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# Feasibility study of road pricing in the UK - Full report

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## Foreword

Over many years we have invested less than other developed countries in our railways, roads and bus services. Putting that right is a major challenge. Quite apart from the costs, the constraints of urban development and environmental concerns mean that it is not realistic to expect new road capacity to be provided wherever there is congestion. Neither will lavish public transport in itself persuade everyone out of their cars.

Most of the journeys we make by road are hassle-free most of the time. But hold-ups are commonplace at busy places and times. Congestion impacts on our private lives and the environment. It is a brake on our national economy - most delays are on key strategic and urban routes in and around our major cities, where economic activities are concentrated. Without further action, we shall all increasingly suffer from the cost that congestion imposes on our private lives, the national economy and the environment.

That is the context behind our study, which was set up to consider whether it would be feasible to change the way we pay for roads, so as to bring about a more efficient and less congested roads system. A new system of road pricing would mean moving away from the current motoring taxation system, and introducing charges to use roads that vary depending on how congested they are.

Road pricing would help unblock roads to the overall benefit of the economy and the environment. The time savings and reliability benefits that we would get in return for the prices we pay are potentially large - analysis suggests as much as £12 billion a year for Great Britain alone.

If road pricing was implemented nationwide, we would all face different prices for the trips we make. When we travelled on uncongested roads we would generally pay less, but on congested roads we would generally pay more. Paying the family road bill would probably be like paying the phone bill.

While there would be overall benefits, national road pricing would have impacts on all our lives, and on all businesses, which are difficult to predict. It would make us think more about the way we travel and the way we organise our lives. At busy areas and times, there would be a financial incentive to share a car or to travel earlier or later. Bus operators could improve their service frequency with less congestion and higher demand. Where road charges were high, that would signal that road improvements should be considered; and with pricing, expensive road infrastructure, like tunnels in environmentally sensitive areas, could make economic sense.

We have not been able to work out every detail. We have not been able to assess the impacts on a regional basis. Nor have we been able to bottom the impacts on different families and household budgets. Whether, for example, the effects of pricing on the poorer members of society in busy urban areas would be acceptable would crucially depend on getting the details of the pricing right, on the availability of viable alternatives such as public transport or car sharing, and on what use is made of the revenues. More work is needed on these matters.

Past analyses of road pricing have mostly focused on the arithmetic of how charges would need to be set, and what their effects might be. This study has gone on to consider some practicalities - who, exactly, would need to do what to make national road pricing happen? And it has reviewed the state of development of the technology needed to support a national pricing scheme.

The study has found that a national road pricing scheme would probably become technologically feasible in ten years' time. Implementing it would be a massive and complex task, requiring concerted action and co-operation at all levels of government over a number of years.

We have found that a higher degree of public understanding of the benefits of road pricing, and what it would actually mean for individual road users, business, and the wider community would be needed.

Trust and confidence in the viability and delivery of any national road pricing scheme are central to public acceptability. It would cost a lot to run, but it would produce a revenue stream, which could be used for several purposes - to reduce existing motoring taxes, to reduce other taxes, or to fund additional spending on road capacity, public transport or other public spending.

There are real choices to be made here. The benefits of road pricing come not so much from the overall cost, but from the differentiation in cost that it makes possible. Major benefits could be obtained without road users overall paying more than they otherwise would in fuel duty. But additional revenue could fund more transport infrastructure or services, as well as providing higher environmental benefits. The Steering Group does not take a position either way on this issue. Indeed markedly different views were expressed around the table.

The decision on whether road pricing should be pursued is one for central Government. If it wishes to proceed, we see the following as key actions for central Government to take:

- to inform and lead a national debate developing better understanding of what the change would mean and how it might be achieved in practice, with research into how it would affect real families and businesses
- as part of this work, to develop proposals on how receipts from road users would be governed, managed and accounted for, and how motoring taxes would be dealt with on the introduction of any road user charging system

- to engage with other tiers of government and incentivise more practical research and experiments, building on from the M6 Toll Road and the London Congestion Charge, to turn the discussion on road pricing from the abstract to the practical
- to engage actively in the development of vehicle technology standards at an international level.

### Steering Group, Road Pricing Feasibility Study

Robert Devereux (Chair)	Department for Transport
John Dawson	The AA Motoring Trust
Michelle Dix	Transport for London
Prof. George Hazel	Institution of Highways & Transportation
David Holmes	RAC Foundation
Prof. Stephen Glaister	Department of Civil & Environmental Engineering, Imperial College London
Stephen Joseph	Transport 2000
Christopher Macgowan	Society of Motor Manufacturers and Traders Ltd
Brian Nimick	Confederation of Passenger Transport
Michael Roberts	The Confederation of British Industry (CBI)
Lee Searles	Local Government Association
Richard Turner	Freight Transport Association
Steve Gooding	Department for Transport
Stephen Hickey	Department for Transport
Willy Rickett	Department for Transport
Assisted by officials from	HM Treasury Department for the Environment, Food and Rural Affairs Scottish Executive National Assembly for Wales Department for Regional Development, Northern Ireland

## Chapter 1: Introduction

1.1 This chapter describes the background to the study, and in particular:

- its terms of reference
- key areas of work undertaken
- the remaining structure of this report.

## **Background to the study**

1.2 In July 2003, the Secretary of State for Transport published 'Managing Our Roads' [1]. This document set out the challenges that the country faces over the next 20 to 30 years in providing opportunities to travel, as the economy grows, while taking account of the impact on the environment. It found that we could not build our way out of all the problems we face, but should seek to make better use of the capacity available.

1.3 The paper was published against the background of a number of multi-modal studies which aimed to find sustainable solutions, without prejudging the relative contributions of different modes of travel, to the current and projected transport problems in certain key areas. One of the recommendations of the studies was that the benefits of additional capacity should be locked in, rather than letting increases in speed and reliability be eroded by an increase in traffic. This lock-in would be provided by demand management measures, which would include the use of road charging in order to limit demand for otherwise congested roads.

1.4 In the light of this, the Secretary of State set up a comprehensive study to examine the possibilities for charging. The terms of reference for the Study are set out later on this page.

## **The study**

1.5 We have commissioned a wide range of work on which we have been assisted by a secretariat in the Department for Transport. The main results of this work are set out in the annexes, and inform the argument in the body of the report.

1.6 The work comprised:

- analysis of modelling undertaken mainly using the DfT's National Transport Model and models from certain multi-modal studies of geographic areas which were available to us
- a review of existing schemes around the world
- a review of existing technologies and an assessment of the direction and pace of technological development
- a review of attitudes to road pricing around the world
- some original qualitative and quantitative research into attitudes
- studies into the potential impacts of road pricing on different social groups and on the environment
- an assessment of the legislative and devolution issues to which road pricing would give rise
- an exploration of the potential costs of implementing a range of road pricing schemes.

1.7 We have not been able to bottom every issue. In particular we have not been able to develop an evidence base for the full impacts of road pricing on trade and industry, the regions or social inclusion. These require either more evidence from actual experience of road pricing or further development of theoretical models.

## The report

1.8 This is a report into the feasibility of road pricing in the UK. It is therefore concerned with whether and how road pricing might work, not with whether it should be adopted. As will be apparent from the conclusions the study reaches, the question as to whether road pricing should be adopted - and how - is complex, and very much one for the Government. It has become apparent that national road pricing will need the collaborative effort of government at all levels, national, devolved, and local. It is difficult to see this happening if there is not a sound and sufficient degree of public consensus or acceptance in its favour.

1.9 To address whether and how road pricing might work, this report assesses, in turn:

- feasibility in terms of the degree of public acceptance pricing might have, and the determinants of public opinion (Chapter 2)
- the 'why?' - the wider transport context, the trends in traffic and congestion that are forecast without pricing, and the drivers of congestion in terms of the travel choices people make (Chapter 3)
- the 'how?' - the technological practicalities of applying road pricing, based on an assessment of the way technology is developing, how pricing might work, and the modelled impact it might have, and identifies the factors that would need to be taken into account in scheme design (Chapter 4)

## Terms of reference for the Road Pricing Feasibility Study

To advise the Secretary of State on practical options for the design and implementation of a new system for charging for road use in the UK.

The study should take into account the following objectives for any new charging system:

- to deliver a more efficient approach to the structure of transport pricing
- to be fair, respect privacy, and promote social inclusion and accessibility
- to deliver higher economic growth and productivity for all regions of the UK
- to deliver environmental benefits.

The advice should cover:

(i) the options for the structure of the charging regime

(ii) the estimated impact of each charging regime, based on a range of scenarios. The impacts should include those on congestion and accidents, on the environment (in particular, energy consumption, carbon emissions and local air quality), on public and private modes of transport (including rail and air), on different groups of people and on different areas (including urban and rural areas)

(iii) the relationship with congestion charging schemes already in place

(iv) legal issues, and in particular, safeguards for confidentiality

(v) the options for the technology used for the scheme (including issues of interoperability with other schemes here and abroad) and the potential costs of introduction and operation

(vi) the options for managing the transition to a full scheme and potential timetables, including the need for practical tests and research.

- the 'who and what?' - who would need to do what, the different roles for central and local government. Who exactly would decide to implement a scheme, set the charges and spend the revenues (Chapter 5)
- the 'when?' - how soon might it be possible to establish a national scheme and what might be done in advance of that (Chapter 6)

and then sets out the conclusions of the study and possible next steps if road pricing is to be taken forward (Chapter 7).

[1] Published by the Department for Transport in July 2003.

## **Chapter 2: The importance of public opinion**

2.1 This chapter explains that a degree of public acceptance is critical to the feasibility of road pricing. It:

- explains what we know about attitudes to road pricing
- explains that current perceptions are based on respondents engaging with pricing largely as an abstract concept. Attitudes change when a fully developed proposition is laid out, and again when it is experienced
- identifies that benefits need to be explained clearly, and that choice and trust are key issues.

### **What we know**

2.2 The potential benefits of road pricing have been advocated for some time, and the ability to undertake local charging schemes has been with us for some years. Singapore introduced its first scheme in 1975. Norway has several schemes, Durham has a small scheme to minimise traffic in its historic centre, and London has introduced a major scheme. But other public authorities in this country and elsewhere have found it difficult to progress schemes.

2.3 Previous studies into road pricing have focused on economic benefits and the ability of technology to deliver them. They tend to gloss over a key point, namely public acceptability. To put it bluntly, if the benefits are so good, and the technology can deliver, why aren't more public authorities around the world implementing road pricing to improve their competitiveness, protect their environment and promote social inclusion?

2.4 The simple answer is that any form of road pricing will bring about change. Explaining the benefits so that people understand that change will be for the better is difficult. Most studies also concentrate on the overall net benefits to road users and others, neglecting the fact that road users are every bit as diverse a community as society at large. We all use roads, either as pedestrians, cyclists, drivers, or as passengers in cars or buses. Even if we never left our homes we would consume goods that needed to be delivered to us by road. We recognise that congestion is a growing problem, but we want to understand the implications of change as it will affect us personally.

2.5 This study has therefore undertaken considerable work to improve our understanding of public attitudes to road pricing. This is summarised below and in more detail in Annex D, but still does little more than scratch the surface. The key points which emerge are that:

- to accept road pricing, people need to agree that it would deliver a solution to a problem which they can see needs addressing. They want to see choice
- trust is crucial. People need to be confident that road pricing is designed to deliver transport and other benefits, rather than as a means of raising more revenue.

2.6 We have focused on the attitudes of individuals, rather than on those of industry and commerce. This is because organisations such as the Confederation of British Industry and the Freight Transport Association have long favoured road pricing in principle. Our expectation is that the business community would welcome a new approach to paying for roads if it delivered better journey reliability at reasonable cost.

## **Overview of attitudes**

2.7 Public acceptability is key to the successful implementation of road pricing. We therefore commissioned a series of studies examining what people think about the issues. We have also been able to learn from previous research, though we recognise that we have only started to scratch the surface in this area.

2.8 Our research shows that people do not want to pay more for road use. However, they also agree that the current system of payment does little for tackling congestion, and that paying for usage more directly could be of potential benefit. Only a small minority of people (11 per cent) think that the current system does not need some form of alteration.

2.9 It is important to acknowledge in this discussion that in behavioural terms, motorists are not a homogeneous community: the reasons why people make trips by car when they do, and where they do, depend on many factors, both social and geographical.

People from poorer households or living in more deprived areas are less likely to travel by car on their regular journeys, and also tend to travel shorter distances than people from better-off households or in less deprived areas.

Older people travel shorter distances on their regular journeys.

2.10 We know a lot about the sort of trips people make now, but in introducing a change such as road pricing, we would need a more sophisticated understanding of which pricing propositions would promote and protect the accessibility they need. It is clear from our initial research, though, that travel behaviour differs markedly across a range of social and geographical characteristics; a 'one-size fits all' model of road pricing is unlikely to fulfil the public's needs.

### **Urban/rural**

- In rural areas more people drive, and fewer use public transport.
- People travel further on their regular journeys in rural areas than in urban areas.



## **Regional differences**

- In London, more people use public transport, and fewer travel by car. The opposite is true for the South West.

2.11 Because people have different travel patterns, often according to their social circumstances or geographical location, people also have different requirements and wishes depending on these circumstances. Accordingly, our research has demonstrated that just as travel behaviour varies according to characteristics such as age or occupation, so too do attitudes to road pricing. Not surprisingly, these attitudes are also affected by where people live and by their experiences of charging or of using public transport.

More of the people living in the most deprived areas than in more affluent areas say they would find it easy to change to another mode of transport if road pricing were introduced.

More people from relatively wealthier households consider car travel to be essential for their work.

2.12 It is important to acknowledge these differences in this discussion, as different patterns of behaviour have significant implications both in terms of varying opinions towards road pricing among different groups, and also with regard to the equity of any road pricing scheme in its effects on different population groups. Just as travel behaviour differs between different groups, so too will opinions on road pricing. It is important to ensure that a new system is as attractive to as many types of people as possible.

2.13 The vast majority of people, regardless of social factors, do not want to pay any more to use the roads. However, there is a recognition that a system of paying at the point of use would be more likely to encourage people to think about the journeys they make. If road pricing were introduced, public acceptability would depend largely on what people thought was the rationale behind its introduction, and how far they could trust government to deliver its objectives. A majority (60 per cent) would accept a change in the system if overall levels of car tax did not increase. 66 per cent agreed that they would be prepared to accept road pricing if there were good alternative ways to travel. But some have concerns over whether the Government could be trusted to implement fairly particular types of schemes.

## **Urban/rural**

- More respondents living in rural areas say they would find it difficult to change to another mode if road pricing were introduced.

## **Regional differences**

- More people in the South West and Wales think car travel is essential for their work.
- Residents in the South East and Scotland are more in favour of road pricing to prevent road building than those from other regions.
- More Londoners think they would drive more often if there was less congestion than people in other regions.
- More people from the South West say they would also find it difficult to change to another mode if direct charging were introduced. London is the area where least people say they would find it difficult.

2.14 Therefore, an important factor in the acceptability of road pricing is the availability of alternative forms of transport to use in making a journey - such as public transport - or the option of using an alternative road to the same destination without incurring a charge. If a higher charge were to be made, people would be keen for potential increases in revenue raised through road charging to be channelled back into transport funding, both public transport schemes and road-building/maintenance, and they would want to see clearly what use was being made of the revenue.

2.15 Public concerns regarding the issue of privacy and satellite-based charging schemes do not appear to be as widespread as may have previously been thought; for example in March 2004, 62 per cent of those surveyed did not regard it as a major issue. However, the sizeable minority who do have concerns about issues of privacy have strongly held beliefs on the subject. These concerns also relate to the technology that could be used as part of a road pricing system. There is little public understanding of what this would actually entail in terms of its effects on people's day-to-day lives, and what people would have to do if road pricing were introduced.

2.16 Thus far, most members of the public in this country are only engaging with road pricing as an abstract economic concept. It is difficult to try to come to terms with the effects and workings of a scheme that would be so new and innovative. It is likely that attitudes will change further when people are faced with real schemes, and realtime decisions. Public opinion will inevitably change as people gain experience and understanding of road pricing, as evidence from other schemes demonstrates.

2.17 For example, in recent years two free, but congested commuter freeways in California (I-15 in San Diego and SR91 in Orange County) have had 'HOT' lanes added to them. These are separate lanes in which single occupancy vehicles are charged, while high occupancy vehicles can travel for free or at a discount (hence HOT - High Occupancy Toll). The tolls vary according to the traffic levels. The SR91 scheme is described more fully in Annex C. Before introduction only some 45 per cent of commuters approved of charging more for peak periods. Within a few years this had risen to between 60 per cent and 75 per cent. Some people were initially concerned that such tolls would reduce the choices for poorer households, but evidence shows that motorists of all incomes use the lanes. A survey of the users of San Diego I-15 found that the lowest income motorists were more likely to support a fee for single occupancy vehicles than the highest income groups. American motoring organisations originally expressed doubts about the concept, because they feared that the lanes would simply be express lanes for the rich, but they supported it once they had seen what actually happened.

### **Getting used to road pricing**

- Prior to the introduction of the London Congestion Charge, public opinion was equivocal. Findings from a TfL tracker survey demonstrated that after introduction, public opinion shifted in favour of the scheme, with opposition levels falling.
- Findings from various other public opinion polls taken in 2004 indicate that support for the congestion charge has increased further. Additionally, in late 2003, over 2/3 of people agreed that the charge had been successful in reducing congestion.
- In Trondheim, public opinion was initially opposed to the introduction of a road pricing scheme, with 72 per cent against dropping to 48 per cent two months after launch in 1991 and reducing to 36 per cent by 1996.

2.18 In Stockholm, a trial city centre congestion charging zone is due to start in Spring 2005. The city authorities have announced their intention of holding a referendum in September 2006 to decide whether or not it should be permanent. Voters will have had over a year's experience of the scheme in practice rather than in abstract.

## **Conclusion**

2.19 This work is still at a high level. The types of choices that would appeal to different segments of road users, particularly drivers, as well as different sectors of business, needs more development, so that road users can see that real choices are available to them to promote and protect accessibility and maximise the value that we get from our roads.

2.20 So far, too, people are only engaging with national road pricing as an abstract concept - attitudes become more favourable when people experience real schemes.

2.21 The establishment of trust has emerged as a key finding. Chapter 5 explores the institutional issues which might contribute to establishing trust in the way in which a national scheme was run.

## **Chapter 3: Travel today and tomorrow**

3.1 This chapter discusses how we travel today, and how travel patterns are likely to develop.

3.2 It describes:

- the challenge of reconciling the benefits of road transport with its costs
- how, without action, congestion will rise at a faster rate than traffic growth
- the costs of congestion
- how congestion is a reflection of the way we live and travel
- how tackling congestion needs detailed local knowledge and planning
- how current transport interventions, and land-use planning, can help.

### **The challenge - reconciling benefits and costs**

3.3 Motorised road transport has brought us huge benefits. Together with increased wealth and leisure time, it enables us to travel further and with more freedom than in the past. The goods that companies sell and that we buy are delivered with an efficiency that previous generations could only have dreamed about.

3.4 But these benefits come at a cost. As more of us travel, and as we consume more goods, we fill up the roads. The Department for Transport's July 2003 publication 'Managing our Roads' set out detailed statistics. These included a 17 per cent increase in the average distance that people travel to work and a 5 per cent increase in leisure travel (as measured by passenger kilometres) over ten years; a 40 per cent rise in goods vehicle traffic over the last 20 years. As well as economic growth, it noted personal choices and historic land-use policies as major reasons for these changes.

3.5 The challenge is not just one of maintaining personal freedom to travel. We are the world's fourth largest economy. If we are to continue to enjoy rising living standards, we must, in addition, maintain efficient commercial and business traffic. Our society needs to find ways of reconciling the conflicting demands between our needs and desires on the one hand and the costs to which they give rise on the other.

3.6 The costs come in the form of environmental impacts, accidents, congestion and the unreliability which flows from it.

3.7 The transport sector is responsible for one quarter of the UK's total carbon emissions, and four fifths of this - twenty per cent of the UK total - comes from road traffic[2]. Carbon dioxide is the major greenhouse gas which contributes to global warming. Like many other countries, the UK is committed to reducing carbon emissions. But carbon emissions from road transport are growing. The benefits of more efficient modern car engines are being offset by preferences for more powerful cars and increased use of cars, due to higher incomes and falling real motoring costs. High levels of road traffic affect air quality, with consequences for health, particularly in congested and heavily trafficked urban areas. In addition, many neighbourhoods are disrupted by road noise, or otherwise suffer from the intrusion of traffic. Carbon emissions (and the cost per km of fuel for the vehicle user) are higher in congested traffic because engines operate less efficiently. Local air quality can become worse when traffic is slow moving or at a standstill.

3.8 Road traffic is a major source of death and injury - in 2003, 3,508 deaths and 33,707 serious injuries occurred on roads in Great Britain[3]. The relationship between congestion and the level and type of accidents is complex; however, initial evidence from the London Congestion Charge is that there has been a proportionately greater decrease in accidents involving personal injury in the charging zone than elsewhere in London. The Government has a road safety strategy focused on reducing the number of death and injuries on our roads. It recently published a review of road safety strategy[4] .

3.9 Congestion is the major economic cost. The national transport model forecasts that, without further action, the cost of congestion will rise relative to environment and safety costs (from 77 per cent of the total quantifiable costs in 2000 to 88 per cent in 2010)[5]. The volume of traffic on our roads is closely linked also with the wider costs of road transport, such as air quality. The discussion of the causes of and strategies for addressing congestion should therefore be read with the wider effects in mind.

## **Congestion is predicted to rise faster than traffic growth**

3.10 Although forecasts vary, traffic levels will continue to rise as the country's economy grows and the population increases. Previous DfT work suggests that traffic might grow by about a quarter between 2000 and 2010.

3.11 The relationship between traffic and congestion is not linear. Traffic can continue to grow on a road with spare capacity with little impact on traffic speed until the volume of traffic approaches the road's capacity. At that point traffic slows down, and from then on only a few extra vehicles will cause the traffic to slow significantly. In these circumstances, many road users respond by varying the time they travel. Combined with further traffic growth, this leads to an increase in the amount of time during which the road is congested. Tailbacks restrict junctions which would otherwise maintain reasonable flow. The number of roads on which congestion becomes a serious problem grows too, as well as the length of time for which it affects users.

3.12 The converse is that a reduction in congestion can be achieved through a relatively *small* reduction in traffic. The experience of the London Congestion Charge is that a 15 per cent fall in traffic has led to an average 30 per cent reduction in congestion[6].

3.13 There are various means of measuring congestion. The Government has so far done this by comparing the difference in the time it takes a car to undertake a given journey when traffic is free-flowing with the time for when it is congested. This gives an average time lost per vehicle kilometre. Data available so far give aggregate figures, not suited for detailed analysis at the local level. The measure also does not give an idea of the journey experience or reliability. The Government is investigating using various new data sources, for example vehicles equipped with satellite-based positioning systems, to provide a fuller picture of speeds, delay and reliability for individual roads, together with perception surveys to measure the journey experience for the traveller. Some local authorities are also measuring journey times on key routes. This sort of data, which will increasingly become available, will provide a much better understanding of congestion and its development, particularly at the local level.

3.14 Measures introduced following the Government's Ten Year Plan for Transport[7] will have the effect of reducing the rate of *growth* of congestion, but trends indicate that congestion will nevertheless continue to grow into the future and will become an increasingly important issue.

3.15 National projections are not a useful predictor for individual urban areas. Actual levels of congestion will depend on local circumstances. The Government and local authorities are working closely together to improve their understanding of the causes of congestion and to develop demand management schemes.

## **The costs of congestion**

3.16 Congestion frustrates motorists and bus passengers alike. It causes delays and contributes to many journeys taking longer and being less reliable than necessary. Delay and unreliable journey times add to the costs of industry and commerce, whether those of an HGV loaded with produce for a supermarket, or of a service engineer making house calls. There is long established evidence that people value the savings they get from reducing the amount of time spent travelling. And we all hate having to set aside extra time for a journey because we do not know whether congestion is going to cause more or less delay than usual.

3.17 Various estimates of the cost of congestion have been made. A figure of Â£20 billion a year is sometimes quoted, but is of doubtful value. It is based on the value of the difference between actual travel speeds and free flow speeds (although in practice it is not realistic to expect all traffic to flow freely at all times[8]). Forecasts undertaken for this study using the National Transport Model (NTM) (and described more fully in Chapter 4 and Annex B) suggest that a well targeted national road pricing scheme has the potential to achieve as much as Â£10 billion worth of time savings a year (at 2010 traffic levels). This does not include a value for reliability, which could increase this figure by as much as 20 per cent[9] to Â£12 billion. In Central London, TfL report that reliability of buses has improved markedly since the introduction of the charging zone - additional waiting time for passengers due to service irregularity fell by 30 per cent, and disruption to services due to traffic delays fell by 60 per cent.

## **Congestion reflects how we live and travel**

3.18 Most congestion occurs in urban areas and on strategic long-distance routes in the vicinity of urban areas. It is worst during the morning and afternoon peaks. Although congestion is often connected with travel to and from work, other causes include travel to and from school, as well as holiday traffic on certain routes at certain times, and the effects of incidents. In practice, for most of the time and in most of the country congestion is not a serious problem. Indeed, many rural areas are completely free of it. However bad some parts of the network are, the country is not grinding to a halt.

3.19 Land-use patterns have evolved, and are continuing to do so, in response to the widespread ownership of cars, just as these patterns changed in previous eras in response to the development of the railways. Where the railways led to the development of suburbs along rail corridors and clustered around stations, the car has led to widespread estates for housing and the development of work and retail sites on the peripheries of cities, giving patterns of travel to and from work which are not readily served by public transport, and lead to dependence on the car.

3.20 About 70 per cent of people in Great Britain travel to work by car[10]. Car trips are increasing as a proportion of all trips, and there is a slow but steady rise in the rate of single occupancy, particularly for commuting and business purposes. The current average car occupancy rate is 1.6, but it is only 1.2 for commuting and business purposes, compared, for example, with 2.1 for holidays and day trips[11].

3.21 The result is that the overall amount of private vehicle use (measured in vehicle kilometres) is increasing at a faster rate than the amount of travel by people (measured in passenger kilometres).

3.22 Many urban areas are already seeing the peak hours spreading, as drivers travel later or earlier to try to beat the traffic, with main routes and urban centres already at or close to capacity at peak hours. Government statistics[12] show that urban traffic growth is currently faster on minor urban roads than on major ones, and the continuing projected growth in congestion is principally focused in outer rather than inner urban areas. In terms of journey patterns, many cities are predicting high levels of growth in orbital journeys, especially associated with new developments on the fringes of cities. These typically have fewer public transport alternatives than radial routes into city centres.

3.23 Journeys are getting longer. We are increasingly living further from our place of work, partly because we are now less likely to move if we change jobs. The length of commuting trips increased by about 16 per cent in the 1990s, to an average of 8.5 miles in 2002. Over the same period, the average shopping trip length increased by 20 per cent from 3.5 to 4.2 miles.

3.24 Looking at different categories of vehicle, 17 per cent of traffic on major urban roads is freight, and it is growing fast. Over the last ten years freight/HGV traffic has grown by 19 per cent and light van traffic by 39 per cent in response to a 34 per cent growth[13] in the economy. In fact, the single largest area of traffic growth is light van traffic, perhaps reflecting changes in the economy and business practices.

## **Tackling congestion needs detailed local knowledge**

3.25 There will continue to be a case for expanding road capacity where necessary. But it has to be accepted that this will not always be feasible. This is most obviously the case in urban areas, but there are also well known constraints and sensitivities in the countryside, where Government policy has a strong

presumption against schemes that would affect significantly environmentally sensitive sites, or important species, habitats or landscape.

3.26 But, even in such areas, there may be an overriding need to expand road capacity while limiting environmental damage. Road pricing would help in two ways. If a price is high, it acts as a signal for investment - drawing attention to a need. It also provides a potential source of funds for the investment. And in an area where there was general pricing, there could well be a case for a tunnel providing a premium service to those prepared to pay more, on similar lines to the California 'HOT' lanes described in Chapter 2 and Annex C. Tunnels enable traffic to be routed under cities or sensitive natural environments (though they are not without environmental effect), and it is possible to 'scrub' exhaust emissions in tunnels to clean them up before they are released into the wider atmosphere. Tunnels are expensive, but charging has made it possible for them to be constructed in cities in Norway, in Melbourne and, currently under construction, in Versailles in the Paris suburbs.

3.27 We have already pointed out that a small reduction in traffic can produce a relatively large reduction in congestion. So it is important to know how much traffic consists of journeys that could transfer either to another mode, such as public transport, or to a less busy time of day, and how much contains spare capacity which could potentially be available for car-sharing.

3.28 We do not know with certainty how much traffic could switch mode or time at the local level. This is an area that would benefit from further investigation. However, on the basis of data from the National Travel Survey (which has been used in the National Transport Model (NTM) analysis for this study) it is possible to calculate that a substantial amount of the traffic on the roads at such periods could relatively easily switch either to a different mode of travel or to a different time of travel. 36 per cent of people in large urban areas say they would find it easy to change from car (or motorcycle) for commuting purposes. 60 per cent of this traffic in all areas is travelling at peak hours (7-10 am or 4-6 pm), which suggests that some 20 per cent of commuting traffic in peak hours would find it relatively easy to change either mode or time of travel because alternatives to their current travel are capable of fitting in with their lifestyle needs.

3.29 Figure 1 shows the make-up of single occupancy trips. Overall, 71 per cent of cars and vans in the morning peak period in cities have a single occupant, and over half of these (or 38 per cent of all cars and vans) are occupied by a single commuter. This suggests that there is, in principle anyway, considerable spare capacity on congested roads in peak periods in the form of empty passenger seats in cars. Given traffic volumes, a relatively small percentage increase in occupancy would lead to significant reductions in the number of cars on the road.

**Figure 1. Proportion of trips taken by peak/off-peak (Monday-Friday) that are single occupancy by purpose: 2002**

	AM peak (7-10am)	PM peak (4-6pm)	All peak	Off-peak	All times
<b>Trip origin/destination - London/Metropolitan areas/urban areas over 250,000 population</b>					
Commuting	38	32	36	15	23
Business	7	6	6	6	6
Education (incl Escort)	4	1	3	2	2
Shopping	4	6	5	10	8
Other personal	13	10	11	12	12
Leisure	5	9	7	14	11
All purposes	71	65	68	59	62

3.30 These are general figures, calculated on a national basis. It is not easy to relate them directly to potential solutions at the local level. However, they do suggest that the scope for finding a substantial reduction in congestion by a relatively small reduction in traffic certainly exists. There is capacity for car sharing, and capacity for switching mode and/or time of travel.

3.31 The key to tackling congestion is understanding its causes, and from there working out which solutions would be best fitted to offering solutions to the particular conditions of a particular locality - solutions which would be attractive to the people on the road at the time in question. The causes vary from place to place and from time to time. In some places the traffic on a congested road is overwhelmingly commuter-related. In others, a higher proportion will consist of freight, the school run or leisure trips.

## Current interventions can contribute

3.32 Current policies to tackle congestion include measures both to improve supply and to influence demand. Different combinations of measures are appropriate in different circumstances, such as urban areas and large trunk roads or motorways. Supply-side improvements include widening roads and improving junctions, better management of the road network, better bus services and increased use of bus lanes, new light rail schemes, and measures to promote cycling and walking. Other measures being used to influence demand are better travel planning by schools and employers, more information for the traveller, parking policies and promoting coach use. Greater use of tele-working will reduce the number and length of trips made in peak hours.

3.33 Only knowledge and planning at the local, micro, level will inform which measures are appropriate in a given location. For example, there is only real scope for making use of spare capacity in cars if there is a sufficient number of people making a similar commuting journey at the same time for it to be worth their while making the effort to share. Only a local study can inform of this, or of whether there is sufficient mass of travel along a given corridor to justify a new bus route or a park and ride scheme. If a major constituent of a congested road is long-distance freight, it is important to know what amount of it could realistically switch to another route, time or mode.



3.34 In two of the multi-modal studies recently undertaken for the Department for Transport, that for South and West Yorkshire (SWYMMS) and London Orbital (ORBIT), charging for widened motorways was considered as a means of 'locking in' the benefits. It was recognised from earlier work on inter-urban charging that charging on motorways alone could lead to unacceptably high diversions to local roads. The concept developed and tested in both studies was to set the level of charge so that the traffic flows on the motorways after widening were the same as in the base case (without the widening). In both studies, it was found that this condition could be achieved with a charge of 2p/km. Under these circumstances, traffic levels on the local road system would be no higher with the motorway charges than without.

## **Better land-use planning should help**

3.35 Current planning guidance (such as contained in Planning Policy Guidance (PPG 13) Transport[14]) helps local authorities shape the pattern of development and influence the location, scale, density, design and mix of land uses. In this way better planning can help, over time, to reduce the need to travel, reduce the length of journeys and make it safer and easier for people to access jobs, shopping, leisure facilities and services by public transport, walking, and cycling. Consistent application of these planning policies will help to reduce some of the need for car journeys (by reducing the physical separation of key land uses) and enable people to make sustainable transport choices.

3.36 The Planning and Compulsory Purchase Act 2004 enhances the current planning system to involve an integrated approach that seeks to achieve the four aims of sustainable development: sustainable economic development, social inclusion, protection and enhancement of the environment, and prudent use of resources. To ensure that these objectives are met, authorities will be required to subject their local development documents to a sustainability appraisal.

## **These measures are not sufficient on their own**

3.37 Given the range of measures available, why should road pricing be needed at all? In practice, the answer is that on their own these measures appear set only to have a limited and short-lived impact.

3.38 For example, there is a small financial gain if neighbours working at the same location share a car for their journey to and from work rather than travel separately, and of course they lose the convenience of having their own cars. But the impact of one less car on the road at the peak time is too small to have a tangible effect on their travel time. But if, by providing an incentive to make alternatives more attractive, road pricing led more car users to change their method of travel, the improvement in travel time becomes much more significant, and tangibly worthwhile. Similarly, it can tip the balance in persuading someone who has the option to change their time of driving to a less busy time without undue inconvenience, to do so. In other words, the incentive of differential pricing provides a tangible benefit in return for the cost. Less traffic makes bus services quicker and more reliable, and thus more attractive.

3.39 In addition to incentivising the change in behaviour, road pricing can lock in the benefits which have thereby been established. Without the incentive of road pricing, new traffic would soon replace that which has moved off, so that queueing would continue to ration road space at a cost to personal choice and economic wellbeing.

3.40 This is confirmed by research on so-called 'soft factor' interventions (such as workplace and school travel plans, car clubs, tele-working and home shopping) carried out for the DfT by a team from UCL, Transport for Quality of Life, The Robert Gordon University and Ecologica, due to be published at about the same time as this report[15]. This research shows that soft factors have the potential to reduce car use relatively cheaply, but argues that successful implementation depends on a supportive general policy context. Although soft factors have the potential to generate large reductions in traffic around specific sites, supporting demand management measures are needed to lock in these benefits. Without them, the effects of the soft measures on individual choice could be eroded to the level where they have virtually no visible effect on traffic volumes at all.

3.41 A comparison between the impact of road pricing and using existing taxes to discourage traffic is instructive. Motorists as a group currently make a net contribution to general tax revenues. Taxation policy - whether more or less revenue should be raised through one form of tax or another - is a matter for Government and outside our terms of reference. But the efficiency and efficacy of existing taxes for tackling road issues compared with a road pricing scheme is an issue for this study.

3.42 As demonstrated in more detail in the next chapter, road pricing has a much greater impact on congestion than does flat rate fuel duty. This is because by differentiating between times and places, as well as distance, it can target congestion when and where it is happening, rather than overall traffic levels. And it is paying in this better way that makes the impact, rather than the overall level of payment. The current structure of motoring taxation contains a useful mix of incentives, and has merit. But it is capable of improvement.

## Conclusions

3.43 Congestion frustrates motorists and bus passengers and adds to the costs of industry and commerce. A considerable impact can be made on congestion with a relatively small reduction in traffic. In principle the scope for this reduction is traffic exists without serious inconvenience.

3.44 The effects of congestion can be widespread, and affect a wide area and its prosperity. But the source of congestion varies. It is a localised issue, and requires solutions which are sensitive to the locality concerned, its surrounding area, and, crucially, the make-up of the congested traffic. These solutions need to make an offer that those who want to travel in that area will find attractive. Local knowledge is therefore key to developing the right tools for the particular location and for planning the right transport networks. This does not mean that local needs should be given priority over strategic needs, simply that without the local knowledge is not possible accurately to target either.

3.45 Other interventions such as improvements to public transport, car-sharing and park and ride will not realise their full potential without pricing to lock in their benefits.

[2] For further details see Section 2, Chapter 5 of the Energy White Paper, 2003, published by the Department for Trade and Industry.

[3] Statistics bulletin - Road casualties Great Britain 2003, DfT.

[4] Tomorrow's roads - safer for everyone, March 2000, DfT, Scottish Executive, National Assembly for Wales; The first three year review, April 2004, DfT, Scottish Executive, National Assembly for Wales.

[5] See Annex B for explanation of these figures.

[6] Congestion Charging Central London, Impacts Monitoring, Second Annual Report, published by TfL

in 2004.

[7] Northern Ireland has its own 10 year Regional Transportation Strategy (2002-2012).

[8] Indeed, in economic welfare terms the cost of achieving it would be higher than the value that society puts on the time that would be saved.

[9] Provisional results from DfT's analysis of travel time variability indicate that measures which reduce journey times improve reliability by this amount.

[10] Labour Force Survey (LFS) Autumn 2002.

[11] National Travel Survey 2002, published 22 April 2004.

[12] DfT. 2004. Traffic in Great Britain: Quarter 1 2004, DfT.

[13] Department for Transport. 2003. Traffic in Great Britain: Quarterly Bulletin, Issue 1.

[14] Office of the Deputy Prime Minister. 2001. Planning Policy Guidance Note 13 (PPG 13): Transport, ODPM. Similar guidance exists for the devolved administrations.

[15] Cairns, S. et al. 2004. Smarter choices - changing the way we travel, a report for DfT, DfT.

## Chapter 4: How would National road pricing work?

4.1 This chapter discusses how a national road pricing scheme might work and what its impact might be. The Study has examined the subject on a number of fronts. The chapter is structured as follows:

- the technological options
- benefits
- costs
- charging structures
- points to watch
- conclusions.

### Technological options

4.2 There is significant experience, both internationally and in the UK, of all-vehicle and lorry-only road charging schemes. Annex A contains further detail, with examples of how they work. Fuel duty provides a proxy for distance, by charging according to fuel consumed, which is a function of distance (but also of engine efficiency and driving style). But essentially, charging schemes fall into three main types:

- charging for crossing a boundary around an urban area (cordon charging - as found in several towns in Norway)
- charging for driving within an urban area (area charging) - for example, the London Congestion Charge
- charging for the use of a linear section of infrastructure, usually a tunnel, bridge, or section of motorway - for example, M6 Toll, Dartford Bridge, and widespread tolling of motorways in some countries.

4.3 These schemes all use one or more of the following methods of charging:

- toll booths - cash or smartcard
- self declaration - road users use telephone, internet, retail outlets and other mechanisms to volunteer payment to the charging authority

- microwave tags - an electronic device in the windscreen, around the size of a pack of cards, communicates with roadside equipment to register that a vehicle has passed a certain point and that charge is payable via a separate account or credit card
- automatic number plate recognition - cameras take digital photographs of vehicle number plates, which are then read by the system to identify the person liable for the charge.

The last of these (automatic number plate recognition) is not widely used for charging. It is more commonly used as the enforcement mechanism to support one of the other methods (see Annex C).

4.4 These technologies are all well proven. Microwave, in particular, is now in widespread use, for example as an alternative to stopping at a toll plaza on most tolled motorways and bridges. Some versions of it can be used to apply a charge to vehicles travelling at motorway speeds without requiring those vehicles to slow down. Microwave is now being used in some locations (e.g. Toronto and Melbourne) as the sole charging mechanism, with no toll plazas at all.

4.5 All of these schemes can be used to raise revenue. In the case of Dartford, this was the original intention of the scheme, where tolls were used to finance the investment needed to provide the infrastructure. The M6 Toll is a similar example. Revenue raising and demand management are not mutually exclusive, but this Study is primarily interested in how pricing can be used for the latter.

4.6 Cordon and area charging schemes share essential features with motorway bridge and tunnel schemes, and capture the following elements of a journey:

- the fact that travel took place within an area (determined by the vehicle either crossing a boundary - and therefore entering an area - or being detected within the area itself)
- the time that the journey was being made
- the identity of the vehicle making the journey (which is then linked to the owner for charging purposes).

(In the case of cash payment at toll booths, the last of these is of course not needed.)

4.7 These schemes therefore relate to two important journey variables: time and place.

4.8 Although these schemes are on a smaller scale than would be envisaged under a full national scheme for a country such as the UK, they are significant in their own right. The London scheme, for example, has cut congestion within the zone by an average of 30 per cent.

4.9 But cordon and area schemes have two shortcomings:

- they are limited in their scale. They are effective at dealing with city centres, but even a scheme as large as that in London, one of the most significant traffic management schemes in the world, is small in terms of the area it covers in comparison with the size of Greater London. Two cordons, one inside the other, as has been proposed for Edinburgh, can extend their use to a larger urban area. But they cannot deal with large complex urban areas without a large number of boundaries with infrastructure at each one
- they can be blunt. They do not distinguish between short and long journeys, or between vehicles making one or two journeys in a day and those which are on the road for a large part of the day, or even between congested and uncongested parts of the zone. Residents' exemptions and discounts,

which this bluntness can justify, can lead to there being large numbers of vehicles on the road that effectively are not part of the scheme, and are therefore facing different levels of incentive. Once any road user has incurred the charge, pricing plays no further part in influencing travel decisions made for the remainder of that day.

4.10 The key to a better scheme is to add the third variable: distance. A scheme which relates to time, place and distance captures the *amount* of driving taking place, in addition to where and when. This has the following key advantages:

- road users can make choices influenced and informed by pricing signals *throughout* their journeys, rather than just once or twice each day
- short journeys are recognised as such. As are long journeys. Hence, charging relates much more closely to the *use* made of the network and the real contribution that a vehicle makes to congestion and other environmental effects, and, as a result
- much better use is made of road capacity.

4.11 The importance of mixing together time, distance and place is demonstrated by the results from the National Transport Model set out in the Benefits section of this chapter (below). The more precisely congestion can be targeted, the better it can be tackled.

4.12 Current technologies do not lend themselves well to charging by time, distance and place. Microwave technology requires roadside equipment which, in an urban area, would be placed at the entry and exit points of the charged zone. On motorways and similar roads with few junctions, microwave readers would be few and far between. In an urban area, the number of readers required to support distance-based microwave charging would be higher, and could be unacceptable in terms of visual intrusion and cost.

4.13 Hence, national charging based on distance will require location, which in turn means using positioning technology, possibly using satellite systems, although the technology requirement will depend on the precise requirements of the scheme, and on technological developments over time.

## **Reliable and accurate positioning technology**

4.14 Distance-based charging schemes have been developed for lorries in Switzerland and Austria, with Germany and the UK to follow shortly. The Swiss system involves a link to the vehicle's tachograph (which measures distance). Cars do not have an accepted and secure equivalent to a tachograph, making distance-based charging more of a challenge.

4.15 Technologies that can charge by time, place and distance are at the forefront of technological development. While the individual components are available, getting them to work together to the required standard is the challenge. This would entail the development of a complex 'box' on board the vehicle that uses several different technologies (including position-fixing and communications facilities for transferring data to and from the charging authority). No such unit is currently manufactured for the mass market or has the necessary capability to be applicable for all vehicles. There are emerging possibilities of using the technology of the mobile phone cellular radio network that can give the location of a mobile phone, similarly to give the location of a vehicle. But the most likely candidate for a reliable and accurate positioning technology is that offered by positioning satellites.

4.16 There is still a question regarding the reliability, integrity and availability of satellite positioning technologies for use in charging applications. The Department for Transport's DIRECTS project (explained in Annex C) is examining the correlation between the requirement and performance of a charging system and the characteristics and capabilities of satellite positioning systems to satisfy these requirements for urban and inter-urban applications. The level of performance required would be a factor of the charge structure. The more precision that is needed, the more accurate and reliable the positioning technology required.

4.17 Existing in-car navigation and vehicle-tracking systems use American Global Positioning Satellites (GPS) to identify the vehicle's position. GPS satellites provide coverage throughout the UK. The results can be very accurate, but are not always so: signal loss due to high-sided buildings, mountainous terrain or forests must be taken into consideration. For example, existing systems can give a vehicle's position as being in the middle of a building rather than on a road alongside it. This may not matter for normal navigation or tracking needs, where software (often referred to as 'snap to map') can correct this error, by assuming that the vehicle must be on the road. But the assumption may be wrong - the software may correct the vehicle's position to the wrong road. If the charges on the two roads are different, the vehicle may be wrongly charged. Where such error is possible, the legal enforceability of one charge rather than the other could be in doubt. There are potential ways of tackling this, for example by always giving a vehicle the benefit of the doubt where such errors are possible, or by adapting the charging structure. But the accuracy and reliability issue and its relationship with the charging structure is a complex matter, and is one of several areas which will need further work.

4.18 On the basis of expert advice, we estimate that the equipment necessary to deliver a full position-based charging scheme using satellite technology will not be available in a mass market, low cost form, until at least 2014. The launch of the Galileo satellite network[16], which is intended to go into commercial operation from 2008, will be a major step towards this particular solution, providing greater coverage and accuracy, even in the most challenging locations.

4.19 In addition to the development of effective technology, a parallel process of defining standards, especially for vehicles, needs to take place. We believe too that it is likely that the technology needed to implement a national distance-based scheme will need generally to be fitted to vehicles during the manufacturing process, since its complexity and the potential for interference between it and other electronic components, and the need for robustness, would make retrofitment difficult and expensive. This in turn will need a Vehicle Directive from the EU. The UK Government could take a lead in the European Union, which is the appropriate body for these matters, if it wished to ensure that progress towards national road pricing was maintained, without prejudicing the eventual decision as to whether or not to implement it.

## **Benefits**

4.20 In Chapter 3 we described the issues facing the UK's road network: rising congestion, safety and environmental costs which have to be set against the gains we get from road transport. The purpose of this section is to set out the main results from the modelling we have undertaken for this Study, which markedly show how big the potential benefits are, and why a national scheme is so much more worthwhile than limited local ones. At the same time, the modelling has given us some - but only an initial - idea of how the benefits would be spread around the population.

4.21 The modelling methodology and results are set out in more detail in Annex B. It cannot be too strongly emphasised that none of the modelling results should be interpreted as saying what would actually happen if national road pricing were introduced. There is much uncertainty around the results. More confidence can be placed in the relative *outcomes* of the different schemes modelled than in absolute numbers. Considerably more work would be necessary before any robust prices could be put on individual journeys. The modelling does however give sufficient basis for us to be able to conclude that the potential benefits are considerable:

- a national scheme has the potential to reduce urban congestion by around half[17], from a reduction in urban traffic levels of only 3 to 4 per cent, as well as providing significant environmental benefits. There is no economic case for pushing congestion much below this level
- society could potentially benefit by up to Â£10 billion a year, in Great Britain alone, mostly through time savings for road users. This is a gross amount that does not take into account the costs of running the scheme. Neither does it include a value for reliability. Provisional results from DfT's analysis of travel time variability indicate that this could increase the Â£10 billion figure by 20 per cent to Â£12 billion
- road pricing at the levels which achieved the most efficient results would raise more revenue than would otherwise be raised by fuel taxes. But only a little congestion benefit would be lost if prices were set at levels which did not raise more revenue than would otherwise be raised by fuel taxes.

**Figure 2: Proportion of traffic paying each charge**

**Figure 2: Proportion of traffic paying each charge**

4.22 Most of the modelling was undertaken using the Department for Transport's National Transport Model, which covers Great Britain only, looking ahead to 2010. This date for modelling was chosen before the study had reached conclusions on the timing of the availability of technology for national road pricing. But since the purpose is to give a broad indication of the benefits potentially available and to allow comparisons, this is of little consequence. The results are inevitably sensitive to assumptions about the future. For example, the modelling assumes that road users will value their time more highly in the future than they do now. If the value of time remained the same, the benefits would be achieved by prices 40 per cent below those shown. On the other hand, the analysis does not include the benefits of the improved reliability that lower levels of congestion would deliver. If these were included, the value of the benefits shown would be higher. For technical reasons, the charges are all shown in 1998 prices.

4.23 The modelling was undertaken on the basis of marginal social cost pricing. This is explained in Annex A. In practice, it means setting prices which reflect the quantifiable external costs that a vehicle at a given time and place imposes on society, including other users of the road network. In the modelling these costs are congestion (expected to amount to 88 per cent of the total in 2010), some environmental impact (such as air pollution) and safety. So effectively, the higher the congestion, the higher the charge. Figure 2 shows how these charges would pan out across traffic. Charges per kilometre relate to individual segments and thus a trip would incur a number of different charges. A typical drive to work might be cheaper for the first part, becoming more expensive as traffic builds up on the main road into town, finally hitting a higher charge for the last kilometre where demand for limited road space is highest. The charges would also vary according to time. At the peak of the rush hour they would be higher than earlier or later periods, so that a driver faced with road pricing would have a choice between paying the higher rate for a better journey, or a lower rate to travel at a different time. Or he or she may chose to share a car with a

neighbour to reduce the cost, or to transfer to public transport. It is these choices that free up road space and allow the time savings to be realised.

4.24 It can be seen that while the modelling shows prices rising to quite high levels, in practice very little traffic would pay the higher prices, and that over half would pay less than it would incur in fuel duty. It is however worth pausing to note that a driver who chooses to pay the London Congestion Charge (which is £5 a day irrespective of distance driven in the charging zone) but travels only 2 km to and from work in the charging zone, is today paying £1.25 per km, compared to the highest figure of 80p assumed in this modelling, which would only be paid by 0.5 per cent of traffic. The prices could be capped at lower levels with little impact on overall congestion, as Figure 3 shows.

### **Figure 3: Impact on traffic and congestion relative to the Ten Year Plan**

#### **Figure 3: Impact on traffic and congestion relative to the Ten Year Plan**

4.25 The first row of Figure 3 represents charging at full marginal social costs, whereby a very small amount of traffic would pay high costs. Rows 2 to 9 show that by capping the highest rate at 80p per kilometre or less, considerable benefits are still achieved. There is no significant loss with caps down to 50p, but the benefits then begin to fall. The first row of Figure 3 represents charging at full marginal social costs, whereby a very small amount of traffic would pay high costs. Rows 2 to 9 show that by capping the highest rate at 80p per kilometre or less, considerable benefits are still achieved. There is no significant loss with caps down to 50p, but the benefits then begin to fall away. Again, it should be noted that little traffic would be paying the higher levels, and for most people they would represent only a part of any journey to which they applied. Row 3 models a 'revenue neutral' version of row 2, in which fuel duty has been reduced to offset the charges. The very similar congestion benefits between the two demonstrate that it is the price differentiation that has the impact on congestion. The importance of price differentiation is reinforced by row 4, which was modelled to provide a comparison between the effects on congestion of road pricing and of raising fuel taxes. It shows that raising fuel duty to provide the same additional income as marginal social cost pricing has a much smaller impact on congestion - reducing it by only 7 per cent rather than by a half - because it is blunt in its effect on congestion, rather than targeting it directly.

4.26 Figure 3 also shows that urban roads would be priced at a higher rate than rural ones, because it is in urban areas that congestion is worst. In both cases, the reduction in congestion is much higher than the reduction in traffic. Rows 10 and 11 show the effects of only charging in urban areas. They again reflect that it is in urban areas that the problems are concentrated - and even more so in London and the conurbations. The Study commissioned some modelling of cordons in urban areas from certain regional multi-modal models (see Annex B for details). This showed that while cordons can produce worthwhile benefits, the options tested produced significantly lower benefits than those available from charging which more precisely targets time, place and distance.

## **Benefits for social inclusion**

4.27 As discussed in more detail in Annex G, a carefully structured road pricing scheme could provide positive benefits for groups that suffer from social exclusion or limited accessibility. It could potentially:



- reduce the costs of finding and travelling to jobs, and to educational and health institutions
- encourage a vibrant car sharing market
- provide further revenue support for bus (or taxi) services without making them liable for charges
- make bus journeys more frequent and reliable
- provide a wider set of travel choices to all individuals, regardless of circumstance
- reduce the effects of traffic on communities
- increase the number of people using public transport, so sustaining services and also helping to address fears for personal safety on under-used services.

4.28 We have not been able to model the overall effects of road pricing on poorer and better-off households. These would depend on local circumstances and the availability of alternatives to driving a private car in peak periods. One would generally expect those who value their time highest to benefit most from choosing to pay to drive at their preferred time. Distance-based charging using the LASER multi-modal model for London and the surrounding area showed that, on average, the better-off would experience much larger absolute commuting cost increases than would the poorer groups, because of their greater trip lengths and greater proportional use of the car.

## **Benefits for the environment**

4.29 A carefully structured road pricing scheme could make a valuable contribution to reducing the environmental impacts of roads and traffic. It would help to reduce greenhouse gas emissions in line with UK and international climate change targets. Its ability to target time and place precisely means that it would contribute to further improvements in air quality, particularly in times and places when it is particularly bad. The NTM modelling forecasts reductions of some 7 per cent in NO<sub>x</sub> and PM<sub>10</sub>. Reductions in traffic and congestion would also secure reductions in noise, community severance and other nuisances. The better use of the network that would result from pricing would minimise the impact of and need for new road infrastructure.

4.30 The impact on carbon is not entirely clear-cut. While vehicles emit less carbon when they are running in smooth conditions than in congestion, in pricing terms it is the overall level of the cost of driving which affects carbon emissions rather than the differentiation in price according to time and place that road pricing makes possible.

## **What do the congestion benefits actually mean for people?**

4.31 Less congestion will mean that most people will be able to drive to their destination at the time of their choice in less time than now. And their journeys will be more reliable and less polluting. Bus passengers are also likely to benefit from less congested roads, as they have in the central London congestion charging zone (c.f. Chapter 3). It is these savings that make up the bulk of the benefits quoted in paragraph 4.21 above. Some people - and our understanding of who these road users are is limited - will decide against paying the charge for the trip and time of day in question. A measure of the inconvenience of changing their behaviour has been estimated, using well established methods, and deducted from the time savings delivered by charging to estimate the social benefits set out in Annex B. The benefits are positive, with time savings for road users, and potentially a large sum of money available in revenues to be distributed.

4.32 The disaggregation reported in Annex B is very much the direct - or first order-effect. In other words, it ignores who gains from the revenues raised (which is discussed below). Inevitably, there are bigger welfare gains for those who most value the time saving that road pricing brings. Business traffic gains particularly from improvements in journey time and freight gains from reliability. There would be changes to patterns of shopping and leisure activities, but a well planned scheme should lead to more sustainable land-use patterns, which would be beneficial in the long term. It would be misleading simply to interpret a loss of welfare for a particular group as meaning that that group are losers. There is a loss of welfare if a driver is no longer able to exercise his or her first choice to take his or her car to work with no passengers rather than share. But this is increasingly going to become as unrealistic an option for many more people as it already is for the many people across society who depend on public transport to get to work in London. Are people who gain a quicker journey to work at the cost of sharing cars or using better public transport really losers?

4.33 More work is needed on how road pricing would impact on the regions, on business and on different segments of road users. But the real issue is that without road pricing we all lose - by higher and higher amounts as the years go by and congestion grows.

## **Use of revenues**

4.34 The National Transport Model forecasts revenue in 2010 from a marginal social cost national pricing scheme of some £9 billion a year (at 1998 prices). This is a gross sum

- it has not had the costs of running a charging scheme or compliance costs deducted from it. Nor does it take account of any offsetting reductions in road taxes. But there are various ways in which the revenues could be used. They have their pros and cons, and it is very much a matter of political judgement how to divide up this particular cake.

4.35 One option is to return the revenue to road users. This would demonstrate that what matters is not gaining additional revenue, but the smarter way of paying to use the roads. If done on a national basis by a simple compensatory reduction in fuel duty (which is how this option has been modelled in the National Transport Model analysis), this would result in a transfer of resources from drivers in congested conditions (largely London, the South East and the conurbations) to those who do not drive in congested conditions (the countryside, in particular the remoter areas).

It is possible to conceive of more sophisticated means of maintaining such revenue neutrality, which would do it on a regional or more local basis, or in ways which could help out those road users who could not avoid, but could least afford, to pay the higher charge levels.

4.36 Among the options for offsetting tax reductions could be changes to Vehicle Excise Duty. The technology needed for a national system of road charging, along with possible developments in vehicle-related databases and in the way motorists relate to Government by, for example, licensing their vehicles on line, could result in the longer term in fundamental changes to the way in which VED is calculated and collected. This could mean that graduations in VED - possibly reflecting use of certain categories of road or location of keeper - could continue to play a role in the mix of tax and charges under a national charging scheme.

4.37 It has not been possible within the timeframe of this Study to develop all of these propositions in detail, which will be an important element in the work needed to develop a detailed national scheme. Also important will be tests of their robustness and modelling of their impacts, particularly on individual motorists, on the regions and on the balance between England, Scotland, Wales and Northern Ireland, and consideration of the respective powers of the UK Government and the devolved administrations.

4.38 Rather than be returned to motorists, the additional revenue would have additional environmental benefits and could contribute to funding transport, either to help with public transport alternatives to the car, setting up car-share or park-and-ride schemes or to build additional road capacity, including making more expensive, but environmentally friendlier, options like tunnels more economic. These options, will also need further work.

4.39 Or the revenue could be used in other ways - to reduce local taxes, or as a source of revenue for additional spending on other public services, perhaps reducing the need to travel or funding regeneration schemes, at the local or regional level. Such uses could help to mitigate any negative local effects from an otherwise worthwhile pricing scheme.

## Costs

4.40 Any road pricing system needs to incorporate more than charging technology. It needs an enforcement mechanism; and it needs systems to process charges and payments and handle enquiries. Annex G considers enforcement issues, and as noted in Chapter 5 and Annex I, the Department for Transport have developed a model for how such a system might be run which respects privacy.

4.41 There is no doubt that it costs a considerable amount of money to introduce any type of road charging scheme. We know, for instance, from the experience of London, that daily licence schemes using ANPR cameras for enforcement have affordable set-up costs, although this sort of technology has significant processing overheads and corresponding back-office costs.

4.42 It is not possible to predict with any certainty what a national scheme using positioning technology would cost in the middle of the next decade. This sort of system has never been tried before and, without detailed design and testing, it is not possible to specify accurately what would be required. Moreover, technology is developing, and by the time this sort of scheme could be introduced, it would probably have fallen considerably in price. Our best guesses produce very large numbers (though still lower than the potential value of the benefits) which reflect these uncertainties. What we do know is that any scheme that involved using sophisticated technology to charge 30 million vehicles on a per kilometre basis is going to involve significant costs, in establishment, in technology, and in operation.

4.43 Potentially the biggest cost involved in setting up such a scheme is the cost of getting the on-board technology needed into vehicles. This sort of technology is still relatively new and very few vehicles are equipped with it. By way of example, if the necessary units were to cost £100, buying 30 million of them would cost £3 billion. There would be further costs, including enforcement, and the systems needed to administer the scheme on an ongoing basis. Current estimates of annual running costs range between £2 billion and £3 billion (rising to some £5 billion if optimism bias is added).

4.44 These costs will need to be paid for, but need to be considered in context. In Great Britain, we spend over Â£1 billion per week <sup>18</sup> - some Â£60 billion a year - on private motoring alone. The potential costs of setting up and running road pricing need to be considered alongside the high levels of benefits predicted on an ongoing basis.

4.45 Position-fixing technology is becoming more common. Many companies have started to use it to track their vehicles' movements; some vehicles now have anti-theft devices that involve position-fixing technology; and some insurance companies are experimenting with it as a way of introducing pay-as-you-go premiums. Although only a small proportion of the vehicle fleet is affected by these initiatives, we expect this proportion to grow markedly in the next few years. CD players were once a luxury item found only in a few, top-end, vehicles but are now almost standard equipment across the range. In much the same way, we consider that position-fixing technology is increasingly likely to be fitted as standard to a wider range of vehicles.

4.46 Of course, it is unlikely that, left to itself, the market is going to put devices into vehicles that would necessarily provide the full functionality to support road pricing. For road pricing the devices would have to meet a particular specification, not least to ensure that they were secure and robust against fraud. To ensure that the market does develop in the right direction, the Government will need to work closely with the manufacturing industry to develop common standards, and with European partners to develop the necessary regulatory framework at international level. This process has already begun - the European Union adopted an Interoperability Directive earlier this year, which provides a framework for setting standards for satellite-based schemes - but much more work would be needed.

4.47 The Government will need to consider the extent to which synergies and efficiencies with existing vehicle and driver services could work to reduce the add-on costs of introducing road charging schemes. Registering drivers for any scheme, processing records of vehicle movements into charges, and issuing these charges as bills to drivers would require a significant back-office operation and, given the numbers of vehicles, significant cost. However, it might be possible to run these sorts of operations in conjunction with existing services, such as those provided by the DVLA.

4.48 Another important cost would be for enforcement of road charges. At present, any road pricing scheme would have to rely on a network of cameras to detect vehicles which were evading the charge. These cameras are expensive to install and operate. The EU has commissioned a study of Electronic Vehicle Identification (EVI). This involves installing a device in vehicles that can be interrogated to give a unique vehicle identifier. It might, in future, be possible to use EVI rather than cameras as the basis for enforcing a road charging scheme, which would reduce the costs of enforcement.

4.49 In short, a national road charging scheme using satellite or similar positioning technology is very difficult to cost accurately today. The challenge for Government is to work with component manufacturers, the automobile industry, and European partners to get the right technology in vehicles, and exploit the potential synergies with existing areas of government activity, to improve affordability.

## **Charging structures**

4.50 The benefits discussed above are forecast to arise from a pricing structure targeting the costs of journeys according to time, distance and place. We need to consider how this would work, who sets the prices, and what the prices comprise.

4.51 Such a pricing system needs a base, or platform, of a new form of distance charge. On its own, a simple distance charge would not deliver the benefits sought (and it might not prove value for money). The key is the ability to vary the distance charge by time and place.

4.52 Current motoring taxation, as noted above, includes an approximation to a distance charge, in the form of fuel duty. Fuel duty is set by central Government (a minimum level is provided by the Energy Products Directive[19]). It is cheap to collect, and serves a number of purposes, including an incentive to fuel efficiency and hence saving carbon emissions. But in itself it is not a good platform for variations by time and place, because (as explained in more detail in Annex A) its link with distance is approximate and because it does not provide a means of identifying a vehicle's location in time and place, which is needed for varying the charge according to these parameters.

4.53 A true national road pricing system therefore needs a new national mechanism which has the capability to charge by distance and for the level of that charge to be varied, up or down, to reflect conditions of time and place. It would be sensible for the variations to develop over time, to ease the inevitable transition and to reflect changing conditions.

4.54 Setting different prices will not be easy. Whilst some might argue that the Government should determine all charges, congestion usually has localised causes, and tackling it needs local knowledge. The same is true, with the exception of carbon emissions, of the environmental effects, particularly air quality. Prices would need to reflect local circumstances. If set too low, they would not have a worthwhile impact. If set too high, their overall effect would be negative rather than beneficial. Hence, if the Government led with the introduction of a national distance charge as the core component of the price structure, it would then need to work with local authorities and other stakeholders to agree the calibration of variations, and establish where and when they should apply. It is this which would provide benefits at the local level, which in turn add up to significant national benefits.

4.55 Under a national road pricing scheme established on this basis, prices on the strategic road network would need to be set (by the Government or the devolved administrations, as appropriate) according to the same principles as local roads, taking account of local conditions. In rural areas, price levels would need to avoid giving through traffic an incentive to divert to less suitable local roads. In congested areas, price levels would need to avoid attracting local traffic seeking to dodge higher charges on the local roads. In other words, prices on the strategic network would need to balance the requirements of through traffic with the conditions of the locality through which the road was passing.

4.56 A moot point is whether this form of pricing would need to be applied across the whole country, in particular in the more remote areas where traffic is light. It may well turn out that sufficient benefits could be obtained by only applying this new form of charging in the more heavily populated parts of the country. But it is difficult to see how a restructuring of national taxes could take place in such circumstances. Either there is a national distance charge collected electronically and varied to reflect time and place, or there is a rough distance-related charge such as fuel duty, augmented by local congestion charging schemes. If the latter, then vehicles would in any case still need to be fitted with some form of on-board equipment. If charging were to be undertaken according to distance, time and place rather than by cordons, that equipment would need to be in the form that would achieve that. The most likely candidate for such equipment, one that uses satellite positioning, would be better factory-fitted than retrofitted. In addition, if local congestion charging spread to all significant urban centres, then the majority of vehicles would operate in charged areas fairly frequently. So the argument comes back round

to favouring a new national system such as is described here, rather than one based on fuel duty and local congestion charging.

4.57 There is bound to be a transitional period, during which not all older vehicles are equipped with the necessary kit, or during which the new charging regime is being rolled out in stages. In either of these circumstances, special arrangements would be needed. These would need to be worked out in due course, but could, for instance, be based on the concept of a licence as an alternative to the on-board kit to allow unequipped vehicles to drive in the area subject to charging.

4.58 A major decision would be whether the national charging system should replace fuel duty in whole or only in part. The former would require a change to existing European law. It would not be possible to abolish it completely unless or until the whole country was subject to distance charging. Either way, to help retain some of the incentives which higher levels of fuel duty provide, notably in respect of emissions, consideration should be given to graduating the charge by vehicle type and other measures which might encourage the purchase of more efficient vehicles.

4.59 In developing price structures, it is important to consider the different needs and lifestyles of road users, as noted in Chapter 2. Rather than offering road users one set of prices, it would be possible to develop pricing packages which reflect the ways in which different road user groups might wish to use the roads. Road users would then be able to select the package which best suited their travel needs, in much the same way that mobile phone customers can choose between tariff packages with different elements. It will be important of course to ensure that packaging retains the ability to deliver the benefits that road pricing can bring. That is, the price signal must remain sufficiently clear to the driver to have the right effect.

## **Points to watch**

4.60 We need to be cautious about our modelling results. However good a model is, there is no substitute for real information from real systems. Unfortunately, there are no systems comparable to the one we have modelled for the whole of the UK in operation anywhere in the world.

4.61 The scheme we have modelled is a proxy for the type of scheme which might be developed for implementation. It is there to facilitate study of the possibilities attached to road pricing. As noted above, it is critical both to get the prices right, and to set the scheme in the right environment, in terms of complementary measures, for it to be a success.

4.62 It is especially important to watch the distributional effects of pricing. A preliminary examination of the issues is in Annex B. Much depends on how much the scheme costs to run and what use is made of the revenues. Even if overall motorists don't pay more, some journeys will cost more, while others will cost less. The balance of these costs is very important.

4.63 Charge calibration, local knowledge, and other elements of the transport network are key. That points to key roles for local bodies charged with planning transport in their areas, in setting charge structures and the complementary measures which surround them. There is also a key interrelationship between road pricing and land-use planning.

4.64 Central Government will need to consider how to ensure that sufficient variations to the charge are established to deliver the benefits road users need, and could go as far as requiring proposals from local authorities within the local transport planning process.

4.65 The institutional structure used to operate the system and to regulate (or otherwise control) the charges will need to gain and retain the trust of road users. It will need to demonstrate transparent treatment of what use is made of the money that road users pay. Depending on the eventual policy decision to be taken on the use of revenues, it is likely that some will be a tax that goes to the Exchequer. Some may be a charge for a service, such as new road infrastructure. Some may flow direct to local authorities or devolved administrations. Some may flow back to road users, either through reductions in motoring taxes or, in ways that the Study was not able to explore in the time available, in the form of credits for driving at uncongested times or in the context of different pricing packages for different types of road users. This will not be a simple task. Clear objectives and criteria would need to be established for setting charge levels, and some on the Steering Group believed that a more fundamental reform of motoring taxation would be required.

4.66 International experience cannot tell us how to devise a national pricing scheme targeting time, distance and place. But we can learn the following lessons:

- road users are not all the same. Price structure development requires detailed segmentation of the market into user groups to understand people's needs, lifestyles and travel patterns, and a clear understanding of how the transport network operates in the proposed charge area (similar principles apply in the commercial world, in addition to the transport sector)
- it is important to build experience and consensus. Getting the details of a scheme right is crucial to its success. If that is true for individual schemes, it will be more so for a national scheme. Equally, the success of individual local schemes is dependent on a sufficient degree of consensus supporting their adoption, and again, if this is true for individual schemes, it will be more so at the national level
- it is difficult to forecast precisely what will be the effects of a scheme
- in addition, we have learned that the long term effects of pricing schemes, for example, on land-use, are very difficult to predict.

4.67 Given the need not only to get the charge structure right, but to establish the capability to undertake the charging, processing and enforcement elements of the system, a national road pricing scheme would be a major delivery challenge. Costs are difficult to estimate for a national scheme. It is certainly not the stuff of big bangs, and a transitional phase is inevitable.

4.68 But the results we have seen indicate that there are enormous benefits available through road pricing for private users and businesses alike.

## **Conclusions**

4.69 A national road pricing scheme would consist of a distance charge set by Government, with variations by time and place, to reflect traffic conditions and their effects, designed and agreed with local authorities and other competent tiers of government, in consultation with wider interests. While not an answer to all of the issues we face on our roads, it could deliver very significant benefits in terms of congestion reduction and environmental benefits. To do this it will need to address the costs of journeys with a good level of precision, focusing on time, distance and place.

4.70 The technologies that would deliver the highest benefits are still in development, but likely to become increasingly available and affordable over time. Introducing a national road pricing system would be a complex delivery challenge. In the meantime, this should not stop proposals for local congestion charging schemes using available technologies going ahead.

4.71 Getting the price right, together with complementary local measures and the use of revenues, is critical to maximising the benefits for society. This can only be done properly by careful examination of the issues and needs at a local level. Using too simple a range of prices, or imposing a nationally set price, does not give the flexibility to deal with all local conditions. And the use of revenues opens up a number of options. There will be difficult decisions to take on how all these matters are dealt with in practice.

4.72 Clearly, therefore, there is a good deal of work to be done, not just on the technology, but on getting the structure and prices right for road users, before any scheme could be introduced. But this does not preclude the conclusion that pricing can improve conditions for road users in ways that other measures cannot easily achieve. By signalling to users the costs of travel, people will decide that for some of their journeys they will change the way in which they make these trips. They make these changes if they are at relatively little inconvenience to themselves. If the inconvenience were greater, they would not make the change. The majority of trips are less flexible or less easily changed. All of these trips will benefit from quicker, more reliable and less stressful travelling conditions. The analysis of road pricing described in this report shows that net time savings and reliability related benefits of up to Â£12 billion a year could be delivered by a national scheme, and that local schemes could also deliver worthwhile benefits.

[16] The Galileo positioning system is a planned satellite navigation system, intended as a European complement to GPS.

[17] Higher reductions in congestion are likely to cost more than the value of the time saved.

[18] Focus on Personal Travel, published by DTLR in December 2001.

[19] Council Directive 2003/96/EC of 27 October 2003 restructuring the Community framework for the taxation of energy products and electricity.

## **Chapter 5: Implementation - Institutional issues**

5.1 This chapter considers the relationship between central Government, devolved administrations and local government in implementing the charging strategy described in Chapter 4. It covers:

- key decisions in establishing a pricing scheme
- current institutional roles
- what has happened so far in terms of establishing pricing in the UK
- what central and local government can do and how they can work together
- conclusions.

### **Key decisions in establishing a pricing scheme**

5.2 Delivering a road charging scheme is going to require, at a minimum, the following decisions:



- determining what type of road charging scheme is appropriate (e.g., area-based, distance-based, cordon or segment)
- determining what is the purpose of a charging scheme, and protocols for how revenues are to be used
- depending on that decision, deciding where cordons or boundaries are located, which segments are charged etc.
- determining whether there should be any exemptions from a scheme, and whether there should be discounts for certain groups
- determining whether on-board equipment should be mandatory, or what scope there should be for an occasional user scheme
- calculating the charges
- specifying, procuring, installing, testing and servicing the required roadside equipment, in particular, managing the planning process
- specifying, procuring, installing, testing and servicing any equipment fitted to vehicles
- designing, procuring and regulating a back-office to turn data on vehicle movements into charges, to link those charges to road users and to bill them
- establishing and operating mechanisms to ensure that motorists can easily comply with the requirements of the charge, and to manage entitlement to exemptions and discounts
- establishing and operating mechanisms to enforce the scheme on motorists who evade or refuse to pay.

5.3 It will, more generally, require clarity as to the objectives of the scheme, ease of operation and a clear understanding by the public of how it works. Transparency and trust will be vitally important elements in the successful delivery of any charging scheme.

5.4 As described in Chapter 4, the development of a structure of road charging will involve decisions across the whole of Government. There would be a clear need for central Government to set frameworks, in particular insofar as a distance charge might replace other motoring taxation, and to ensure that the statutory framework was in place to enable a charging regime to operate.

5.5 There may also be a role for central Government as a facilitator, providing expertise and possibly services which will both enable the sharing of risk and promote interoperability and ease of operation. It will also need to ensure that there is a consistent approach to enforcement.

5.6 However, the implementation of a charging scheme will take place against a background of institutional powers and constraints. Legislation, respective powers and practice at European, national, devolved administration, regional and local level will both influence and be influenced by a charging scheme. It is important to note that congestion, travel-to-work areas, and, as a consequence, charging schemes will not necessarily fit neatly within administrative boundaries.

## **Current institutional roles**

5.7 At **European** level, the key legislation is the Directive on Interoperability of Charging Systems (2004/52/EU), which was published in the Official Journal on 30 April 2004.

5.8 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 (OBU) to access all charging schemes within the EU. The Directive established a technical committee, convened by the Commission, charged with developing detailed proposals by 1 July 2006, with those proposals being implemented by 2009 for goods vehicles and 2011 for cars. The Directive will therefore set a framework for the management of charging schemes across Europe. The Directive applies to all electronic charging schemes and all charging schemes that are not strictly local in nature.

5.9 In the UK, **central Government** has laid down a legislative framework to allow local transport authorities to undertake charging (with separate but equivalent legislation covering London). This legislation is described in more detail in Annex H, but the principal items of legislation are:

- the Greater London Authority Act 1999
- the Transport Act 2000
- the Transport (Scotland) Act 2001.

There is no equivalent legislation for Northern Ireland.

5.10 In outline this legislation permits local authorities to undertake charging in furtherance of the objectives of their local transport plans, with the revenues from charging hypothecated to local transport improvements for at least the first ten years[20] of a charging scheme, provided that schemes are initiated within ten years of the 2000 Act (although the Act does provide for this ten year deadline to be varied by regulation). All such schemes must be approved by the Secretary of State (or equivalent in the devolved administrations).

5.11 Central Government is also responsible for legislation on privacy and data protection, although the principal legislation - the Human Rights Act 2000 and the Data Protection Act 1998 - implement European law. This legislation and its implication for charging are discussed in Annex G.

5.12 The **devolved administrations** are responsible for the administration of roads. Under the current administrative framework there is separate legislation for Scotland (the Transport (Scotland) Act 2001) and the Roads (NI) Order 1993 governs the administration of roads in Northern Ireland, while the Transport Act 2000 applies to England and Wales.

5.13 The consequences of this division of responsibilities are:

- in Great Britain the powers to initiate charging schemes lie entirely with local authorities, with the role of the Secretary of State being essentially quasi-judicial in approving charging schemes[21]
- the framework describing the purpose of charging, and the application of revenues, is set out in the primary legislation and acts as a clear constraint on local authority initiatives
- all operational decisions and functions rest with local authorities
- the current structure contains no obligation to adopt a common approach or methodology for modelling charging schemes or for assessing costs and benefits
- there are no general powers to allow the Secretary of State (or the appropriate devolved administrations) to charge on the strategic road network, although separate and free-standing powers do exist to charge where the network uses bridges or tunnels. Any charging strategy that involved the

strategic road network would therefore require powers to be granted in primary legislation.

5.14 Central Government is establishing common standards for charging schemes. The main thrust of the Government's work to date has been the development of a business model for a range of interoperable road charging schemes. This work is ongoing. When complete it will comprise a set of technical specifications, a set of performance standards and a framework for business architecture:

- establishing *common technical standards* - the business model will describe a set of common technical specifications to ensure technical interoperability, in particular to meet the terms of the Interoperability Directive. These specifications are being tested in the DIRECTS[22] trial which is due to start shortly in Leeds
- *developing a UK business model* - the business model will describe the sorts of organisational entities and relationships necessary to ensure interoperability between different local schemes, while ensuring competition, user privacy, and system robustness. As part of the feasibility study the Department for Transport asked Deloitte Consulting to test the emerging model against a variety of different illustrative scenarios. They have found that, while needing some refinements, it would provide a framework in which different local authorities could develop local congestion charging schemes independently, but in a compatible and efficient way.

5.15 The current legislation implies that, should the Secretary of State[23] decide to take a more proactive role in acting as an advocate or provider for schemes, there is a potential for conflict with his role as a quasi-judicial arbiter for schemes. The relationship between the Secretary of State and local schemes would need to be a key focus of any future legislation which sought to formalise partnerships between central and local government in developing charging schemes. Further detailed work will be needed to develop a system of scrutiny and approval that is transparent and fair.

## **What has happened so far**

5.16 So far, only two urban charging schemes have been established in the UK; the London Congestion Charge and the very limited city centre scheme in Durham. Neither of these requires any on-board equipment on the vehicle. Local authorities have faced a range of concerns, both political, in terms of whether charging schemes would be locally acceptable (with fears that pricing would disadvantage the town relative to its neighbours) and administrative, relating to the risks in financing and delivering workable schemes. Of these factors, the political concerns appear by far the greater, with local authorities outside London regarding the capital's scheme as a special case. In particular, the outcome in London has been influenced by the very clear political leadership that has driven the project through to delivery.

5.17 There is no reason why the most effective or efficient charging arrangements to reduce congestion would be congruent with local authority boundaries. Schemes would need to reflect matters like local transport and demographic patterns. Rational charging schemes would require co-operation between neighbouring authorities, and would need to take account of regional transport concerns.

5.18 This clearly points to an important role for central Government as an advocate for charging where and when appropriate, and to work to reduce the risk for local government as far as possible. But the importance of local factors implies that it will be necessary for central and local government to work in partnership as we noted in particular in discussing charge structures in Chapter 4. Such partnerships will be essential in generating the wider public consensus that will be necessary as the basis for road pricing to

be introduced.

## **Requirements for a national charging scheme**

5.19 Looking to the future, there are a number of roles that central Government might fulfil. These range from acting as an advocate for charging, through providing a legislative and wider framework, to a practical delivery role.

5.20 A comprehensive national charging scheme would clearly need primary legislation. Powers to charge on the strategic road network would be required. The legislation would also need to cover the functions described in paragraph 5.2 above and deal with how revenues are handled. It seems inevitable that any powers to vary charges will need to be constrained by national legislation, especially in a structure where local powers to vary a charge could have a direct bearing on other revenue and taxation issues. The legislation will need to be consistent with existing law on privacy and data protection.

5.21 Legislation will also need to set out a framework for enforcement. The nature of enforcement will partly depend on decisions about how revenue from charging is classified and used, but considerations of equity and transparency mean that there must be a national framework of enforcement legislation and consistency of practice, in particular relating to the allocation of penalty income where a national scheme is subject to local variation. Enforcement issues are discussed in detail in Annex G. The most appropriate framework for enforcement would appear to be a system of penalty charge notices, enforceable in the civil courts, similar to that used for parking and by Transport for London in enforcing the London Congestion Charge, with criminal sanction only available as a last resort. But, as Annex G describes, there may at some future point be links between a national charging scheme and the national vehicle record.

5.22 Where charges can be varied locally, there are questions about how far revenue should be divided between local and national schemes, how specific any legislative guidelines should be, and the way in which both national and local accountability should be managed.

5.23 There will also need to be a clear link with those Government agencies that are already dealing with the motoring public. There are clear benefits from integrating charging mechanisms as far as possible with initiatives being developed by the Government to ensure easy access to processes such as licensing, and to ensure that the charge is easy to understand and pay. These themes are explored in greater detail in Annex G to this report.

5.24 As outlined above, the Government is developing a business model for local charging schemes. This model is set out at Annex I of this report. As part of this study, consideration has been given to whether the model - which has been developed in the context of the current legislative framework - could form the basis of a national scheme. A report prepared for the study by Deloitte has concluded that, with adaptations, it could form the basis of a national model that would meet the general objectives of ensuring interoperability and protect the privacy of charge-payers. The adoption of such a model would ensure interoperability and would greatly enhance the transparency and public acceptability of the charge.

## **A framework for central and local government to work together**

5.25 A system in which local authorities had powers to vary national charges would clearly need a legislative framework to govern the relationship between the two, to ensure proper accountability and to ensure that the objectives of each can be realised in an agreed way.

5.26 If the trust of road users is to be achieved and retained, there will need to be a framework which can provide a transparent form of regulation, perhaps by the establishment of a new institution, of both the level of the charges set and the use to which the revenues were put.

5.27 In developing locally-based schemes to pave the way for a national scheme, there is a clear need for the central Government to have powers to initiate work by local authorities, while recognising local needs, and to ensure that local transport objectives are not hampered.

5.28 Central Government is likely to have a key role in establishing a framework for privacy, to ensure that business architecture provides the protection that the law requires. This is discussed in greater detail in Annex G to this report. However, in principle there is no reason why it should not be possible to create structures that will protect privacy and ensure security of data to meet legal obligations. A statutory code for data handling could play an important role in ensuring public trust in charging schemes.

5.29 At the more practical level, there are several ways in which central Government could act to reduce costs and risks and to ensure consistency of approach. It could provide modelling expertise and methodological guidelines to ensure that decisions in different localities were taken on a consistent and transparent basis. It could also act as a provider of key services, such as back office capacity - as described in Annex I - which could ensure that local charging schemes were cost-effective and that risk was well managed.

## **What local government can do**

5.30 Responsibility for local development and local transport clearly remain with local government (except in Northern Ireland)[24]. As mentioned earlier, local government generally has the role of developing local transport strategies, including those that impact on congestion such as development policies and the setting-up of local workplace parking levies. Charging is therefore likely to be one element in a mix of local policies to improve transport. Many of the direct effects of a charging scheme will be felt locally.

5.31 As mentioned earlier, it would be both inappropriate and impractical for central Government to take detailed decisions about how schemes should operate. Local government will be a key partner, developing and agreeing with central Government local variations to the distance charge, to complement the local transport plan. It is likely also to have a role in ensuring accountability, as well as the micro-management of schemes.

## Conclusions

5.32 The issues discussed above lead to the conclusion that to deliver an effective system of road charging, one that delivers real benefits and enjoys political consensus, there needs to be a new model of partnership working across the tiers of government. In outline that partnership could comprise:

- a central Government designed and operated distance charge; based on systems fitted in all cars, following international negotiation of standards; with a common back-office; and consequential reductions in other current motoring taxes
- with the option, where it makes sense, for that distance charge to be varied - up and down - to reflect congested and uncongested conditions
- Government would need to work with local authorities and other stakeholders to agree the calibration of variations, and establish where and when they should apply
- detailed understanding of the local motoring market and the local travel context, including the acceptability of the alternative arrangements in place for those encouraged out of their cars, would need to be developed - possibly scope for central Government to help in developing standard approaches
- central Government and devolved administrations might need to make the parallel decisions for individual stretches of the strategic network, but these would need to take account of local conditions and changes in the vicinity, as well as the needs of strategic traffic, as discussed in Chapter 4
- there will almost certainly need to be tailored structural approaches for the devolved administrations, which will still need a central Government input recognising reserved controls on tax setting
- in the meantime, central Government encouragement and support is needed for local authorities to develop schemes so that they are consistent and interoperable, that they are subjected to proper appraisal and review, and with common and easily understood mechanisms to ensure compliance and to protect the privacy of the vehicle user.

[20] The ten year limit does not apply in Scotland, which is subject to the Transport (Scotland) Act 2001.

[21] Scottish Ministers confirm charging orders under the Transport (Scotland) Act 2001.

[22] DIRECTS is the first project which will demonstrate compatible electronic charging systems using microwave and a mobile positioning system under free flowing traffic conditions. See Annex C for more details.

[23] In Scotland, Scottish Ministers.

[24] In Northern Ireland the Department for Regional Development is the authority with powers in respect of both road and transport.

## Chapter 6: Pathfinders

6.1 Previous chapters have focused on a national road pricing scheme and its various elements, concluding that, while there are actions that could be taken in the meantime to facilitate it, a feasible scheme is still a decade or so away from operation.

6.2 This chapter looks at what other steps might be taken in the interim. It considers:

- the UK Lorry Road User Charging Scheme
- local congestion charging pathfinders
- conclusions.

6.3 There are several reasons for undertaking forms of road user charging on the more limited scale that is technically feasible now:

- there are problems on the road network now that charging can help to address
- we need to gain a better knowledge and understanding both of the practicalities of scheme administration and of the real world impacts that pricing has in both the short and longer term
- growing familiarity with road pricing should greatly improve public understanding of its benefits and consequent desirability.

## **Lorry Road User Charging**

6.4 The Government has announced its intention to introduce a system of distance charging for all goods vehicles using UK roads. The purpose of the Lorry Road User Charge is to ensure that all goods vehicles - including those from overseas - make a contribution towards the costs of road wear. The Government has made a commitment that the charge will be tax neutral for the UK haulage industry overall, with the charge being offset by a rebate on fuel duty on all fuel bought in the UK by charge-payers.

6.5 HM Customs and Excise has responsibility for implementing this lorry scheme. In March 2004 the Government announced that the charge will take effect from 2007/8, following trials during 2006. The main features announced to date are:

- the charge will apply to all goods vehicles running on UK roads, regardless of their nationality of origin
- the charge may differentiate between motorways and other roads, and could in the longer term reflect other factors such as time of day
- regular users will be required to install an on-board unit which will be used to calculate the charge. It has been concluded that this is likely to require satellite positioning technology. There is likely to be a separate arrangement for occasional users - those whose total mileage falls below a threshold - who could be required to obtain a 'Low-use On-Board Unit' that would be self-contained and would require the user to input tachograph readings or other information relating to distance
- full implementation of charging will be phased in, with the heaviest lorries being brought into the scheme first.

6.6 The procurement process was launched with an open day for potential suppliers on 12 May 2004. It is currently intended that these contracts should be signed by the end of 2005, with the main enabling legislation to be put before Parliament in the 2005 Finance Bill.

6.7 While LRUC will clearly anticipate many features of a national charging scheme, there are a number of key differences. Its immediate purpose is to ensure a fairer system of taxation rather than explicitly to change operators' behaviour. The number of vehicles affected will be around 500,000. Moreover, haulage operators are already operating in a highly regulated environment and are already required to use tachographs; many haulage firms already make use of sophisticated on-board telematics. LRUC will however provide important insights into the procurement and establishment of business structures and into

the operation and development of technology.

## **Local congestion charging pathfinders**

6.8 The Lorry Road User Charging scheme will be a valuable step, but it will not tell us all that there is to learn about responses to charging. Crucially, it will deal with a limited sector of traffic, and not with the myriad range of other road users. And, in the early stages at least, it will concentrate on establishing a fair competitive base for the haulage industry, rather than on allocating scarce road capacity.

6.9 There will be a lot to learn from London. TfL's latest annual report on the London congestion charging scheme[25] already contains a wealth of information on the initial reactions of road users, residents and business to the Â£5 charge. But the central London charging zone is not typical of the rest of the country, or even of London as a whole.

6.10 We suggest therefore that, when and where appropriate, the central Government and devolved administrations should find new ways of encouraging local authorities in other parts of the country with congested road conditions to introduce local schemes using cordon or area charging.

6.11 Central Government could help by providing financial and political support for local congestion charging schemes, and the complementary measures that would go with them, to form a package of solutions to the particular problems of the area concerned. From earlier work on local charging, as well as the work that has gone into this study, the Government should provide a package of guidance material on the key issues and options that local authorities would need to study.

6.12 Central Government guidance and practical assistance to local authorities in modelling local congestion and scheme impacts would be useful. It will be important to ensure that local schemes employ a consistent and credible underlying methodology if they are to command public support, and there is evidence that currently not all local authorities possess the resources or skills to model local schemes in such a way. Central Government already provides guidance on exemptions from schemes, and the management of exemptions could have significant implications for interoperability. In Scotland minimum exemption regulations are currently being made.

6.13 Development of a number of schemes similar to those we see today would have value locally. But once a certain level was reached, there would be a risk that they would lack coherence, and require road users who travel widely to open a number of accounts.

6.14 This gives rise to the question of whether central Government should have a role as a facilitator, providing common back-office and management services, and if so at what point in the roll-out of local schemes. There would be clear benefits in terms of consistency of interface with the public as well as ensuring interoperability in a way that is consistent with European law if central Government did take this role. The work on costings undertaken to support this report suggests that there is clear scope for substantial economies of scale. On the assumptions and scenarios used by our consultants, it would appear that eight or more local charging schemes would provide a level of transactions at which these economies of scale would be apparent, although more detailed and precise modelling is necessary in this area. This issue is discussed in further detail in Annex J.



6.15 It would help to pave the way for a national scheme if the Government gave consideration to how it could help with start up and back-office costs, perhaps with a view to laying down a foundation on which an eventual national road pricing body could be built. In the meantime, such an arrangement could provide a system whereby any road user registered for any charging scheme could use that account for other local charging schemes too.

6.16 Such approaches would help to build up the closer working relationship between the different tiers of government and neighbouring local authorities that would be needed to make national road pricing work.

6.17 At the more technical level, there would be value in different types of scheme being rolled out. The London charge is a flat Â£5 throughout the working day, partly reflecting the capital's consistently high traffic levels over that period. In some congested urban areas a degree of differentiation might be more appropriate, perhaps only charging in peak hours, or with different charges at different times. This would help to develop a better understanding of the responses of road users in this country to different prices and pricing structures.

6.18 It will become possible to trial a distance-based scheme. Some experimentation has already taken place, and it should be possible, once further testing and development has taken place, to operate a time and place scheme using positioning technology at a limited, voluntary level well before it is feasible to mandate this for the whole fleet. If this was successful, it would offer an alternative to cordon/area charging in an area where this had been adopted. It would help to open the way to demonstrating that such a scheme could provide not just for congestion charges in busy areas at peak times, but also that it could compensate motorists by a lower cost of motoring for uncongested times, perhaps via credits (given that they would already be paying fuel duty) to set against peak prices.

6.19 It is not only at the local level that pathfinders would be of value. Microwave technology can now toll motorways at high speed, without the need for toll plazas. Tolling existing strategic roads may make most sense where charging on such a road was as part of a more local scheme. But the M6 Toll road has successfully demonstrated that in this country, as well as elsewhere, tolled new capacity can gain popularity if it offers the choice to use an alternative to an existing route.

6.20 As this report notes (e.g. Chapter 2) experience in California is that there is considerable support for using variable prices to manage demand on new premium lanes (which in practice are segregated from the main carriageway). These schemes offer a reliable and optional alternative to enduring congestion on the previous route. Elsewhere, for example Melbourne or Versailles, tolling can fund the provision of new infrastructure which would not otherwise be affordable, enabling motorways to bypass or tunnel under congested urban centres. In both these cases the degree of congestion on the alternative routes makes tolling feasible without generating unacceptable levels of diversion.

6.21 The Government and devolved administrations have programmes to provide new strategic road capacity. They could actively consider whether schemes being worked up could be funded and/or demand-managed using similar approaches to those which have gained public support in other countries.

6.22 Highway authorities considering new capacity in areas where there are environmental issues could consider the extent to which a tolled tunnel could provide additional capacity which would not otherwise be feasible, without unacceptable impacts on the environment.

## Conclusions

6.23 There are good reasons for taking steps now. A number of imaginative options are technologically feasible. Implementing some would offer solutions to congestion problems that we face on our roads today, improve our knowledge of road pricing, and demonstrate to a wider public the benefits that a national road pricing scheme could eventually deliver. Government guidance and practical assistance on scheme implementation would help local authorities. Further testing of technologies and sharing information widely would also be of benefit.

6.24 If it were possible to implement sufficient pathfinder schemes and begin to centralise their administration these would themselves begin to form an application of road pricing in a national framework.

[25] Impacts Monitoring â Second Annual Report: April 2004.

## Chapter 7: Conclusions and next steps

7.1 This chapter brings together the elements of this report and concludes that:

- national road pricing is becoming feasible
- national road pricing could meet the Government's objectives
- the implementation of road pricing requires the promotion of a greater degree of public consensus on the case for proceeding
- a number of steps could be taken now, which could establish a trajectory towards national road pricing.

These conclusions are all dependent on central Government taking action now.

### National road pricing is becoming feasible

7.2 Road pricing at a local level, whether conventional tolling to pay for infrastructure or to reduce congestion, as in London, is already with us. Technological developments mean that charging can be applied electronically, without the need for toll plazas, even at motorway speeds.

7.3 There is sufficient confidence in the ability of current technology to support a charging scheme for the Government to be pressing ahead with distance charging for lorries.

7.4 But there is a big difference between such local schemes, and even the Lorry Road User Charging scheme, which are limited in size, either on the basis of geographical area or to a relatively small part of the overall fleet, and a fully national road pricing scheme. And the technological specification for the Lorry Road User Charging scheme is based on the fact that lorries already have precisely calibrated tachographs fitted.

7.5 Satellite navigation systems, using mapping technology, are also already with us. But affordable and practical systems are not yet sufficiently precise and reliable to support a charging system that would need to place every vehicle accurately for every part of every trip it makes. Other potential technological solutions exist, such as location by cellular radio, and a hybrid which seeks to harness the strengths of

both satellite navigation and cellular radio, but are as yet in their infancy.

7.6 National road pricing is thus not currently technologically feasible in terms of practicality, functionality and cost. But it is becoming so. Our best estimate is that it will be available within the next 10 to 15 years. This view is based on market-led development of satellite navigation and the deployment over the coming years of the Galileo satellites leading to more accurate and reliable equipment. Prices are falling. Satellite navigation systems are set to become standard fitting on mainstream popular cars within a few years, and insurance companies are also interested in the possibilities they offer for pay-as-you-go policies.

7.7 So, like other cutting edge technologies, we have good reason to expect functionality to emerge and the predicted cost of the equipment needed for a national road pricing scheme to fall considerably over the coming years.

7.8 Our best forecast is that the earliest date on which a national road pricing scheme could begin to go live would be about 2014. This is inevitably based on a number of big assumptions about the nature and pace of future developments.

7.9 Two significant factors will be the extent to which the development of technology is taken forward having regard to the functionality that a road pricing system would require, and the extent to which common standards can be developed and applied in a way that ensures that functionality is provided in a way that minimises cost and maximises interoperability. A proactive approach by the Government within the European Union, will help ensure that the 2014 date for the availability of equipment at a credible price is met.

**7.10 If the Government wishes road pricing to become an option for the next decade, we conclude that it will need to take a lead on these issues. The strength of its commitment to explore and promote the relevant standards would send a signal to the supply industry and the bodies responsible for international standards, both of which would influence timing.**

## **National road pricing could meet the Government's objectives**

7.11 We believe too that a national road pricing scheme which went live in ten or so years' time could meet the various objectives that the Government set when commissioning this study - in summary:

- more efficient pricing
- fairness, respect for privacy and promoting social inclusion and accessibility
- higher economic growth and productivity for all regions of the UK
- environmental benefits.

7.12 The ability to meet these objectives would, however, depend on a number of factors about the way it was developed and applied.

7.13 First, it would require a recognition that setting prices and the boundaries between different price levels requires considerable knowledge of localised conditions - the nature of the traffic affected, and the land-use and demographic patterns in the vicinity. Getting these wrong could potentially give incentives to undertake longer journeys, or impinge unfairly on different sectors of the population. We also need to understand better than we do today how different road users would respond to different price signals,

recognising that individuals are likely to respond differently depending on the particular circumstances of the trip they are making.

7.14 Second, road pricing is not a complete answer in itself. It is a means of making better use of existing capacity, and as such it is part of the toolkit for addressing the pressures on the road network from congestion and environmental issues. There is no point in trying to use prices to influence behaviour if there is no viable alternative. At different times and places, and for different road users, these alternatives will be to travel at a different time, to travel at the same time but in a different way or to undertake the activity concerned by a different means, such as internet shopping and tele-conferencing. If these options were not available, the result would simply be to disadvantage those less able to pay.

7.15 Hence, road pricing needs to be part of a package of measures. The key is to use pricing as an incentive to lock in the benefits of other measures, so that the reduction in congestion brings the widest possible benefits. These other measures include better land-use planning, to reduce the distances that need to be travelled, better public transport which can gain from less congested roads, and other supply-side measures such as additional road capacity where possible, school transport and car-sharing schemes.

7.16 We believe that there are sufficient numbers of road users who could, if the right opportunities were available, change their time or way of travel in response to pricing without serious inconvenience to themselves, and in return gain a better overall transport experience.

7.17 Third, we need to recognise the scale and complexity of any system that would deliver road pricing, and the large degree of change that it would bring about. This suggests that the introduction of national road pricing would be a major delivery challenge, and would not be suitable for a 'Big Bang' approach. A period of transition would almost certainly be necessary. This would require more thought at a future date.

7.18 If the Government was persuaded of the case for going in the direction of national road pricing, it would be neither appropriate nor necessary to commit to a given timetable or technological solution right now - there are too many uncertainties. But it would need to be driving the agenda, not waiting for local or regional government to make the first moves, but actively working with them, making sure that all the necessary pieces of the jigsaw come together in the right way.

7.19 Fourth, we must recognise that in this Study it was never going to be possible to bottom every single issue, particularly regional differences, and factors such as social inclusion which are very specific to local circumstances. A good deal more preparatory work remains to be done, and we believe there is a good case for that work to follow hard on the heels of this Study.

**7.20 Clearly there is a good deal of work to do if road pricing is to become a reality. The Government must accept that it cannot do all this work itself. If it wishes to make road pricing possible, central Government will need to take a lead, and commit to working in a new way over a sustained period across the different tiers of Government, and across administrative boundaries.**

## **The need to promote a greater degree of consensus**

7.21 As noted above, implementing a national scheme would require a sustained effort at all levels of Government over many years, with national government constructing and operating a basic distance charging scheme, local government working out the modulations in price to respond to local conditions, and national and devolved administrations considering these modulations for the strategic routes. This

level of collaboration would only be possible if there was a sufficient level of consensus in favour of pricing. That in turn requires knowledge of the benefits pricing can bring, through a national debate, and a judgement on what people would find acceptable as a pricing proposition.

7.22 Today road pricing is not well understood as a concept. Not surprisingly most people's reaction is that it means paying more to do something that so far they have thought of as being free. Not unreasonably, since that is how tolling and local congestion charging have operated so far. In fact, road pricing is less about the overall cost of road use, and much more about paying *differently* to improve the use we make of limited road capacity. So there is much to be done in terms of education and illustration.

7.23 Also, the Steering Group has not come to a consensus view on what the necessary preconditions for acceptability would be (as opposed to the need for acceptability itself). Acceptability would be influenced by many factors including the design of the scheme, the level of charges, the way the scheme fitted with wider measures, and what use was made of the revenue. The mechanics of how a scheme would work are important because a particular driver of acceptability would be the confidence and trust people had in the institutions that would take decisions, set and collect charges etc.

7.24 The Group therefore concludes that a key task for Government will be to lead this debate, which should focus on:

- developing a more concrete proposition for national road pricing and how it would work, beginning with this study, so that people can engage with a real proposition, not just an abstract concept
- building a consensus around its objectives - build on the work undertaken through this study to illustrate and explain the benefits that could be achieved
- developing a better understanding of the needs of road users, not just of individuals, but of different sectors of business too
- opening up the issue of what would make pricing more acceptable. While the modelling shows that higher overall costs would provide the best outcomes, nearly as much can be achieved without an overall increase in the cost of motoring. Or would motorists and the public at large prefer road pricing to be used to boost transport spending or to reduce other taxes?
- as a concrete proposition emerges, promoting clarity in how it would work and trust in the institutions that would operate it.

7.25 Other stakeholders including road user groups, devolved administrations and local government and the media should participate actively, objectively and constructively in this debate. The debate should be based on facts, rational analysis, and, as far as possible, be informed by real-world examples and pathfinder schemes.

**7.26 Given the importance of gaining sufficient consensus, we believe the Government should promote an informed national debate in order to improve understanding of road pricing, what it could achieve and where we would be without it.**

## **A number of steps could be taken now**

7.27 National road pricing is still some years off, and the long lead time to implementation will begin once a decision to proceed is taken. But there are good reasons for taking action on the ground now. Modelling, surveys and forecasting can only take knowledge of the real impacts of pricing so far. We need a larger

database of knowledge and experience of the reactions of UK road users to pricing than just the London Congestion Charge, as well as better understanding of the technology, costs and management structures. London has shown that congestion charging does work. Additional, well designed, local charging schemes in the more congested urban areas would provide very significant benefits in their own right.

7.28 A number of local authorities have considered using the powers currently available to them to introduce local congestion charging or similar demand management schemes such as a parking levy. But London is so far the only one to have made real progress. There appears to be insufficient perceived gain for local voters and local authorities to take the plunge. The success of the London scheme is gaining popular recognition across the country. But central and devolved administrations should consider what they could do, in co-operation with local authorities, to make road pricing more attractive. This could partly take the form of greater encouragement and leadership in the national debate that we recommend, but it could also include practical help for any local authority seeking to put together the package of measures necessary to complement road pricing, and support for the scheme's administration, potentially enabling interoperability so that road users need only one account to pay for a charge in any location.

7.29 The design of local schemes will need to follow local objectives and needs, but could take a number of forms. They could follow the London model of an area (or a cordon) for which there is a charge throughout the working day, using either the automatic number plate recognition technology of London, or microwaves as in Singapore. If traffic levels did not justify all day charging, it would be possible to charge for a more limited period. Available technology could also support charges which varied between congested and less busy periods.

7.30 Such an approach, of building up a number of small schemes, would amount to a trajectory towards a national road pricing system. It would:

- bring the benefits of congestion charging that have been demonstrated in London and elsewhere to more of our cities and to strategic routes
- improve understanding of responses to price signals and the costs of running schemes
- inform public opinion about the benefits of pricing
- leave open until the appropriate future moment choices either of principle or method that will have to be made along the way.

7.31 If the Government wishes to make progress towards national road pricing there are a number of steps that it ought to take:

- inform and lead a debate to promote public understanding and trust
- develop proposals on how receipts from road users would be governed, managed and accounted for, and how motoring taxes would be dealt with on the introduction of any road user charging system
- develop a detailed research programme into road users' attitudes and behaviour, including market research, to inform scheme design and provide a better understanding of the range of travel choices and pricing options which would reflect the different needs of different segments of society; and develop and evaluate pricing propositions likely to appeal to road users as consumers, while keeping the price signals needed to have the right effect
- work with car manufacturers, and take a lead in the EU, on the standards and agreements for equipment in vehicles
- provide detailed guidance and practical assistance to local authorities considering introducing a

variety of local charging schemes

- consider how best to provide appropriate incentives to local authorities to introduce local schemes
- consider whether a national back-office and management function would be worthwhile and value for money
- proceed with and develop existing trials of technology
- consider the case for charging for new strategic capacity, building on the successful model of the M6 Toll
- work closely across all levels of government and with stakeholders to share knowledge and consider how best to deliver the benefits of charging.