty; both crude methods of addressing the external impact of road use.

However, a new levy on fuel might be appropriate should policymakers wish to address the carbon emissions of the road transport sector, whether through a carbon tax or the inclusion of road transport in the EU emissions trading scheme. Such a policy should be applied equally across all economic sectors to ensure that emissions reductions are achieved in the most efficient way. Additional climate change related initiatives, particularly those targeting individual sectors such as road transport, would damage the economic efficiency of either a carbon tax or a cap-and-trade scheme, and therefore should be avoided.

Eventually policymakers may also want to introduce an environmental levy on road prices to reflect impacts such as noise and local air pollution. In setting rates, they should attempt to account for the effects of planning policies in exacerbating environmental consequences and the extent to which environmental quality has been internalised in the land market. Further research in this area, perhaps incorporating non-welfare economics approaches, could help policymakers set efficient rates. Nevertheless, the magnitude of current road user taxes, combined with the small additional charges needed to fund substantial infrastructure improvements and the low price elasticity of traffic, mean that even levies based on high estimates of external costs are extremely unlikely to undermine the viability of future revenue-based projects.

141. Goodwin P, ‘The Rule of Three: A Possible Solution to the Political Problem of Competing Objectives for Road Pricing’, *Traffic Engineering and Control*, 29, 10, pp 495-497, 1989

142. Small K, ‘Using the Revenues from Congestion Pricing’, *Transportation*, 19, pp 359-381, 1992

6

Additional policy options

Complementing road pricing with other measures

Using future road pricing revenues to fund infrastructure improvements is not the only available option for addressing congestion and other inefficiencies in the transport sector. Since the construction of additional “hard” transport infrastructure is generally a time-consuming process, private finance deals based on future revenues could be used for other strategies, such as better traffic management, that promise to improve conditions in a shorter time-frame. Rapid and noticeable improvements for travellers will be essential in maintaining political support for both private sector involvement and subsequent user-charging.

The following measures, broadly categorised into active traffic management, demand management and capacity enhancement, are not alternatives to road pricing, but complementary ways of using road pricing revenues.

Active Traffic Management

A number of methods offer the prospect of reducing congestion through making better use of existing capacity. Active Traffic Management (ATM) can be thought of as a tool-box of technologies and procedures for use on their own or in combination. Britain’s first pilot ATM scheme, developed by Serco, was launched on a particularly busy 17km section of the M42 outside Birmingham. The Government announced the project in July 2001, con-

struction began in the winter of 2004 and it was rolled out in three phases over the following two years.

New lighting, gantries, electronic and static signing, emergency roadside telephones and refuge areas, CCTV and advisory speed limits were commissioned first. Then the area was designated a “controlled motorway”, introducing mandatory variable speed limits on the M42. Finally, the hard shoulder was converted so that it can be used as an extra running lane during peak periods or accidents, thereby providing additional capacity.

“ Active traffic management, demand management and capacity enhancement, are not alternatives to road pricing, but complementary ways of using road pricing revenues”

The road is controlled by traffic officers who are able to monitor the road via CCTV. Electronic signs over the motorway can direct motorists to drive on the hard shoulder at busy times. When this measure is in use a 50mph sign is displayed above the hard shoulder to indicate that it can be used and, for safety reasons, a maximum 50mph speed limit is also displayed above the other lanes on the carriageway. Lower speeds can also reduce congestion by decreasing the gap between vehicles and improving traffic flow. Drivers in trouble can pull into the emergency refuge areas located at half kilometre

intervals next to the hard shoulder and equipped with emergency telephones. Regular lanes can also be opened and closed from the control room by displaying a red X on the electronic lane signals above the carriageway. This is particularly useful when there is an incident which requires fast access by emergency services.

Initial evidence suggests that the scheme has been successful at increasing the reliability of journey times, improving safety, and keeping motorists better informed. Accordingly the Highways Agency is currently studying the detailed business case for these schemes.¹⁴³ The cost of the M42 pilot has been estimated at £40 million for the infrastructure and £3.2 million per year for operating costs.¹⁴⁴ Thus this ATM project appears to offer significant cost benefits over widening, which would have been particularly expensive on this edge-of-city location requiring complex intersections. The total economic benefits have been estimated to be in the region of five times the amount spent on the project.¹⁴⁵

Other forms of active traffic management currently under trial in England are motorway access management¹⁴⁶ and the employment of dedicated Highways Agency traffic officers.¹⁴⁷ After the pilots, it seems likely that economies of scale could be achieved if ATM were rolled out to more locations; and the time taken from approval to implementation could be reduced significantly. The introduction of ATM provides an excellent option for PFI schemes based on future road pricing revenues, both as a stand-alone project and in combination with other capacity improvements, such as road widening. The situation is more complex for multi-use urban streets with conflicting interests – this is an area for further research and pilot projects.

Lorry overtaking restrictions

The introduction of overtaking restrictions for heavy goods vehicles is another form of

traffic management that promises to improve flows on motorways and dual-carriageways. Limited restrictions on trucks overtaking have long been employed on German autobahns, particularly on stretches with only two lanes in each direction. When lorries try to overtake one another, especially on hills, they can slow traffic down for several miles; the resulting bunching of faster cars also leads to accidents.

The Highways Agency has begun trialling lorry overtaking restrictions on short sections of the A1(M) in Co Durham and the A14 in Northamptonshire. Providing these pilots are successful there will be a strong case for rolling out this inexpensive measure to other sections of the network that are particularly affected, such as the four-lane sections of the M11 and the M20. These kinds of restrictions could also be applied as part of more comprehensive PFI-funded ATM schemes, although their widespread introduction might be opposed by the road haulage industry.

High occupancy lanes

Carpool or high-occupancy vehicle (HOV) lanes are reserved for passenger vehicles carrying at least two people. They are intended to encourage car sharing, thereby reducing the number of vehicles for a given number of travellers. The lanes are created using the hard shoulder, by widening roads or reassigning an existing lane. High-occupancy toll (HOT) lanes simply charge single-occupant vehicles if they chose to use HOV lanes. Tolls are collected either electronically, by manned booths or using automatic number plate recognition. HOT lanes utilise wasted capacity on HOV lanes and may also be used to raise revenue for investment in new capacity.

The first high-occupancy toll lane was introduced on a state route in Orange County, California in 1995, and was followed by a number of others in both the

143. www.publications.parliament.uk/pa/cm/cm200607/cmhansrd/cm070508/text/70508w0004.htm

144. www.publications.parliament.uk/pa/cm/cm200203/cmhansrd/vo030318/text/30318w01.htm

145. www.highways.gov.uk/knowledge/1334.aspx

146. www.highways.gov.uk/knowledge/9150.aspx

147. www.highways.gov.uk/knowledge/601.aspx

US and Canada. The new lanes have eliminated delay for those who pay to use them and evening peak time delays for vehicles in the mixed lanes have also been reduced.¹⁴⁸

There are persuasive economic arguments against simple high-occupancy vehicle lanes: the lanes may waste valuable road capacity when underused. High-occupancy toll lanes use capacity better and raise revenue. A third alternative would be to introduce simple toll lanes on congested sections of highway. Both high-occupancy and single-occupancy vehicles would be charged the same rate, though the tolls would be more affordable for car sharers.

In the UK, where peak time congestion delays can be very severe, it may be possible to charge relatively high prices for the use of free-flowing lanes. Accordingly, future toll lane revenues could fund widening schemes such as those being undertaken on parts of the M1 and M25. Compared with other road pricing schemes, such projects are likely to be politically popular since they are voluntary, users of both the free and tolled lanes experience time savings and taxpayers must no longer fund investment. Clearly such schemes could form one element of more comprehensive privately financed ATM projects.

There may also be urban locations where premium lanes could be introduced. In some locations cars could be allowed to drive in under-utilised bus lanes for the payment of a fee. Since enforcement based on automatic number plate recognition technology is often already in place this could be a very inexpensive way to make better use of existing capacity on urban roads and raise additional revenue for investment. Bus lane charges would also enable private finance to fund both the widening of roads for new bus/toll lanes and enforcement/tolling infrastructure. There has been talk of allowing high-occupancy vehicles to use the M4 bus lane. This

idea could be extended to allow single-occupancy vehicles to pay to use the lane too – a move that may well prove popular politically.

“ In some locations cars could be allowed to drive in under-utilised bus lanes for the payment of a fee . . . There has been talk of allowing high-occupancy vehicles to use the M4 bus lane ”

Demand management

Another range of policies is designed to reduce demand for car travel both to reduce congestion and the environmental impact of driving. These measures focus on planning controls and regulating the geographical pattern of economic activity as well as transport itself. Policymakers deploy them in an attempt to co-ordinate the competing demands of economic efficiency, equity and environmental protection.

Parking restrictions

Local authorities frequently use parking charges to discourage commuters from driving to work (to reduce peak-time congestion), while setting rates for shorter stays low enough not to put off shoppers from driving to town centres. Thus many municipal car parks are characterised by sharp increases in charges beyond a four-hour stay. Another strategy is to introduce residential parking permits in areas around railway stations and town centres. The former discourages commuters from undertaking part of their journey by car; the latter deters driving to work. The London Borough of Richmond has recently increased the scope of permit policy by charging higher fees for residents owning large 4x4 cars which, it is argued, have a particularly negative environmental impact.

148. Sullivan E, 'Evaluating the Impacts of the SR 91 Variable Toll Express Lane Facility', 1998. Cited in Dahlgren J, High Occupancy/ Toll Lanes: Where Should They Be Implemented?', *Transport Research Part A* 36, pp 239-255, 2002

Under the Transport Act 2000 councils may also impose workplace parking levies, although so far none has done so. Companies also pay additional business rates for parking spaces. These policy options again target peak-time car commuters.

“ Many local authorities treat their parking spaces more like public goods and so ultimately spaces are allocated on the basis of queuing ”

Although parking policies can target particular classes of road users in an attempt to lessen congestion, they are clearly less efficient than well-organised road pricing schemes, which can differentiate according to the distance travelled and traffic levels. Rather than allowing the balance of supply and demand to determine prices, many local authorities treat their parking spaces more like public goods and so ultimately spaces are allocated on the basis of queuing. There is no technical reason to treat parking as anything other than a purely private good; it being both rival and excludable, but too often the internal efficiency of parking allocation ranks secondary to its use in achieving other objectives. Research has shown that cruising for a street-parking space is common in congested traffic because some people prefer to queue than pay to use a car park. Shoup estimated from a review of 16 studies in 11 cities worldwide that on average 30 per cent of traffic in central business districts is looking for a parking space, with the average search time being just over eight minutes.¹⁴⁹ A further drawback of parking restrictions is that they do little to reduce through traffic. In fact, by discouraging parking and thus freeing up road capacity it may even encourage through-traffic on to urban routes.

However, parking policies can, like pricing, have the positive effect of encouraging businesses to relocate away from the most congested areas, thereby making better use of spare transport capacity. They do however raise concerns about the fate of traditional town centre locations. Furthermore, as a fixed cost of travel, parking fees are a lower proportional burden on those making longer trips, and may as a result be regressive since higher income groups tend to live further away from inner cities.

Given these problems and their questionable overall economic efficiency, one of the advantages of urban road pricing is that it would eliminate the perceived need for complex and unpopular parking policies, an aspect of road user charging that could help win public support were it given sufficient emphasis.

Planning controls

Deterring car travel and encouraging public transport have been key components of spatial planning policies, particularly since the mid-1990s.¹⁵⁰ Out-of-town developments have been discouraged; the emphasis has been on developing compact cities to limit travel-to-work distances and create urban densities that promote the viability of bus and train services. The redevelopment of brownfield sites within cities, rather than greenfield sites on the periphery has been an important part of the policy. More directly, some local councils have restricted the number of parking places on new developments to discourage car ownership.

While the aims of these policies may have been laudable, their economic cost has been very high. New dwellings in Britain are among the smallest in the developed world. In fact they are probably smaller now than they were in the 1930s, when the country was only a quarter as rich. A lack of land supply has also contributed to the high cost of homes and the current affordability crisis.

149. Shoup D, *The High Cost of Free Parking*, American Planning Association, Planners Press, 2005

150. Department of the Environment *Planning Policy Guidance 13: Transport*, The Stationery Office, 2004

In the commercial sector, planning restrictions have increased the cost of floor space and may therefore have contributed to the decline of manufacturing. There is also evidence that the controls have contributed to higher retail prices in the UK compared with other EU countries.¹⁵¹

The impact on congestion and the environment is also questionable. Rather than significantly increasing use of public transport, compact cities have arguably concentrated car traffic into a smaller space, increasing levels of congestion and pollution.¹⁵²

While limiting car dependence is only one of the aims of planners alongside conservation of the countryside, urban containment and inner-city regeneration, it must take at least some responsibility for the large negative effects planning policy has had on housing and business. Since road pricing is capable of efficiently and directly addressing the environmental impacts of transport there is a strong case for reviewing the future role of land-use regulation in this area.

Quotas and rationing

In other countries policymakers have gone beyond indirect measures and introduced systems that ration car ownership. In Singapore, in addition to congestion charging that limits vehicle use, various motoring taxes are imposed in order to reduce vehicle ownership. Singapore's vehicle quota system is used to limit annual growth in vehicle numbers to 3 per cent. Certificates of Entitlement – which permit a new vehicle to be driven for ten years – are rationed and auctioned off to the highest bidders every fortnight. The price paid is called the quota premium. As of June 2007 the quota premium was S\$16,181 for a car under 1600cc and S\$19,802 for a car above 1600cc (S\$1 ≈ £0.33). In addition, in 2007 custom duty on imported cars is currently 20 per cent of open mar-

ket value (OMV); goods and service tax is 5 per cent of value at import; additional registration fee is 110 per cent of OMV, and one-time registration fee is S\$140.

“ Since road pricing is capable of efficiently and directly addressing the environmental impacts of transport there is a strong case for reviewing the future role of land-use regulation in this area ”

ket value (OMV); goods and service tax is 5 per cent of value at import; additional registration fee is 110 per cent of OMV, and one-time registration fee is S\$140.

Thus a 1360cc Peugeot 206 with OMV S\$14,870 would actually cost S\$51,414 to put on the road.¹⁵³

Unfortunately there is a perverse incentive problem associated with imposing high taxes on vehicle ownership; having paid so much for a vehicle, owners are encouraged to use them more. In 2003-04 average annual car use in Singapore was 20,171km per car compared with only 11,500km per car in London.¹⁵⁴ Clearly road pricing is more effective at tackling congestion than ownership charges that are imposed whether vehicles are being driven or not. Measures that limit car ownership may also deny those on relatively low incomes the employment and leisure opportunities associated with motoring, thereby increasing social polarisation.

Mexico City uses a system, motivated initially by environmental concerns, called *hoy no circula* (known abroad as “one day without a car”).¹⁵⁵ Every weekday vehicles having either of the day's two *hoy no circula* numbers as the last digit on their registration plates are banned from driving; the aim being to cut car use on weekdays by 20 per cent. But better-off households have got around the system by buying extra cars; thereby reducing the programme's effectiveness. It is certainly a very crude method of tackling congestion because it does not discriminate between motorists with different time values.

151. Evans A and Hartwich O, 2005, op. cit.

152. See: O'Toole R, *The Best Laid Plans*, Cato Institute, 2007

153. Cost S\$ for cars registered in July 2007, www.onemotoring.com.sg/publications/onemotoring/en/Ita_information_guidelines/buy_a_new_vehicle/car_cost.MainPar:0047.File.tmp/Car_Cost_Update.pdf

154. TfL and Singapore Land Transport Statistics, cited in *World Cities Report*, Commission for Integrated Transport, March 2005 www.cfit.gov.uk/docs/2005/worldcities/index.htm

155. See: www.mexicocity.com.mx/nocircula.html

Capacity enhancement

An alternative is to try to satisfy demand by increasing the capacity of infrastructure. In many countries funding is achieved through some form of hypothecation, so that a proportion of road-user tax receipts are earmarked for transport projects.¹⁵⁶ In the absence of both road pricing and a neutral tax system, allocating investment efficiently is difficult. Typically planners tend to underestimate the demand for road space and capacity increases are inadequate to tackle congestion.¹⁵⁷ On the other hand, many public transport schemes, such as the Channel Tunnel and numerous tram projects, overestimate demand for their services, leading to wasteful investment.¹⁵⁸

Road building

The obvious solution to congestion is to build more roads and widen existing ones. *The Roads for Prosperity* programme adopted this approach in the early 1990s, which saw a substantial increase in the rate of road investment.¹⁵⁹ However, new construction met with stiff opposition from environmentalists who engaged in direct action to prevent schemes such as the M3 extension at Twyford Down.¹⁶⁰ The Department of the Environment also undermined the policy from within the Government with support from the Treasury (there was a high budget deficit at the time). The programme was abandoned in the mid-1990s and road building slowed to a virtual halt. And perhaps because of the environmental protests, the Government now prefers to widen existing roads rather than construct brand new ones, even though the former is a far more expensive way of adding new capacity.¹⁶¹

Environmental concerns around building more road capacity could be addressed by increasing compensation payments to affected residents (as in France) and paying them at the start of the construction process, which would restrict the opportunities for radical environmentalists to form

powerful alliances with local residents. As mentioned in Chapter 5, a better way to tackle carbon emissions would be to introduce an economy-wide carbon tax.

One argument often deployed against new road space is that demand is so great that the new capacity will quickly fill up with traffic.¹⁶² “Induced” traffic, as it is termed, is the consequence of the historical mismatch between the supply and demand of roads. It is the result of central control of investment and the lack of economic information in the absence of pricing. User-charging promises both to eliminate congestion caused by induced traffic and guide investment in infrastructure upgrades so that it matches demand for road space more closely.

Road pricing may therefore make road building a more attractive option, by ending the need for taxpayers to fund investment, including an environmental charge, eliminating induced traffic problems and facilitating a far more efficient allocation of investment. However, opportunities for the construction of new capacity are likely to be severely limited within many urban areas. Pricing will mean that the economic viability of such schemes, which may involve the compulsory purchase of hundreds of homes (as with the M11-Hackney link road), or expensive bridging and tunnelling (for example the Limehouse link in Docklands), can be more accurately assessed. Bus projects or spatial dispersal could often bring greater economic benefits in large cities.

Public transport improvements

Another approach to addressing congestion problems is to increase investment in public transport, to improve quality of service and decrease overcrowding problems. Such improvements would encourage more people to use buses, trains and trams rather than cars in order to reduce congestion and the environmental impact of travel. Broadly speaking, this has been

156. Nakagawa D and Matsunaka R, *Funding Transport Systems: A Comparison Among Developed Countries*, Pergamon, 1997

157. See Congleton R and Bennett R, “On the political economy of state highway expenditures: some evidence of the relative performance of alternative public choice models”, *Public Choice*, 84, pp 1-24, 1995

158. See Babalik E, *op cit.*

159. Department of Transport, *Roads for Prosperity*, HMSO, 1989

160. Bryant B, *Twyford Down: Roads, Campaigning and Environmental Law*, E and FN Spon, 1996

161. Archer C and Glaister S, *op. cit.*

162. Department of Transport, *SACTRA report*, HMSO, 1995

the Government's strategy in recent years, together with supportive measures such as the parking restrictions discussed above. Unfortunately, since public transport is subsidised, the cost to taxpayers has been very high: the annual subsidy of buses, trains and trams, which account for a small fraction of passenger travel, is in the region of £10 billion. But passengers could be lost if the subsidy is reduced and higher fares charged.

Government, at local and national level, has also encouraged public transport use through concessionary fares, for example, for the under-18s and over-60s. However, these mean that a high proportion of journeys (on buses in particular) are of limited economic value. A further problem is that subsidised rail journeys encourage long-distance commuting and therefore carbon-intensive lifestyles; commuters, living in rural areas, will use trains to get to work but cars for leisure and shopping trips. Rail commuters are also wealthier than average, meaning that the current level of subsidy is questionable on environmental, economic and egalitarian grounds.¹⁶³ It is an example of "churning" within the tax system, returning money to middle-class taxpayers through subsidies when it would be more efficient to reduce taxes and have them pay for services directly.

The extent to which car journeys can be substituted is also questionable. A high proportion of bus and train journeys terminate in the centres of large conurbations, particularly Central London. Public transport may not be viable in areas with medium to low population densities and it also tends to be unsuitable for journeys from suburb to suburb and for trips involving multiple destinations. Extending provision to such an extent that significant cuts in car usage were achieved may therefore be prohibitively expensive.

Widespread road pricing should give public transport a competitive advantage in large congested conurbations. Invest-

ment in these modes based on future road pricing revenues will be most appropriate in these locations. However, where public transport expenditure is wasteful of resources road pricing will further weaken the case for continued subsidy by undermining justifications that it is contributing to congestion relief and environmental protection.

“ where public transport expenditure is wasteful of resources road pricing will further weaken the case for continued subsidy by undermining justifications that it is contributing to congestion relief and environmental protection ”

Conclusion

While some of the policies discussed can ease congestion, they are generally very crude tools compared to road pricing. Many have negative economic side-effects, which may undermine their cost-effectiveness. In contrast, road user charges tackle congestion directly and can be set at levels that both eliminate delays and allow optimal use of road capacity.

However, in some instances additional strategies may make road pricing more effective. In particular, Active Traffic Management offers the prospect of increasing capacity at relatively low cost. Together with minor changes such as lorry overtaking bans and bus lane tolling, implementing wider ATM promises to reduce congestion relatively quickly. In some locations, however, even use of charges and ATM combined may not be sufficient to address the high demand for road space. Depending on the costs of construction, road building would then be a viable option. The decision would be guided by prices and the financial return on new roads could be calculated more accurately. Given supportive fiscal and

163. The Strategy Unit, op. cit., p 19

institutional frameworks, investment should closely match demand, leading to a more efficient allocation of infrastructure expenditure. At the same time, the pricing of environmental costs would encourage road builders to minimise the impact of projects, perhaps by choosing routes that avoided housing or using ATM systems to limit external effects (for example, by cutting speed limits through urban areas at night).

The privately financed improvement of infrastructure must therefore involve more options than simply building new roads and railways. It should also include a series of complementary measures to reduce congestion in the short term before road pricing is introduced. Such a strategy could play a critical role in maintaining political support for continued private sector involvement in transport projects.

7

Conclusions and recommendations

On international comparisons of transport capacity and congestion the UK comes close to the bottom of the tables. These problems threaten British business and future economic growth. Fortunately, not only can road pricing alleviate the country's endemic congestion, but it can also provide a new source of funding for a major upgrade of the transport network.

We have demonstrated that the addition of relatively small infrastructure charges can provide sufficient resources to increase current investment levels substantially. Yet road pricing remains unpopular and many motorists are suspicious that it will end up being yet another tax on driving. We propose, therefore, that projects should be begun *before* road pricing is introduced. Travellers would then see clear evidence of the direct benefits of road user charging and understand that a significant share of future revenues was being spent on transport rather than absorbed by the Treasury for general expenditure. The maintenance of public support, or at least acceptance, will be essential if the economic benefits of widespread road pricing are to be obtained.

The Private Finance Initiative has been shown to be a suitable method of funding improvements and could build upon the success of the design, build, finance and operate road schemes undertaken in recent years. As Chapter 3 explains, there is strong evidence that, under the right contractual conditions, the PFI offers good value for money in transport procurement. Other funding methods should not, however, be precluded. In some projects, more

complex public private partnerships may be appropriate, while the future introduction of widespread pricing should bring a more commercial approach through the construction of privately owned and operated toll roads. Wherever possible, however, complex schemes with a high level of political intervention, such as the London Underground PPP, should be avoided. We also recommend that government, especially local authorities, makes greater use of private sector expertise in PFI procurement to ensure better value for money and fewer contractual difficulties.

A strong preference for local, regional or national pricing schemes has not been stated in this report. This is because an evolutionary approach may be the best option. A “big-bang” introduction of a national system may introduce unnecessarily large political and technological risks that will act as a deterrent to private sector involvement. It could also delay the implementation of valuable smaller projects that can target the worst congestion bottlenecks. Adequate technology already exists to deploy our future revenue model in such schemes. Given the severity of Britain's congestion problems, a series of such projects should be begun without delay – for example, the introduction of active traffic management at a number of traffic hotspots.

While the deployment of future pricing revenues promises to improve conditions for transport users, there are dangers. Decisions on how to spend the funds could become overly politicised and influ-

enced by institutional bias in favour of public transport. Exemptions could be granted to certain user classes, extra regeneration funding sought, planning controls tightened and taxpayer subsidies increased as car commuters are displaced on to already overcrowded trains and buses – all such consequences could undermine the cost effectiveness of pricing. Investment in infrastructure is likely to be economically efficient only if it retains a strong relationship to consumer demand. Thus, wherever feasible, a significant share of road-user revenues should be spent on road improvements, especially since a high proportion of car journeys cannot practically be undertaken by public transport. However, this is not to say that a share of toll receipts cannot be spent on bus and train projects – this may be particularly appropriate in the largest conurbations where road capacity improvements are not cost effective. Nevertheless, there is a strong argument that public transport users should pay a larger share of the costs of their journeys to ensure that more accurate comparisons can be made with priced roads when both investment and travel decisions are taken.

“ Localism – making local spending dependent on local revenues – can help to ensure pricing receipts are spent wisely. It would provide a strong incentive for transport policies that boosted economic growth rather than satisfied special interests”

Expenditure decisions are, of course, dependent on the institutional framework governing transport. As Chapter 4 explains, the continued central control of infrastructure investment constitutes an additional layer of unwelcome political risk for potential private investors. The Government has already introduced an element of decentral-

isation by allowing local authorities to implement charging schemes and spend revenues how they wish. This report suggests decentralisation should go further. Localism – making local spending dependent on local revenues – can help to ensure pricing receipts are spent wisely. It would provide a strong incentive for transport policies that boosted economic growth rather than satisfied special interests.

There is also a strong case that an independent body should govern the trunk roads and motorways before the introduction of pricing on these routes. This measure could create a stable environment for investment, in marked contrast to the rapid shifts in policy and expenditure that have characterised DfT and Treasury control in recent times. Thus the introduction of widespread road pricing offers a unique opportunity for wholesale reform of transport governance both at local and national level. However, it should be noted that institutional change is not a necessary requirement for funding infrastructure improvements through the deployment of private finance. This model can still be implemented within the current structure of governance, albeit less efficiently.

The introduction of road pricing also raises fundamental questions about transport's fiscal framework, as discussed in Chapter 5. By internalising congestion and environmental costs, user-charging undermines the case for imposing special taxes on motorists such as fuel duty and vehicle excise duty. Yet if road pricing is introduced gradually, it will complicate the tax situation: particularly busy parts of the network may be priced, while the remainder remains free at the point of use. At the same time, the sheer scale of motoring taxation would make it difficult for the Government to find alternative sources of revenue or cuts in public expenditure. The situation is improved, however, by the dynamic economic benefits of road pricing.

ing, even if it is applied only to those locations suffering persistent congestion problems. The Treasury will receive a substantial tax boost from the increased economic growth resulting from reduced congestion and from capacity improvements resulting from increased infrastructure investment. There is therefore a compelling argument that increments in fuel duty and VED should be restrained if a number of charging schemes were introduced in some of the busiest locations.

One argument for raising the fiscal burden is to meet the Government's targets for UK carbon emissions. However, it has been demonstrated that current road user taxes far exceed even the very high estimates of the social costs of a ton of carbon contained within the Stern report. It also seems likely that the most cost-effective emissions reductions will be found in sectors other than transport. We therefore recommend that in the medium term the Government seeks to equalise the taxation of different emissions sources. If policymakers are intent on meeting their targets, then this strategy will see that this is done in the most economically efficient manner.

The same overall strategy should be employed to deal with the other environmental impacts of transport, such as noise and local air pollution. As with climate change, methodological difficulties make it extremely problematic to quantify environmental costs and apply an appropriate charge on vehicle use. Further research is needed to address the fundamental limitations of current valuation techniques and to enable external costs to be efficiently internalised by means other than arbitrary politicised tax rates. Nevertheless, the relatively small charge necessary to fund infrastructure upgrades means that even harsher fiscal conditions and/or high environmental charges are unlikely to undermine the viability of projects based on future pricing receipts.

A greater danger may be political opposition to private sector involvement in infrastructure projects. The recent problems of Metronet and the London Underground PPP have made it even more difficult to promote private investment in transport projects – to both public sector policymakers and potential private sector partners. However, the investment model proposed in this report is very different.

“ It has been demonstrated that current road user taxes far exceed even the very high estimates of the social costs of a ton of carbon contained within the Stern report . . . We therefore recommend that in the medium term the Government seeks to equalise the taxation of different emissions sources ”

First, the kind of investment required to upgrade the infrastructure is unlikely to be forthcoming from the Treasury. Objectors must therefore demonstrate how they would fund it by alternative means. Secondly, since investor returns will come from future tolls from users, unlike the London Underground PPP and many other projects, the accusation cannot be made that taxpayers' money is being used to fuel private profits or that public spending is somehow being mortgaged. Thirdly, the inclusion of minimum revenue guarantees within contracts should reassure investors on political risk. They would act as a very strong disincentive to officials wishing to undermine a scheme's financial viability by introducing subsidised public transport in competition, for example. Indeed, there are numerous ways of limiting private sector risk through contract and the UK is able to draw on a high level of specialist expertise and experience of PFI and PPP projects. Thus the future revenue-based projects advocated here can

avoid the difficulties that have beset a small number of recent schemes.

The economic costs of congestion and inadequate infrastructure are too severe for the Government to continue a policy of prevarication and delay. The upgrading of the country's transport networks cannot, and need not, wait another 20 or 30 years. Our proposal to finance improvements privately using future road pricing receipts promises to quickly deliver substantial benefits to travellers. We have shown that this model is both flexible and robust; it

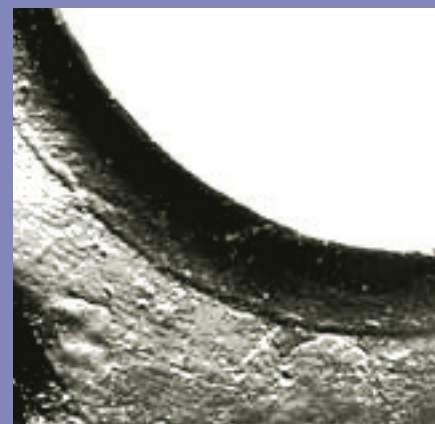
can succeed within different fiscal and institutional frameworks and requires only small additional road-user payments to have a positive impact. The introduction of road pricing gives Britain a unique opportunity to obtain the high quality infrastructure that befits one of the world's wealthiest countries. It will take political courage to implement but the benefits will be many and enduring. With so much room for improvement and a robust and up-front solution available, it would be foolish to delay.

After years of high taxation and underinvestment in transport we face gridlock on our roads and deadlock in transport policy. While the case for road pricing is clear and has been made for a long time, the public is wary of anything that could turn out to be yet another stealth tax.

The solution we propose and investigate is to improve our infrastructure *now* and to repay the costs using road pricing revenues collected *in the future*. This way, the infrastructure can be built without delay and the funding gap met using private finance. Not only would our infrastructure be improved but we would have adopted the most efficient means of managing road space for the future.

This report explores the experience of PFI in transport. It then moves on to detail the institutional and fiscal frameworks governing the sector. It finds that while our current systems of governance and taxation are broadly compatible with road pricing and the concomitant deployment of private finance, certain frameworks look more likely to promote efficient long-term investment in transport infrastructure than others.

Until transport policy takes a different direction, Britain's transport network will continue to deteriorate while our roads become even more congested. This report shows that there is a way to get Britain moving again.



serco

Bevan Brittan 

 policy
exchange

£10.00

ISBN: 978-1-906097-12-7

Policy Exchange
Clutha House
10 Storey's Gate
London SW1P 3AY

www.policyexchange.org.uk