



CONSERVATIVE
— WAY FORWARD —

STOP THE WAR
against drivers

Malcolm Heymer

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OUR PRINCIPLES

Nationhood

Each nation must be free to determine its policies to the benefit of its citizens.

Freedom

For responsible individuals, guaranteed by the rule of law administered by an independent judiciary and minimal state activity.

Democracy

The exercise of political power, with the consent of the people – through regular elections on the basis of universal suffrage and a secret ballot.

Security

The first duty of the state is to provide external and internal defence of the citizenry.

Community

Defined by geography, tradition, inheritance and sense of identity.

Capitalism

The most effective system of wealth creation. Free markets are blind to gender, race, class or religion.

Choice

For individuals must be maximised – even if the state accepts responsibility for provision of a safety net.

Enterprise

Fostered by a low tax, low inflation economy – with currency exchange rates determined by the free market.

Deregulation

Domestic and global – to maximise freedom of choice and individual responsibility in an improved society.

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Chapter 1

Introduction

The motor vehicle has arguably had a greater effect on our way of life over the last hundred years than any other invention during that time. It has allowed people to travel where and when they want in a way that had never existed before. The flexibility provided by the car, compared with public transport, has opened up a whole range of employment and leisure opportunities; road freight transport has led to improved efficiency in the manufacture and distribution of goods. As a result, 86 per cent of passenger travel in the UK in 2004 was by car, van, taxi or motorcycle¹, and 89 per cent of inland freight transport was by road².

The freedom provided by the motor vehicle is not universally applauded, however: there are those who resent the loss of state control over individual choice that the car represents. Such people rarely admit their prejudices openly; instead, they make false or exaggerated claims about the adverse effects of road transport in order to justify calls for higher taxation or restrictions on mobility.

Road users contribute £44.6 billion in taxation to the Treasury every year, but only £7 billion is spent on the road network. Around 63 per cent of the pump price of a litre of fuel is tax, the highest in Europe². Yet there are still some who claim that drivers do not pay enough to cover the social and environmental costs of motor vehicle use. This fallacy was exposed in a report by economist David Newbery, who concluded that, “current transport taxes...more than cover the full social and environmental costs of transport, as well as the cost of providing the transport infrastructure.”³

Another much repeated claim is that building new roads or widening existing ones simply generates more traffic. But a study of historic traffic data⁴ shows that growth is related to the state of the economy, not the level of investment in the road network. Traffic levels fell in the recession of 1978–79, rose sharply in the second half of the 1980s, then stagnated from 1990 to 1993. Traffic growth resumed in the mid 1990s, even though this was a period of declining investment in the road network².

Planning policies aimed at reducing car use have failed: limits on parking spaces in residential areas do not curb car ownership but increase on-street parking; reduced parking provision in town centres leads to more congestion as drivers search for spaces. Many local authorities, encouraged by government policies and funding arrangements, have taken road space from cars and lorries in an attempt to coerce drivers out of their cars and onto public transport and bicycles. In many cases the result has simply been more congestion, slower journeys, and damage to the viability of town centres.

Road safety policy, both at national and local level, has been driven as much by a covert desire to discourage car use as by the aim of reducing casualties. Many traffic calming schemes and reduced speed limits have been introduced without any objective safety justification, but have instead sought to dissuade drivers from using certain roads or areas.

The traditional 'Three Es' approach to road safety – engineering, education and enforcement – has been largely abandoned in favour of enforcement alone, especially of speed limits. This is an attractive option for government, as it involves relatively little expenditure while being able to claim, aided by a widespread misconception of the value of speed limits, that it is serious about improving road safety. But the result has been, since the mid 1990s, that the year-on-year decline in casualties of the previous three decades has stalled: between 1965 and 1994, road deaths per year had fallen from 7,952 to 3,650, but they only fell a further 449, to 3,201, by 2005.⁵

The slowdown in the improvement of road safety has coincided with an explosion in the numbers of drivers penalised for exceeding speed limits. Between 1995 and 2004, annual speeding prosecutions in England and Wales rose from 206,900 to 2,104,800⁶. This huge increase is due to the roll-out of automated speed camera enforcement, especially since the cost-recovery scheme has enabled camera partnerships to reclaim the costs of enforcement from the income produced by fixed penalties.

In parallel with the increase in speed enforcement, many local authorities have taken over enforcement of parking regulations from the police, under the powers of the 1991 Road Traffic Act. As a result, prosecutions for obstruction, waiting and parking offences in England and Wales almost doubled between 1994 and 2004, from 4.4 million to 8.5 million⁶.

These huge increases in driver prosecutions are the result of allowing camera partnerships and local authorities to fund their enforcement activities from the income received in fines and penalty charges. This has led to enforcement being targeted for maximum revenue generation, rather than to achieve compliance with regulations where it is actually needed to improve safety or reduce congestion.

While highway authorities and enforcement agencies are never slow in penalising drivers, they give a much lower priority to minimising traffic disruption. Many road works take longer than necessary due to 'office hours' working; delays are increased when restrictions apply far beyond the area where work is taking place; after accidents occur, traffic can be delayed for extended periods while the police gather evidence, on the assumption that one or more drivers must be guilty of an offence.

All these practices show contempt for road users and the value of their time. Government and public agencies put their own convenience and interests before those of the public, whom they are meant to serve. A future Conservative government will take action to reverse these attitudes and the failed policies of the past, to give a fair deal for all road users.

Chapter 2

Unjustified attacks on cars

Measures to discourage car use are often justified by claims about the detrimental effects of traffic, particularly on health or the environment. Many of these claims do not stand up to scrutiny, but their constant repetition has led them to be popularly accepted as fact. In this section we will examine the issues surrounding the attacks on car use and provide a more balanced assessment. We will also look at the adverse effects on drivers of the types of scheme that highway authorities have installed and suggest alternative approaches.

Air quality

The main components of vehicle exhaust gas are harmless nitrogen, carbon dioxide and water vapour. There are also traces of compounds that in high concentrations can be harmful to health, such as carbon monoxide, oxides of nitrogen, benzene, particulates and sulphur dioxide. Advances in engine technology have led to dramatic reductions in these compounds, despite rising traffic levels: between 1980 and 2003, emissions of carbon monoxide fell by 74 per cent, nitrogen oxides by 33 per cent, benzene by 90 per cent, and sulphur dioxide by over 70 per cent⁷. Emissions of particulates from road transport fell by 46 per cent from 1990 to 2001⁸, with around a quarter of particulates coming from road transport sources, mostly diesel-engined vehicles⁷.

The result of these improvements is that few people are ever exposed to levels of pollutants in excess of national air quality standards. Only oxides of nitrogen (NOx) and particulates are ever likely to be encountered at higher levels: it is estimated that, by 2010, there will be 98 per cent fewer people in the UK subjected to concentrations of NOx in excess of the national standard, compared with the number who would have been affected if the reductions in emissions had not been achieved⁸.

Even in a large city like London, vehicle emissions are not a significant concern in most areas. In 1999, Westminster City Council commissioned the Transport Research Laboratory (TRL) to examine options for introducing a low emission zone in London. In its report⁹, TRL concluded that, "Restrictions on cars...are not warranted solely on air quality grounds." Instead, it proposed that action should be taken against the most polluting vehicles, mainly older goods vehicles and buses with large diesel engines.

Where air quality standards are exceeded, it is usually around congested junctions or roads carrying large numbers of buses or heavy goods vehicles. For example, Oxford City Council has declared an Air Quality Management Area (AQMA) covering part of Oxford city centre. Within the AQMA, cars make up 60 per cent of the traffic but contribute only 15 per cent of the NOx emissions. By contrast, buses and coaches produce 64 per cent of the NOx while comprising just 18 per cent of the traffic¹⁰. Figures like these challenge claims that drivers should leave their cars at home and use a bus in order to help the environment.

Another common claim is that pollution from traffic causes respiratory problems, such as

asthma. But while the incidence of asthma has undoubtedly been rising, it has done so against a background of improving outdoor air quality. In fact, there is no correlation between asthma incidence and levels of outdoor pollution, from traffic or other sources; rather, the reverse is true. A 1999 report for the NHS Executive concluded that, "...the available evidence does not support a causative role for outdoor air pollution."¹¹

Asthma appears to be mainly an affliction of affluent societies, but the causes are not clear. One possibility is indoor air pollution from chemicals in furnishings, cleaning products, heating and cooking¹², with research showing that a modern home can contain pollution levels up to seventy times higher than outside¹³. Another theory is that an obsession with hygiene and the overuse of antibiotics can prevent children's immune systems from developing properly¹⁴.

Whatever the causes, there is no doubt that concentrations of certain pollutants can trigger attacks in asthma sufferers. As we have seen, however, pollution from traffic has fallen dramatically despite rising traffic levels, and continues to do so.

Climate change

Claims that changes in global climate are the result of man-made emissions of greenhouse gases, especially carbon dioxide, are used as a pretext to demand increased taxes on vehicle use and restrictions such as lower speed limits. Yet the level of public debate about this highly complex subject has often been at a simplistic and emotive level, rather than a serious examination of the scientific evidence. Indeed, attempts to question the claimed 'scientific consensus' are often met with abusive personal attacks designed to discourage dissenters – a clear sign that the issue has been hijacked for political purposes.

There are two questions that need to be considered: whether man-made emissions of carbon dioxide are actually changing the world's climate; and, even if they are, whether any action taken to reduce the UK's emissions could have a significant remedial impact at a global level.

On the first point, a scientific consensus on the causes of climate change does not exist, despite strenuous efforts to create that impression by those who wish to maintain and exploit public alarm. As explained by Dr Patrick Moore, a co-founder of Greenpeace, in an open letter to the Royal Society¹⁵, the claimed link between carbon dioxide emissions and global warming does not even merit the scientific title of 'theory'; it is merely a hypothesis, since causation has not been demonstrated in any conclusive way. He also points out that the recent warming trend began long before human-caused increase in carbon dioxide was evident.

The main alternative hypothesis to explain climate change is rapidly gaining credibility: variations in the sun's output of charged particles and in its magnetic field, linked to the sun-spot cycle, affect the flow of cosmic rays reaching the Earth's atmosphere, where they help to seed clouds. At times of high solar activity (such as recently), fewer cosmic rays reach the atmosphere so there is less cloud cover; more of the sun's heat radiation reaches the Earth's surface and the planet warms. When solar activity is low, more clouds form and reflect the sun's radiation back into space, so cooling takes place. Evidence is mounting to support this hypothesis^{16, 17} and there are some scientists predicting a period of global cooling ahead, as solar activity decreases^{18, 19}.

There is also nothing unprecedented about recent global temperatures or rates of change. There have been many fluctuations in temperature since the end of the last ice age, most recently the Medieval Warm Period of around a thousand years ago and the Little Ice Age that

followed it. The existence of these natural fluctuations is an embarrassment to the proponents of man-made climate change, and attempts have been made to rewrite climate history to eliminate them²⁰. Also, since direct daily observations of temperature only began during the Little Ice Age²¹, claims about recent temperatures being the 'hottest ever recorded' are highly misleading.

Even if man-made carbon dioxide emissions were the cause of climate change, any measures that the UK could take to reduce its own emissions would have a negligible impact at a global level. In 2004, the UK emitted 158.09 million tonnes (carbon equivalent) of carbon dioxide, amounting to 2.1 per cent of the world total²². Of the UK figure, 21.6 per cent came from road transport in 2004²³, or 0.46 per cent of the world total.

While road transport in the UK emits 34 million tonnes of carbon per year, China's total output of carbon dioxide in 2004 was 1,284 million tonnes (carbon equivalent), up from 1,063 million tonnes in 2003²². Thus a single year's increase in carbon emissions by China, at 221 million tonnes, was six and a half times the output from road transport in Britain, or 40 per cent more than the UK's total emissions.

Any reduction that could be achieved in the UK's road transport emissions would be insignificant by comparison: a 10 per cent reduction would be negated in less than six days, if China's emissions continue to grow at their current rate. There can be no justification, therefore, for taxation increases or other restrictions that would affect mobility, on the grounds of tackling climate change. Suggesting that an example set by the UK would lead countries such as China and India to forgo the benefits of economic growth is risible.

Whether climate change due to greenhouse gas emissions is real and set to continue or not, responses to it need to be based on rational assessments of the costs and benefits of the options, not futile, damaging and expensive political gestures. This was the message delivered by the House of Lords Select Committee on Economic Affairs in its 2005 report²⁴, in which it also pointed out that there are positive aspects to global warming, such as fewer cold-related winter deaths. There is no justification for singling out the drivers of Britain as responsible for climate change.

Road space reallocation

Many local authorities have taken road space away from cars and goods vehicles and given it to buses and cyclists, in order to promote these 'green' modes of transport. They have been assisted – or coerced – in doing this by funding arrangements that punish councils which resist government transport policies. The result has been a loss of capacity on many roads, leading to increased congestion and drivers finding alternative routes through residential areas. In turn, this has led to demands for so-called 'traffic calming' schemes and further controls on traffic movement, which are also encouraged by government funding priorities. We will now examine the muddled thinking behind this vicious circle of attacks on drivers and how it can be reversed.

Bus lanes

Bus lanes are installed in urban areas to speed the passage of buses, usually on the approaches to junctions where delays occur. In a typical situation, one lane of a two-lane approach is dedicated to buses up to a point close to the junction. Other vehicles are restricted to a single lane, effectively doubling the length of the queue. Where junctions are closely spaced, this can lead to tailbacks affecting locations upstream. The main objection to bus lanes, however, is that they reduce the passenger-carrying capacity of the road network as a whole.

To illustrate this, it is necessary to look at how many people are carried in different types of vehicle. The most detailed information on bus occupancy, that is the average number of passengers per bus, comes from the London Travel Reports published by Transport for London (TfL). In its 2005 report²⁵, TfL quotes bus occupancy in London in 2004/05 as 15 passengers per bus. Bus services in London are better used than in other parts of the country and TfL estimates that bus occupancy in London is twice that of other metropolitan areas. This suggests a figure of around 7.5 passengers per bus is more typical of most of the UK's urban areas. In his submission to the Parliamentary Select Committee on Transport's inquiry into bus services across the UK in May 2006, Dr Alan Storkey estimated that overall bus occupancy rates may not be much more than 10 passengers per bus²⁶. The National Travel Survey shows that average car occupancy in 2004 was 1.6 people per car²⁷.

In urban areas, maximum traffic flow is normally dictated by the throughput of major junctions, rather than the capacity of the roads joining them. In a simple example, we will assume that a two-lane entry into a junction controlled by traffic lights has a capacity of 1,000 vehicles per hour. By dedicating one of the approach lanes to buses, the capacity for other vehicles is reduced to 500 per hour. If those 500 vehicles were all cars carrying an average of 1.6 people each, they would transport 800 passengers per hour. Assuming 10 passengers per bus, there would need to be 80 buses per hour using the bus lane to equal the number of passengers carried by car. This is a very high figure and, as we have seen, high concentrations of buses can cause air quality problems. In practice, bus lanes often carry fewer than 15 buses per hour.

Of course, in peak commuting periods bus occupancy is likely to be higher and that of cars will be lower. But even in the extreme case of trips into central London in the morning peak, where buses each carried an average 43.7 passengers and cars 1.37 in 2004²⁸, more than 15 buses per hour would need to use the bus lane in the example above in order to match the number of people transported by car. Many bus lanes operate for twelve hours per day or even longer, so they fail to boost overall network capacity for much of the time, if ever.

It is clear that the spread of bus lanes has been driven by an ideological desire to restrict car use and not to improve the efficiency of the road network overall. While buses are an important part of the transport system, the level of priority afforded to them in many areas is not justified by objective analysis. Local authorities should be required to assess all their existing bus lanes, and proposals for new ones, on the basis of their impact on network capacity as a whole. Where this impact is found to be negative, bus lanes should be removed or operating hours reduced, and proposed schemes should be abandoned.

Cycle lanes and facilities

There is no doubt that cycling is a valuable mode of transport, especially in urban areas where it can help reduce congestion. Unfortunately, many schemes introduced by local authorities, in response to pressure to 'assist' cyclists, are so badly conceived and implemented that they create danger, delay traffic, and cause animosity between cyclists and other road users.

Cycle lanes marked on the road are supposed to give cyclists a feeling of safety but often have the opposite effect. By segregating cyclists from motor vehicles in this way, cyclists feel pressured into riding within the cycle lanes and drivers do not always give them enough room when overtaking. Thus cyclists tend to be 'squeezed' more by passing vehicles than if they were riding as part of the general traffic, but drivers may resent a cyclist riding in a more assertive, prominent and safer position on the road if a cycle lane exists.

Cycleways marked on footways alongside urban roads are often interrupted at frequent intervals by crossings of side roads and entrances, where cyclists need to give way. Consequently, cyclists may make less progress than if they cycled on the road, but may again be resented by other road users if they do so. Shared footways may be helpful to younger or less confident riders, but for experienced cyclists are worse than no facility at all.

In urban areas, where speed differentials between cyclists and motor vehicles are relatively low, little in the way of physical infrastructure is needed to help cyclists use the roads safely. Most on-road cycle lanes should be removed and attention given instead to encouraging cyclists to take training, such as that provided by the Cyclists Touring Club²⁹, on how to use the roads confidently as part of general traffic. Cycling can be encouraged more by secure cycle parking facilities at locations such as shopping centres and public transport interchanges than by white paint and coloured road surfaces.

Outside urban areas, where the difference in speeds between cyclists and motor vehicles is greater, the presence of cyclists on the road can cause frustration for drivers and danger to cyclists, if drivers do not give them sufficient room when overtaking. Here there is a good case for providing cycle tracks physically separated from the road where possible.

Traffic lights

Traffic lights may be essential to control traffic safely and efficiently at busy junctions but they often cause unnecessary delay at off-peak times. Installations of traffic lights have increased sharply in recent years, and the cumulative effect has been to lengthen journey times. For example, in London in 2005 there were almost 5,000 sets of traffic lights, an increase of nearly 750 in five years³⁰. Yet average traffic speeds in central London between 2003 and 2006, with the congestion charge in place, were virtually the same as in the period 1990 to 1997, despite a reduction in traffic of around 15 per cent³¹.

Some of the extra traffic lights have been installed in urban areas as part of bus lane and other bus priority schemes. Others may be intended to assist cyclists or pedestrians and, while some of these are undoubtedly justified, many reflect the desire of local authorities to display their 'green' credentials.

As well as introducing new traffic lights, the timings of many installations have been altered to give priority to buses or cycles, or to delay traffic on particular junction approaches in order to discourage the use of those roads. The result is that many junctions operate below their optimum capacity, which affects the road network as a whole.

To reverse this situation, traffic authorities should be required to review all their traffic light installations to determine whether they are needed at all and, if so, whether their timings are set to maximise the capacity of the network for all road users. It may be necessary to strengthen the requirements of the Traffic Management Act 2004 concerning the duty of traffic authorities to manage their road networks. While the Act requires authorities to secure the expeditious movement of traffic, it allows them to take account of their other policies and objectives – which may be designed to have the opposite effect.

Greater use should be made of part-time traffic lights where it is not possible to remove them altogether. Some roundabouts with high peak-hour traffic flows already have traffic lights that are switched off during the rest of the day and at night. There are many others, however, where the traffic lights operate round the clock, including periods when the junction should be able to

work perfectly adequately as a normal roundabout. This causes unnecessary delay and frustration. While a few roundabout junctions may be so complex that traffic light control is desirable for safety reasons at all times, the use of part-time signals could be extended to the majority.

There are many other types of junction where traffic lights operate that could function perfectly well without signal control at off-peak times. In many cases the lights could simply be switched off, allowing the junction to revert to give-way operation. A further option could be to adopt the system used in some European countries, where the traffic lights flash amber on all approaches, signifying that drivers should proceed with caution. In this case, the junction could possibly operate in the same way as a mini-roundabout, with traffic giving way to vehicles from the right. Research should be undertaken into this possibility and it would need to be tested experimentally before being rolled out nationally.

Traffic calming

Arguably the aspect of modern road engineering most hated by drivers is the spread of so-called 'traffic calming' schemes, especially road humps. While the latter are effective in reducing vehicle speeds, they have many negative impacts. From a driver's point of view these include premature wear of suspension and steering components, and damage to exhaust systems. Drivers (and their passengers) with back problems may suffer discomfort, or worse, from repeatedly travelling over humps. This is also a concern for ambulance crews transporting people with suspected spinal injuries, or attempting emergency treatment on the way to hospital.

Delays to emergency services' vehicles as a result of road humps are also of serious concern. In 2003 the chairman of the London Ambulance Service estimated that 800 victims of cardiac arrest in London die for every minute of delay caused³².

Residents of streets where road humps have been installed suffer from the increased noise of vehicles accelerating and braking, often in a lower gear than if they were travelling at a constant speed. They may also suffer from vibration as vehicles, especially lorries, drive over the humps. The extra traffic signs required, as well as the humps themselves, detract from the street scene.

Forms of traffic calming other than road humps usually attempt to reduce traffic speeds by bringing drivers into conflict with one another. Chicanes and pinch points limit road width, forcing one driver to give way to another from the opposite direction. This sometimes leads, however, to drivers accelerating in an attempt to get through the obstruction first, thus increasing speeds rather than reducing them. Just as worryingly, it causes drivers to focus further ahead, instead of watching out for hazards closer in front of them, as they should be doing in a built-up area.

Traffic calming features that restrict traffic to a single lane introduce hazards that did not previously exist. When badly sited, such as on or just after a bend, they can be particularly dangerous. Cyclists may find themselves squeezed by motor vehicles if they cannot ride around the obstructions. In order to mitigate these dangers, the forest of traffic signs required is ugly and intrusive, especially in attractive villages.

Given all the negative impacts of conventional traffic calming, it seems astonishing that so many schemes have been installed in recent years. Road humps first came to widespread public attention as a means of discouraging criminal 'joy riders' from racing stolen cars through

deprived housing estates. Residents of other areas then started demanding them as a perceived solution to 'speeding' by drivers generally.

While there are undoubtedly residential streets and village centres where some drivers travel at inappropriate speed, much of the popular perception of speeding stems from increases in traffic flow rather than speed itself. As vehicles pass a person's home with increasing frequency, the impression can be gained that the traffic is travelling faster, when it is not.

Although traffic levels have increased over the years, residents of some areas have suffered more than others due to the policies of both central and local government. Reduced investment in the road network since the early 1990s has led to many bypass schemes being shelved, leaving towns and villages to suffer worsening environmental impacts from through traffic. In cities, delays to traffic on main roads as a result of anti-car schemes have led drivers to seek alternative routes through residential areas, fuelling demands from residents for measures to discourage them. Road humps installed in the worst affected streets simply displace the problem, leading to demands for action in more roads – and so the vicious circle continues.

The exponential increase in numbers of traffic calming schemes has been assisted by government funding policies. Misleading claims about accident reductions, coupled with the relatively low cost and prevailing anti-car culture, have led to councils being actively encouraged to install more of these schemes.

There are signs, however, that the tide of opinion is turning against intrusive traffic calming, as the proliferation of schemes exposes more people to their negative effects. Residents who are initially in favour of road humps often change their minds when they have to live with them. Some highway authorities have stopped installing road humps and others have even begun to remove them. One example is the London Borough of Barnet, which is not just removing humps but is also freeing up its main traffic routes to reduce the temptation for drivers to cut through residential streets. This is despite strong opposition from the anti-car lobby, with threats to withhold future funding and dire predictions of more accidents – which have not materialised.

The current approach to traffic calming in the UK is symptomatic of the way drivers are treated in general – as incapable of acting responsibly without constant regulation and coercion. In fact, the majority are reasonable people and resent being treated like naughty children. Several European countries are turning away from intrusive, physical traffic calming and are instead finding ways to reduce speeds through a range of measures that can loosely be termed 'psychological' traffic calming. Some progressive local authorities in the UK have also begun to embrace the concept. Its potential benefits will now be discussed.

Psychological traffic calming

The speed at which drivers travel along a particular road is determined largely by the visual environment ahead of them, which informs their perception of the level of danger. Thus drivers will travel faster along a wide, straight road through open fields than on a narrow, twisty street through a village centre. Most drivers are capable of adjusting their speed to a safe level reasonably well for changing conditions. (This is discussed in more detail in the section on road safety policy.) There are circumstances, however, where the speeds chosen by drivers, while not necessarily unsafe, may seem excessive to residents, pedestrians or cyclists.

To get drivers to reduce their speed in these situations, without resorting to physical traffic calming, requires the visual environment to be changed to create a perception of greater risk.



Pedestrian crossing without guardrail



Cycle parking and pedestrian crossing



Minimal street furniture and signs

This can be achieved in a variety of ways, including narrowing the carriageway, tree planting, lowering lamp columns, and additional road signs and markings. The effectiveness of a range of these measures has been investigated by the Transport Research Laboratory^{33, 34}. While most produced some reduction in traffic speeds, they were generally not as effective as 'traditional' traffic calming.

Some measures, such as extra signs and road markings, add to visual intrusion in settlements and rural areas. An alternative and more radical approach, which is becoming popular in some European countries, is to remove all but the most essential traffic signs, road markings and other street furniture in order to blur the distinction between areas reserved for vehicles and other road users³⁵. This 'shared space' concept breaks down the traditional idea of one type of road user having right of way over another and makes everyone take more care. As a result, traffic speeds are reduced and streets become more attractive places for everyone.

Shared-space schemes have yet to gain general acceptance in the UK, but one outstanding example is High Street, Kensington. This main east-west route to central London, which is also a major shopping destination, carries up to 3,000 vehicles per hour in parts and about 120,000 pedestrians during shopping hours on weekdays³⁶. The scheme that has been implemented has, among other things, removed pedestrian guardrails and all but the most necessary street clutter, straightened kerb lines and provided more cycle parking.

While the scheme has rejected conventional wisdom that vehicles and pedestrians must be segregated for safety reasons, injury accidents have fallen by 43 per cent, compared with 17 per cent for London as a whole

in the same period³⁶. Even so, other local authorities may be reluctant to pursue similar schemes due to fear of legal action if accidents occur.

It may be necessary, therefore, to provide new guidance and support to local authorities to enable them to pursue shared-space schemes with confidence. Meanwhile, there should be a freeze on the installation of conventional traffic calming schemes and the funding arrangements that encourage them.

Planning restrictions on parking provision

Until the mid 1990s, local authorities had generally insisted that new housing and commercial developments should provide enough off-road parking spaces to ensure that parking did not spill over into the street. This changed when new government guidance placed maximum limits on parking spaces, in an attempt to reduce car use. All this has achieved, however, is to increase on-street parking problems.

It is only necessary to visit a residential area where the houses date from the pre-war or immediate post-war era, when no allowance was made for car parking, to see that lack of off-road parking space does not deter residents from owning cars. Indeed, one of the greatest challenges facing local highway authorities is trying to manage the limited kerb space in these areas, as car ownership grows and residents expect to be able to park outside their homes.

Restricted parking provision at places of employment and retail developments have little deterrent effect on people driving to them. If there are not enough parking spaces, they simply park in adjacent roads. Highway authorities tackle this by introducing waiting restrictions, which may inconvenience residents and lead to them being forced to pay for parking permits.

There are signs that government policy may be changing. From April 2007, new planning guidance on residential developments removes all reference to car parking standards, and a report to the Treasury recommends a similar approach for new commercial developments³⁷.

While the removal of upper limits to car parking provision is welcome, developers will not wish to allocate more valuable land to 'unproductive' uses than necessary. Market forces may deter developers from trying to get away with providing too few spaces, but local authorities should be required to ensure that planning applications include sufficient parking provision for the level of demand that realistically can be expected. This may require the reintroduction of minimum parking standards.

Road user charging

Charging drivers directly for the use of roads is a concept that goes back centuries, to the turnpike era. More recently, specific infrastructure improvements such as river crossings and the M6 Toll Road have been funded by tolls levied on those using them. The London Congestion Charge is the only area-wide system of road user charging in the UK at present, but this just applies a daily flat-rate fee for entering the controlled area. A national system of charging road users according to distance travelled and time of day is now under active consideration by the government.

The idea that congestion can be reduced by charging drivers according to how they use the roads may be intellectually attractive, as it appears to bring market forces to bear in controlling demand for the use of limited road space. Those who support the concept, however, have clearly not thought through the practical or political implications of how it would work in the real

world.

A national road user charging scheme would most likely be based on satellite tracking technology, with real-time information on every journey transmitted continuously to a central processing office, where charges would be calculated. Drivers would be invoiced at regular intervals. In a free, democratic society, the objections to monitoring and storing the movements of tens of millions of citizens should be self-evident; although there has been surprisingly little publicity for – or reaction to – the network of number-plate recognition cameras set up in 2006 by the Association of Chief Police Officers, with government backing, to create a database of vehicle movements. Around 35 million number-plate ‘reads’ are being stored each day and will be kept for two years initially, rising to five years eventually³⁸.

The civil liberties issues alone would be sufficient for many people to reject the invasion of privacy that continuous tracking of vehicles represents. However, for now we will concentrate on the practical questions of whether road user charging is actually capable of producing an improvement in conditions on the road network.

Even among the supporters of road user charging there is some vagueness about what it is meant to achieve. Is it to influence drivers’ choices of route and time of travel, in order to make more efficient use of the road network? Or is the intention to reduce traffic levels overall? There are those who advocate reductions in existing motoring taxes, such as fuel and vehicle excise duties, to compensate for the extra road user charges, while others wish to see road user charging applied on top of existing taxes.

If the intention is to encourage better use of the road network, it must not be forgotten that congestion itself influences the choices that drivers make. People have different levels of tolerance to sitting in traffic jams, but there will be a point at which each individual will find another route, change their time of travel, go to another destination, or decide not to travel at all. This point comes when the value of the trip to the individual is exceeded by the perceived ‘costs’, which will not all be monetary. The value of a trip will also depend on its purpose: a journey to work is likely to be given a higher value than a leisure trip, for example.

Congestion is to a large extent self-regulating, therefore, as a result of the sum total of the choices made by individual road users. Road user charging seeks to influence those choices. The basic idea is that drivers would be charged different rates per mile depending on the level of congestion on particular roads at different times of the day.

Let us see how this might work by considering a morning or evening weekday ‘rush hour’, when congestion is usually at its worst. Charges would be set initially on the basis of pre-existing congestion levels, with higher charges on the more congested roads. Some drivers would decide to switch to roads with lower charges, thus increasing traffic levels on those. (This also has potential road safety implications, if drivers are encouraged to divert from motorways to all-purpose roads, for example.)

Consequently, the initial charging regime would change congestion levels across the network, so the charges would need to be recalculated. These new charges would lead to further traffic diversions, requiring the charges to be adjusted again. This iterative process could continue over a period of weeks or months, until a stable situation was achieved. In all likelihood this would be little different from the traffic pattern before charging commenced – but with the addition of a massive and expensive bureaucracy.

Any suggestion that road user charging could be introduced without an overall increase in taxation on drivers is absurd. It is inconceivable that the Treasury would tolerate a loss in overall revenue, so the maximum reduction in existing taxes from which drivers could benefit would be equal to the net income from charging, after the costs of running the scheme had been deducted. In other words, drivers would pay, at a minimum, the costs of operating the charging scheme, in addition to existing levels of motoring taxation.

The financial performance of the London Congestion Charge is not an encouraging pointer for a possible national scheme. In the four financial years 2002/03 to 2005/06, the London scheme generated £677.4 million in gross revenue, but net income was just £189.7 million after deducting running costs³⁹. Experience of other large government projects also suggests that massive cost overruns are the rule rather than the exception.

So a national road user charging scheme would inevitably result in an increase in taxation on drivers overall, whether that was the intention or not. Some advocates would welcome this as a way of discouraging 'non-essential' trips, but what gives someone the right to say that another person's journey is not necessary? It should be obvious that no one sets out to drive in congested conditions for fun. Many of the trips that take place during peak periods are journeys to and from work, so it may not be possible to change them, at least in the short term.

Another issue of concern is how drivers would be made aware of the costs they were likely to incur before beginning their journeys. Not only would they need this information so that they could make informed choices, it is fundamentally unjust for people not to know what their decisions will cost them until after the event. The more complex the charging system, the more difficult it would be to publicise and for drivers to understand – even more so if the charges had to be changed once the initial impact became apparent. On the other hand, if the charging regime were made so simple that it was easy to understand, it would be too crude to reflect the complex conditions on the road network.

If road user charging were to greatly increase overall costs to drivers, it would disproportionately affect those on low incomes. Wealthier drivers might even welcome the scheme, if charges were set at such a level that traffic flows fell significantly. Experience of fuel price increases suggests that they have little effect on traffic levels, so reducing congestion by fiscal measures would probably require very large increases in motoring taxation, through road user charging or otherwise. Any such policy would increase social inequalities.

So if road user charging is not the answer to congestion, what is? We will now look at the alternatives.

Alternatives to road user charging

Congestion can be reduced by increasing the supply of road space, reducing the demand for road travel – or a combination of both. It has become fashionable to reject road building because of the claim that new roads fill up with traffic. As we saw in the introduction, however, traffic growth is linked to economic prosperity, not investment in the road network. As further evidence of this, between 1994 and 2004 the total length of the UK's road network grew by less than one per cent, and the motorway network by less than 9 per cent⁴⁰. In the same period, traffic levels overall grew by 18 per cent and motorway traffic by 37 per cent⁴¹.

The belief that Britain is being covered by roads is demonstrably false. Roads cover less than one per cent of the country and the density of the motorway network in 2003, expressed as

kilometres of motorway per thousand square kilometres of land area, is only half that of Germany and around 15 per cent below the EU average². In relation to the size of its economy, the UK's motorway network is woefully inadequate: with fewer than 2 kilometres of motorway for every billion dollars of GDP in 2003, it is less than half the EU average².

It is hardly surprising, therefore, that Britain suffers from traffic congestion. While major road building in urban areas is neither feasible nor desirable, the inter-urban main road network requires significant improvement. In particular, there are several regions of the country that are not even connected to the trunk road network by a dual carriageway, let alone a motorway. Overloaded single carriageway roads lead to slow and unreliable journey times, and often have a poor safety record as a result of driver frustration. Many towns and villages on these roads suffer from through traffic that should have been diverted to bypasses long ago.

It is clear, therefore, that extra investment in the motorway and trunk road network is essential and should be a priority for an incoming Conservative government. As well as additional funding, the planning process for new road schemes needs to be reviewed to see how it can be speeded up. One possible area of improvement is the level of compensation provided to those whose properties are affected; another is an insistence that a high degree of environmental protection is built into scheme designs from the outset. If the time wasted at planning inquiries could be reduced and schemes completed sooner, the extra costs would be offset by the earlier benefits of faster, more reliable journey times and fewer accidents.

A review of the planning process should also scrutinise the role of the regional assemblies. Despite the electorate of the North East overwhelmingly rejecting this extra tier of government, unelected and unaccountable regional assemblies have been created throughout England. They have the power to decide transport priorities in the regions, which may differ from those of the elected local authorities. An example was reported in 2005 in the South West⁴², where inter-urban road improvements proposed by the six county councils were rejected by the regional assembly, in favour of urban transport schemes.

While it will clearly be impossible to reduce traffic congestion in the UK and maintain economic prosperity without some significant investment in new roads, there are ways in which demand could be reduced without taking road space from drivers or increasing the financial penalties on them.

Attempts to solve transport problems usually involve changes to transport policies alone. This narrow approach ignores the impact that policies across the whole range of government departments can have on the demand for travel. As an example, we will look first at journeys to work, one of the main contributors to congestion.

With the increasing pace of technological advance, most people will have to change jobs, or even careers, several times during their working lives. But with 70 per cent of dwellings owner-occupied⁴³, the cost and difficulty of moving house can be a major disincentive for people to relocate close to a new place of employment. One of the main costs associated with moving house is stamp duty. The high rate and non-progressive nature of this tax means that many people seeking to move house in the most congested areas of the UK – like the South East – are faced with a tax bill upwards of £7,500.

On top of that, the lack of effective sanctions to deter irresponsible buyers from causing the collapse of house-buying 'chains' causes a great deal of stress and extra expenditure. As a

result of these and other factors, by 2006 home-owners were moving house only once every 15 years, compared with every 10 years in the 1980s⁴⁴. Rather than move house, many people would prefer to spend the money saved on improving their existing homes – and tolerate a longer drive to work. A reduction in stamp duty and a review of the regulations governing house sales could help to reverse this trend and ease peak hour congestion.

Another factor affecting people's reluctance to move house is the availability of schools of an acceptable standard. Indeed, houses in the catchment areas of the best schools often command a price premium. The failure of successive governments to raise the standard of all state schools to the level of the best is a factor that contributes to 'school run' traffic, as well as a deterrent to moving house when changing jobs.

The amalgamation of services in pursuit of efficiency, such as concentrating NHS facilities at fewer, larger hospitals, also increases the need to travel. The transport implications of such decisions should be given greater consideration than at present.

Other ways in which the need to travel could be reduced include encouraging more people to work from home, at least part of the time. The trend towards teleworking is already gathering pace, with around 2.4 million people working mainly from home in 2005, an increase of 1.5 million since 1997⁴⁵. Over 60 per cent of teleworkers are self-employed and 36 per cent are employees, but the latter represent only 4 per cent of all employees. To increase this figure, employers could be given tax breaks to encourage teleworking, and it may be necessary to review employers' health and safety responsibilities for employees working in their own homes.

Given the political will and imagination, there are ways in which the need to travel – and traffic congestion – can be reduced without demonising drivers.

Chapter 3

Keeping traffic moving

As we have seen, avoidable congestion and traffic delays are caused by a range of government policies. These include: failure to increase road network capacity to meet the needs of economic growth; taking road space from cars and goods vehicles; and intrusive traffic calming schemes.

In addition, drivers often suffer excessive delays and disruption due to mismanagement of road works and in dealing with accidents. Utility companies repeatedly dig up roads and reinstate them badly, with little effective control of their activities. Tolls at the Dartford River Crossing continue to be levied despite the financial targets having been met, causing unnecessary delay on the approaches to the toll booths.

Schemes that adversely affect drivers, such as bus lanes, traffic calming, lower speed limits and banned turns, are usually introduced with the bare minimum of publicity, ensuring that few people are aware of the proposals until they are a fait accompli. In many towns, there is poor signing to the locations of car parks and no indication of the numbers of spaces available. This leads to drivers adding to congestion as they find somewhere to park.

It is these issues to which we will now turn our attention.

Road works

According to the Highways Agency⁴⁶, road works cause 10 per cent of the congestion on motorways and trunk roads, with accidents responsible for 25 per cent. These sources of congestion are unpredictable and can badly affect anticipated journey times. It is essential, therefore, that the delays caused by them are minimised as much as possible.

In the case of road works, their duration could be reduced if work continued around the clock instead of being restricted to a single daytime shift on five or six days per week. In many cases, they could also be speeded up by deploying more workers and equipment, so that work proceeded on more parts of the site at the same time. By completing road works in a shorter period, not only would the disruption suffered during periods of peak traffic flow be over more quickly, drivers would not be subjected to prolonged restrictions at other times.

Accelerating road works by applying more resources would obviously increase costs. The planning of road works includes an economic assessment that attempts to minimise overall costs, including capital expenditure on the scheme and the monetary value of delays. Except on the busiest roads, however, these calculations lead to methods of working that put saving money before the inconvenience caused to road users. The assumptions made in these economic assessments need to be reviewed and a much greater value put on travel time, to reflect the disproportionately adverse effects that unforeseen delays have on travellers.

Other aspects of road works management also cause unnecessary delays to drivers.

Temporary speed limits are often introduced to reduce the risk to workers from passing traffic, but they usually apply around the clock – often enforced by speed cameras – even if work is only being carried out for a few hours per day. Unless there are good reasons for speed restrictions in addition to protecting the workforce, such as narrow lanes or a contra-flow in operation, temporary speed limits should be lifted when work is not taking place. This would, of course, mean additional effort to remove or cover the signs, but failure to do so is an indication of the low regard in which highway authorities hold their 'customers'.

Another example of the same attitude is the tendency to restrict a long stretch of road, while only working on a short part at a time. It is not unusual for several miles of road to be subject to temporary speed limits and lane closures, with activity taking place on only a few hundred metres. Again, it is cheaper and easier to set up the signs and cones only once, rather than move them along as work progresses. However, this is a cause of immense frustration, as well as delay, to drivers. Limits should be set on the maximum length of road that may be subject to restrictions before and after an active road works site.

The Traffic Management Act 2004 should be reviewed to ensure the independence and authority of traffic managers, who should have a duty to minimise delays to road users arising from road works. Planned road works should be submitted to traffic managers for scrutiny, to ensure that proposed restrictions are reasonable and that numbers of staff and plant, and hours of working, will be sufficient to complete the works as fast as reasonably possible.

Dealing with accidents

Severe disruption can occur when roads, especially trunk roads and motorways, are closed for long periods following accidents. As well as the costs resulting from these delays, traffic diverting to other, less safe routes can lead to additional accidents occurring elsewhere. Some disruption is inevitable during rescue operations and the removal of vehicles, and the safety of emergency services' personnel at the scene must be paramount. Once the location has been made safe, however, traffic must be allowed to flow as soon as possible and traffic managers should ensure that this happens.

Extended closures or restrictions while the police gather evidence for possible prosecutions must be curtailed. The police regard any accident location as a potential crime scene, and reopening the road is not a high priority for them. They should be encouraged to find ways of recording physical evidence more quickly.

The possibility should be considered of imposing financial penalties on highway authorities if roads remain closed after they have been made safe following accidents. This would encourage highway authorities to put pressure on the police to complete their investigations as quickly as possible. It may be necessary to set up procedures requiring traffic managers to submit regular reports on incident management to the Secretary of State, who would decide whether any penalties should apply.

A dedicated telephone number could be considered for road users to contact a traffic managers' call centre, to report delays and obtain information about the reasons for them.

Road works by utility companies

Road works carried out by power, gas, water and telecommunications companies when they install, maintain or replace their equipment are a major cause of traffic disruption, especially in urban areas. The New Roads and Street Works Act 1991 places requirements on utility

companies to give notice to the highway authority before carrying out works, and to comply with conditions imposed by the authority. These can include restrictions on hours of working in busy roads, and highway authorities have a duty to coordinate the works of different utility companies, so that roads are not dug up repeatedly.

There are also provisions about acceptable standards of reinstatement of the road or footway when the work is complete, and highway authorities are empowered to carry out inspections and require sub-standard work to be rectified by the utility companies. In certain circumstances, highway authorities can rectify the work themselves and reclaim the costs. When defective work has to be put right, however, it means further disruption to road users.

The degree to which the Act has achieved its objectives varies a great deal across the country. Some utility companies take their responsibilities more seriously than others and highway authorities vary in the rigour with which they apply their powers. One of the difficulties faced by highway authorities that do try to enforce the Act is the low level of penalties for non-compliance. The Traffic Management Act 2004 strengthened some of the regulatory provisions of the 1991 Act and raised many of the penalties from a level 3 fine (£1,000) to level 4 (£2,500) or level 5 (£5,000). Even so, these sums are small in comparison with the turnovers of most utility companies, so they may not represent an effective deterrent.

There is a need, therefore, to review the working of the legislation on road works carried out by utility companies, to see how it can be made more effective. This might include raising the penalties for utility companies that repeatedly fail to comply with the legal requirements. It might also require highway authorities to provide regular reports to the Secretary of State on the way in which they are applying their powers and meeting their responsibilities under the legislation. This could be another duty of the traffic manager.

Dartford Crossing tolls

The first Dartford Tunnel joining Essex to Kent opened in November 1963 and the second in May 1980⁴⁷. Tolls have been levied on users of the tunnels from the outset, although the relatively low traffic flows in the early years produced barely enough toll income to service the construction cost debt.

With the building of the M25 and the general growth in traffic levels, it quickly became obvious that the twin 2-lane tunnels would not be adequate to link the two ends of a dual 3-lane motorway. In 1988, therefore, the Dartford-Thurrock Crossing Act authorised the construction of the Queen Elizabeth II Bridge, to the east of the tunnels. The bridge opened to traffic in October 1991 and carries four lanes of southbound traffic, with the tunnels providing four lanes for northbound vehicles.

The 1988 Act provided for tolls to be levied for a maximum period of twenty years, but they were to be removed earlier once the construction costs were repaid and a fund built up to cover future maintenance. With completion of the M25 and the continuing growth in traffic, the income received from tolls was approaching this point by 2001.

The government decided, however, that the income from the tolls was too valuable to lose, so in 2002 it made an Order⁴⁸ to continue the tolling regime indefinitely, under the powers conferred by the Transport Act 2000. Not only does this mean that drivers are continuing to pay to use the crossing, contrary to the explicit intention of the original legislation, but they continue to suffer unnecessary delays while queuing to pass through the toll booths. Those delays can be

substantial.

This is a prime example of the government's contempt for drivers – obstructing their progress while making them pay for the privilege. The original promise should be honoured and the tolls removed.

Notification of proposals affecting drivers

Many regulations and controls affecting drivers, such as local speed limits, bus lanes, waiting restrictions, road closures and banned turns, are only enforceable if they are supported by a traffic regulation order. Before such orders can be made, the traffic authority is legally required to consult those affected and give proper consideration to any objections received. Consultation must also take place before road humps are installed, even though these do not require a traffic regulation order.

The legal requirements governing the consultation process⁴⁹ are inadequate to ensure that those affected by proposed restrictions are made aware of them. The only absolute requirement in most cases is that a notice must be published in one local newspaper. These notices are usually tucked away, far from the editorial pages, and are rarely read by anyone. Traffic authorities are also required to take such steps as they consider necessary to ensure that people affected are made aware of the proposals, but this is open to varying interpretations.

Most authorities will attach notices to lampposts or other street furniture in the area of the proposed restriction; some will deliver letters to residents and businesses. While these actions may give people living in the area an opportunity to find out what the authority intends to do, they are of no help to drivers who use the road but live elsewhere. Site notices are usually of A4 size and display a copy of the formal newspaper notification. They are unreadable from a moving vehicle and it may be neither practical nor safe for a driver to stop to read them.

Consequently, the first time that most drivers become aware of a proposal that affects them is when it comes into force. By that time, the opportunity to object has passed. This can mean that badly conceived restrictions or traffic calming schemes are introduced without the people most affected by them having any say in the matter.

Stronger guidance needs to be given to traffic and highway authorities on ways of ensuring that drivers, not just local residents and businesses, are made aware of proposals that would affect them. This is especially important where proposals affect roads that are significant traffic routes, and do not just provide local access – a better balance needs to be achieved between the needs of road users and those of residents.

One possibility would be to display notices of a size capable of being read from a moving vehicle, with a simple message stating that a new restriction (e.g. speed limit) is proposed and giving a telephone number where details can be obtained. People who phone the number should be given the opportunity of being sent a copy of the official notice and an explanation, in plain English, of what it means.

Where restrictions or traffic calming schemes have been introduced and prove to be unpopular, either because there was inadequate awareness of the proposal or its effects were not properly explained, it can be very difficult for road users or residents to have the scheme changed or removed. A requirement should be placed on traffic and highway authorities to consult all people affected by such schemes on whether they should be retained, if requested to do so by

a minimum number of people.

Public car park provision

The economic viability of town centres depends to a large extent on the ease with which people can get access to them for shopping or personal business trips. While some will find walking, cycling and public transport convenient, for many people these are not practical options. For town centres to thrive, therefore, adequate and attractive car parks are essential.

Even where parking facilities are sufficient, there is often inadequate signing to them for the occasional visitor. When drivers succeed in finding a car park, it may well be full. They then either wait for a space to become available, or go in search of another car park; either way, they add to traffic flow and congestion. Local authorities should be required, therefore, to provide adequate direction signs to car parks. Where possible, car park occupancy should be monitored, enabling greater use of variable message signs that indicate whether car parks are full or have spaces free.

Government funding that is currently provided for schemes such as bus lanes and traffic calming should be used instead for constructing new public car parks where needed or improving existing ones, to high standards of design and security. Car parking charges should not be used to subsidise other local authority services and financial regulations may need tightening to prevent this.

Chapter 4

Effective road safety policy

Britain has long had an enviable road safety record internationally. That is still the case, but in recent years the UK's record, measured by road deaths per 100,000 population, has improved much less than that of several other developed countries⁵⁰. As we saw in the introduction, the number of people killed in road accidents per year more than halved between 1965 and 1994, but only fell by a further 7 per cent over the following eleven years.

The reduction in road deaths during the 30-year period from the mid 1960s can be attributed to several factors, but the dominant ones are better vehicles and better roads. Improvements in vehicle engineering have made it easier for drivers to avoid accidents in the first place (active safety) and reduced the risk of injury to vehicle occupants and other road users when an accident does occur (passive safety). Motorways and dual carriageways, with their limited access and elimination of conflicting turning movements, have a much lower accident rate than all-purpose roads. Development of the trunk road network, therefore, has helped reduce accidents, as well as benefiting the economy. Many accident hotspots have been eliminated by small-scale road engineering schemes.

So what has happened since the mid 1990s to slow the rate of improvement? Vehicle engineering has continued to make great strides, in both active and passive safety. New cars today are almost universally fitted with anti-lock braking systems, and traction and stability controls are becoming more common. Improvements in passive safety include more effective crumple zones and the widespread fitment of air bags. Vehicle designs are also taking more account of the need to minimise injuries to pedestrians in the event of a collision.

It is a different story with the road network. In 1965 there were 566 km of motorway in Britain and this figure had risen to 3,242 km by 1994. Since then, less than 300 km have been added⁴¹. This failure to invest adequately in the national road network is undoubtedly a factor in the reduced rate of fall in road deaths, as traffic levels continue to rise on roads with accident rates higher than those of motorways and dual carriageways. Much of the funding that would previously have been spent on improvements to high-risk accident locations is now allocated to schemes that obstruct drivers or take road space from them.

Reduced investment in the road network is unlikely, however, to be the only factor – or even the main one – affecting road safety in the last decade. To understand why, we need to consider why Britain has historically had a better road safety record than most other countries. It cannot be due to differences in the vehicle fleet, since most cars in use around the world are made by the same multi-national companies. Nor is it due to the UK having a better road system since, as we have seen, most other developed countries have more extensive motorway networks.

The main reason for international differences in accident rates is probably cultural, demonstrated by different attitudes between countries towards road safety. These differences are impossible to quantify, but Britons have traditionally shown respect for others and for the

rule of law – provided that laws, and their enforcement, are seen as just and reasonable. Since the mid 1990s, however, enforcement of road traffic laws has focused increasingly on those offences, such as speeding, that are easy to detect. At the same time, many new restrictions have been introduced, including lower speed limits.

These developments, coupled with use of the latest enforcement technology, have led to an explosion in the numbers of drivers being prosecuted. This has resulted in increasing resentment by drivers penalised for what are often seen as ‘technical’ offences, especially since the camera partnerships were established. With the partnerships being funded by the income from fines, it is hardly surprising that speed limit enforcement is often seen as just a money-making exercise.

The narrow focus on speed and speed limit enforcement over the last decade has done a great deal to undermine respect for traffic laws and to damage Britain’s road safety culture. Before we examine these issues in more detail, it is first necessary to look at the reliability of the figures used to monitor trends in road safety – casualty statistics.

How reliable are casualty figures?

Since casualty figures are used to measure the effectiveness of road safety policies, it is vital that they are reliable – and consistent. The number of people killed in road accidents each year has traditionally been seen as the indicator of the national trend. An accident is classed as fatal if someone dies within 30 days. While this definition provides some small room for error in compiling the figures, they are generally accepted as accurate. The fatality figure is also the only one that can be used to give a realistic international comparison, since the level of reporting of less severe accidents varies widely between countries.

In 2000 the government set new targets for road casualty reductions to be achieved by 2010⁵¹. Instead of setting a separate target for fatalities, however, the targets now are to achieve reductions in the combined totals of killed and seriously injured (KSI) casualties.

The use of fatality figures as a measure of road safety performance can be problematic when looking at small geographical areas or individual road improvement schemes, since fatalities are, thankfully, rare. This means they can be subject to large random variations from year to year. With roughly ten serious injuries for every fatality, the use of combined KSI figures should, theoretically, provide a more reliable measure of road safety trends.

In practice, by combining serious injuries with fatalities, the figures are susceptible to under-reporting of non-fatal injury accidents. Official figures for road accident casualties are compiled from police accident report forms. It has always been recognised that the police figures for serious and slight casualties do not reflect the total numbers. This would not be a problem in monitoring trends if the scale of the under-reporting remained constant over time. There is mounting evidence, however, that this is not the case and official figures are giving a distorted view of progress towards achieving the targets.

An analysis of historical accident data⁵² shows how the trend has changed. In 1950 there were just under 10 serious injuries for each fatality. By the mid 1960s, when accident numbers peaked, the ratio of serious to fatal injuries was over 12:1 and by 1985 it was nearing 14:1. These changes show fatalities falling as a proportion of the KSI total and are consistent with the improving passive safety of vehicles and advances in medical treatment.

Since the late 1980s, however, the trend has reversed and by 2004 there were fewer than 10 serious injuries recorded for each fatality – a level similar to 1950. This is illogical, given the continued advances in passive safety and medical care. It suggests that either under-reporting of serious injuries is getting worse or more injuries are being misclassified as slight instead of serious.

Two reports published in 2006^{53, 54} compared police figures for serious casualties with those derived from records of hospital admissions. These show that while the official figures, based on police reports, had fallen between 1996 and 2004 at an average rate of 4.4 per cent per year, those based on hospital records had fallen by just 0.2 per cent per year. If the hospital figures are correct, this means that the reduction in serious injuries over that eight-year period has been negligible, so claims by the government and casualty reduction partnerships that they are on course to meet their road safety targets by 2010 are unfounded.

Why are road safety policies failing?

With the exception of a tiny minority of people who commit deliberately reckless acts while using the roads, the majority of accidents are caused by human error; hardly anyone sets out with the intention of harming themselves or others. Despite this, road safety policy is largely focused on bringing legal sanctions to bear on those who break an ever-increasing number of rules and regulations. When an accident happens, police investigations are more concerned with the possibility of bringing criminal charges than to establish all the contributory factors and how similar accidents might be avoided in the future.

This is not a new phenomenon; it was the central theme of the seminal book on road safety *Road Accidents: prevent or punish?* by the late John Leeming, a former county surveyor and pioneer road safety researcher, published in 1969 and recently reprinted⁵⁵. Leeming argued that drivers involved in accidents are unlikely to be completely open with police investigators for fear of incriminating themselves. Factors that may have contributed to the accident, such as a confusing road layout, may go undiscovered, therefore, and lead to further accidents.

Hardly any accidents have a single cause; it invariably requires a combination of factors to come together for an accident to happen. As a simple example, if a driver fails to give way at a crossroads – either through inattention or a lack of adequate road signs – an accident will only occur if another vehicle is passing on the major road at exactly the same time. Even when the ‘cause’ of an accident appears to be obvious, there is often a more important underlying factor at work: if a driver enters a bend too fast and leaves the road, the accident will be attributed to excessive speed, but the real cause was the driver’s failure to read the road properly and make a correct estimate of a safe speed for negotiating the bend. The driver’s error may, in turn, have been due to inexperience, fatigue, or the road alignment being deceptive, such as the bend tightening part way round.

The causes of accidents, therefore, are not simple and neither can the solutions be. Yet the trend in road safety policy, especially in recent years, has been based on a simplistic view that punishing more drivers for infringing a greater number of motoring laws will somehow reduce casualty levels. It is clearly not working.

An example of the muddled thinking behind this legislative onslaught can be found in the Road Safety Act 2006, which creates a new offence of causing death by careless driving⁵⁶. It is claimed that this new offence is needed because of the difficulty of securing convictions for causing death by dangerous driving; the criteria that define careless driving are less onerous to

prove. This line of reasoning exposes the desire to seek retribution rather than to prevent accidents happening in the first place.

Even the best and most conscientious driver makes a mistake occasionally, but whether an accident results – and the severity of any injuries – depends on the chance of other factors coming together at the same time. So any driver could face a prison sentence if a simple human error leads to someone's death. It is absurd to believe that the threat from this new law and others like it can turn human beings into perfect drivers who will never make mistakes.

It is impossible to inadvertently commit a burglary or a robbery, but most road accidents are caused by errors rather than deliberate intent to do harm. While the worst forms of dangerous behaviour on the roads undoubtedly need to be dealt with through the courts, there needs to be a fundamental rethink of the extent to which the criminal justice system can be expected to improve the standard of the majority of drivers. As John Leeming observed, the greatest deterrent to having an accident is the accident itself. Of course, if a driver's mistake results in an accident, then those affected are rightly entitled to compensation through civil action.

Nowhere is the desire to seek easy convictions more obvious than in the enforcement of speed limits. Exceeding a statutory speed limit is a criminal offence, and modern technology enables speed limit offences to be detected and processed in large numbers with minimal police involvement. Yet the law on speeding requires a driver to walk a fine line between legal and criminal behaviour that is separated by as little as one mile per hour. This requires drivers to give a significant amount of their attention to monitoring their speed closely, distracting them from observing other things happening around them that may be more important to safety.

Speed limit enforcement has become a major growth industry in the last decade, not just by providing fine revenue for the Treasury but in supporting the growth of camera partnerships and the manufacturers of speed detection equipment. The focus on speed limits is justified by claims about the contribution of speeding to accidents, the reductions in accidents that lower speeds could bring, and the reductions that have been achieved by the use of speed cameras. We will examine the validity of those claims, after first showing how speed limits should be used in the pursuit of road safety and their effect on driver behaviour.

The value of speed limits

Apart from a brief period in the early 1930s, speed limits have been imposed on public highways in Britain for as long as there have been mechanically propelled vehicles. Their use is so well established that few people ever stop to consider their value as an aid to road safety.

It should be easy to see how a system of fixed speed limits has its limitations. Drivers are faced with constantly changing conditions as they travel along a road: changes in carriageway width, and in horizontal and vertical alignment; the presence of junctions, accesses and on-street parking; pedestrian and cyclist activity; all of these and more must be taken into account in selecting a safe speed at which to travel. On the same section of road, different speeds may be appropriate at different times of the day or night, on different days of the week and at different times of the year, and as weather conditions change.

Even where speed limits are set reasonably, therefore, they cannot provide more than an approximate guide to what might be a safe speed under average conditions: at some times or locations the speed limit might be too high; at others it might be too low. Furthermore, speed limits in Britain are set at round-number intervals of 10mph and, to avoid driver confusion,

frequent changes in speed limit are discouraged. Given all these factors, it is clear that speed limits are very blunt tools and drivers must not assume that it is always safe to drive up to them – equally it is fatuous to assert that it is always dangerous to exceed them.

Despite the limitations of speed limits, when set correctly they provide a positive contribution to road safety by guiding inexperienced drivers away from grossly exceeding safe speeds, by warning drivers of expected hazard density, and by providing a basis for enabling the police to prosecute those who drive at recklessly high speeds for the conditions. Recently, however, speed limits have become over-valued by assuming they can provide benefits far in excess of their capabilities.

Where speed limits are set they will always represent a compromise, so it is important that they are applied to lengths of road that are reasonably homogenous in character. These conditions are most often met in urban areas, where speeds themselves and the spread of the speed distribution are generally low. In rural areas it is rare for roads to have consistent characteristics, except in the case of purpose-built, modern motorways and dual carriageways. Most single-carriageway rural roads have frequently changing alignments, often with individual hazards (difficult junctions, sharp bends, crests, etc) joined by safer sections.

In these circumstances it is wrong to apply a blanket speed limit along the whole length of a road, on the assumption that it will reduce accidents at the hazardous locations: if the speed limit is set at a level dictated by the individual hazards, it will be too low on the safe sections. As explained below, this means it will be ignored by most drivers and the road will become more dangerous, not less. Similarly, if a limit is set that was reasonable on the safe sections, it could lead to the less experienced drivers *increasing* their speed through the hazardous sections; again, this would create more danger.

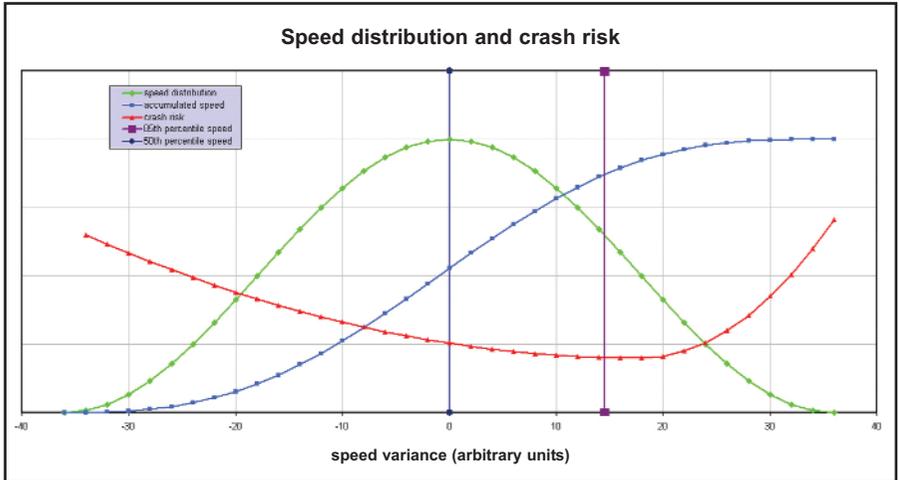
Accident locations on rural roads need to be treated with engineering measures tailor-made for those sites. These could include junction redesign, carriageway realignment, or additional signs and markings to warn drivers of the hazard; inter-active signs that light up when a driver approaches a hazard above a pre-set speed have been found by the Transport Research Laboratory to be very effective⁵⁷.

How speed limits affect driver behaviour

On any given stretch of road, drivers will travel at different speeds, and the spread of those speeds will take the form of a 'normal' distribution, as shown by the green curve in the graph over the page⁵⁸. The vertical line through the crest of the curve represents the 50th percentile speed (the speed below which half of drivers travel). Another vertical line, to the right of the graph, shows the 85th percentile – the speed not exceeded by 85 per cent of drivers.

The red curve shows the relative accident risk of drivers in relation to their speed within the speed distribution. This curve is based on the results of studies in various countries of speed and accident involvement⁵⁹. It can be seen that, contrary to what might be intuitively expected, accident risk does not rise in a simple relationship with speed but is actually lowest for drivers travelling in the 80th to 90th percentile speed range. At speeds above the 90th percentile, accident risk rises sharply, but it also rises at lower speeds and, indeed, the slowest drivers are at similar risk to the fastest.

It is because of these findings that the 85th percentile speed has long been recognised by traffic engineers as the optimum level at which to set speed limits. When speed limits are set in



accordance with the 85th percentile, it means that the majority of drivers, including the safest, are travelling within the law.

Speed limits based on the 85th percentile reduce the spread of the speed distribution, especially by reducing the number of drivers travelling at the highest speeds: since the speed limit has been set in accordance with the actions of the responsible majority, the remaining drivers are more likely to accept it as reasonable. The converse is also true: if speed limits are set below the 85th percentile speed, they are largely ignored, even by the safest drivers; the reckless minority then see that the limit has no respect among the majority of drivers, so they ignore it altogether. Thus speeds can actually increase when unreasonably low speed limits are introduced, and can decrease when speed limits are raised⁶⁰.

There are other adverse effects of unrealistically low speed limits. Those drivers who are fastidious about always obeying the law, no matter what, will create a queue of impatient drivers behind them. Eventually, frustration may lead to a driver attempting an unsafe overtaking manoeuvre, putting all road users at risk, including the law-abiding driver at the head of the queue.

The need for a driver to exercise judgement in adjusting speed to the prevailing conditions is one of the fundamental requirements of driving. Speed limits should be used to assist drivers in that task, not to take responsibility away from them. Overuse of speed limits carries the risk of drivers becoming reliant on external information for adjusting their speed, when the factors governing the safe speed under a particular set of conditions are too complex for any system of speed limits to replace a driver's judgement. This tendency towards 'driving by numbers' is eroding drivers' abilities.

The effect of speed on accidents

While the basic laws of physics dictate that, other things being equal, the higher the impact speed the more serious the consequences of an accident will be, this does not mean that higher speeds automatically lead to more frequent or more severe accidents. Drivers travel faster on roads with fewer of the hazards that provide opportunities for accidents to happen, such as junctions, bends and the dangers associated with built-up areas. At the same time, because there are fewer hazards, roads with higher average speeds have lower accident rates – motorways are our safest roads⁶¹.

Furthermore, except in rare cases – such as a driver falling asleep and crashing without taking any avoiding action – impact speed is not the same as approach speed. Nor is there any fixed relationship between the two speeds, since much depends on the alertness and responsiveness of the driver(s) concerned. For this reason, speeding campaigns are misleading when they quote the percentage of pedestrians killed if hit at various speeds: official casualty figures show that just 2 per cent of pedestrians died who were involved in reported injury accidents in 2005⁶², suggesting that actual impacts take place at well below approach speeds in most cases.

Despite the fact that roads with the highest speeds have the lowest accident rates, recent government policy on the setting and enforcement of speed limits is largely based on research by the Transport Research Laboratory (TRL) purporting to show that reducing average speeds can lead to fewer accidents^{63, 64, 65}. One of the most frequently quoted claims of that research is that a one mile per hour reduction in average speeds results in 5 per cent fewer accidents.

This and similar claims are based on comparisons of accident rates between roads claimed to be of similar type but having different average speeds. The fundamental problem with these comparisons concerns the reasons why roads should have different average speeds if they are, indeed, similar in all other respects. Either there are differences that have not been recognised, making the comparison invalid, or the roads have different traffic flows.

Accident numbers increase with traffic flow, but not in direct proportion. Thus the accident *rate* (expressed as accidents per 100 billion vehicle-kilometres) *decreases* with increasing flow. But speeds also decrease as traffic levels rise, so it is wrong to claim that decreasing accident rates are the result of lower speeds. Rather, both accident rates and speeds decrease as a result of higher traffic flows.

Evidence that the claimed relationships between average speeds and accident rates are flawed comes from the TRL itself. In a technical guide for road safety engineers, to help them decide which rural roads should be given priority for accident analysis⁶⁶, it is stated that, because the relationship between accidents and vehicle flows is not a linear one, roads with very different flow levels should not be studied together.

Belief in the discredited relationship between average speed and accident levels has led to many traffic authorities reducing speed limits, on the assumption that accident numbers will fall, regardless of their causes. The Department for Transport published new guidance on the setting of local speed limits in 2006⁶⁷, abandoning the 85th percentile as the basis of speed limit setting and replacing it with the mean, or average speed. This will result in many more speed limit reductions, with speed limits being set at a level below that at which the safest drivers would otherwise choose to travel. As a result, respect for speed limits will be undermined further.

The effect of speed limits on speed and accidents

There is a widespread misconception that reducing – or raising – a speed limit by, say, 10mph will result in an equivalent change to average speeds. As we have seen, however, drivers adjust their speed largely in accordance with visual clues to the level of danger ahead of them, and the most successful drivers in selecting a safe speed are those who travel in the 80th to 90th percentile range of the speed distribution. If the speed limit lies within or close to this range there will be a good level of compliance. If not, compliance will be low and there will be a greater spread of speeds, increasing accident risk.

Research suggests⁶³ that the change in average speed as a result of a change in speed limit will not be more than 25 per cent of that change, i.e. 2.5mph if the speed limit is raised or lowered by 10mph. Reducing speed limits does not, therefore, lead to equally lower speeds but results in increased non-compliance and lack of respect for speed limits generally.

The greatest opportunity in recent years to study the effects of speed limits on accidents arose with the repeal of the 55mph federal speed limit in the United States in 1995. From that date, individual states were free to raise their speed limits and many did so, increasing them to 65 or 75mph. The U.S. road safety lobby predicted thousands more road deaths annually, but analyses of accident figures^{68, 69} show that this did not occur. Indeed, many of the states that raised their limits saw greater reductions in accident rates than those that did not.

One U.S. state, Montana, went further than any other by abolishing daytime speed limits outside urban areas altogether, insisting only that drivers travel at a speed that was 'reasonable and prudent' for the conditions. This situation continued until 1999 when, under pressure from the U.S. Supreme Court, a 75mph speed limit was introduced on strategic routes and 65mph on other rural roads. During the period of no speed limit, road deaths on rural roads in the state fell to their lowest ever recorded, despite an increase in traffic volumes of more than 12 per cent⁷⁰. In the first year after the reintroduction of rural speed limits, fatalities rose by over 40 per cent.

The improvement in safety during the period of no maximum speed limit was most likely due to greater awareness and vigilance among road users, as responsibility for adopting a safe speed was passed back to drivers. With the reintroduction of speed limits, drivers once again felt absolved from that responsibility.

One of the claimed justifications for the massive increase in speed limit enforcement in recent years is that 'speeding' contributes to a significant proportion of accidents – a figure of one-third of accidents has been quoted frequently, and sometimes a higher proportion. There was never any hard research backing up these claims, which were also somewhat vague about the difference between exceeding a speed limit and driving at an inappropriate speed for the conditions.

Research published in 2006 on the contributory factors to road accidents⁷¹ at last made an objective assessment of the role of speed, both in excess of a speed limit and within the speed limit but too fast for the conditions. It found that exceeding the speed limit was a factor in just 5 per cent of all accidents and 12 per cent of fatal ones. Driving too fast for the conditions contributed to a further 10 per cent of total and 14 per cent of fatal accidents. It is clear that enforcement of speed limits does nothing to prevent accidents in the latter category.

The enforcement of speed limits

Prior to the authorisation of cameras for enforcement purposes, speed limits were enforced by police officers either at the roadside, using portable speed detection equipment, or by police traffic patrols. In virtually all cases, drivers were stopped at the time of an alleged offence and shown the evidence against them. This meant that there was rarely any doubt about who was driving at the time, and the driver would have a good idea of whether the claimed speed was accurate.

In law, a driver cannot be convicted of exceeding a speed limit on the evidence of a single witness⁷². When drivers are stopped at the time of an alleged offence, the primary evidence against them is the opinion of the police officer that they were exceeding the speed limit. The secondary evidence is the reading from an approved speed-measuring device.

The Road Traffic Act 1991 legalised the use of roadside equipment for the detection of traffic offences⁷³. The first speed cameras were installed in 1992 but, due to the high costs of camera installations, their numbers were restricted until the cost-recovery scheme was introduced nationally in 2001. This enabled camera partnerships (comprising police, traffic authorities and magistrates courts) to recover the costs of enforcement from the income obtained by issuing fixed penalty notices.

With unattended speed cameras it is impossible to stop a driver at the time of detection. A notice of intended prosecution is sent to the registered keeper of the vehicle, who is asked to provide details of the driver at the time of the alleged offence. The driver is then sent either a conditional offer of a fixed penalty or, if the measured speed is much higher than the speed limit, a court summons. Most mobile camera enforcement is processed in the same way, even when there is an operator present.

The move away from stopping drivers at the time of alleged offences, coupled with the financial incentives of the cost-recovery scheme, have led to erosion of the safeguards against drivers being wrongly convicted. There must still be two pieces of evidence that a driver was exceeding the speed limit: in the case of the familiar Gatso camera, the primary evidence is produced by a radar speedmeter; the secondary evidence comes from measuring the distance travelled between two photographs taken a known time apart. With attended mobile cameras, the primary evidence is still the operator's prior opinion of speed, backed up by the measurement of an approved device.

In their desire to process as many speeding tickets as possible, it is clear that the camera partnerships routinely send out notices of intended prosecution (NIPs) without checking the secondary evidence that would expose false speed readings. With mobile cameras, NIPs are sent on the basis of the secondary evidence alone, with no record being kept of the primary evidence against a driver – the operator's prior opinion of speed. Some partnerships allow civilians instead of police officers to operate mobile cameras, and some devices are operated at such long range that it would be virtually impossible for even an experienced police officer to assess a vehicle's speed by eye.

These practices show that the camera partnerships frequently breach the spirit if not the letter of the law in enforcing speed limits. In addition, a NIP arriving two weeks after the event does nothing to change a driver's behaviour in the intervening period, and the driver may well be unable to recall the circumstances at the time. It is often difficult for a driver to know, therefore, whether the claimed speed is accurate, or even who was driving. Camera partnerships often

refuse to acknowledge that there is a defence in law if a vehicle keeper cannot identify the driver at the time of the alleged offence⁷⁴, and some are reluctant to allow drivers to see the evidence against them unless they opt to go to court – and risk higher fines and increased penalty points if found guilty.

A further cause of resentment is the knowledge that drivers who have not registered their ownership of a vehicle with the DVLA cannot easily be traced and can offend with impunity. Such people are also more likely than most to drive vehicles that are uninsured or unroadworthy, or they may not have a driving licence. It is this irresponsible minority that the police should be targeting, but instead it is the generally safe and law-abiding drivers that are penalised by camera enforcement.

Given these injustices, there is a strong case for once again restricting speed limit enforcement to situations where the driver is stopped at the time by a police officer and shown the evidence against him or her. This would mean the end of speed camera enforcement in its current form and the mass prosecutions that go with it. By stopping a driver at the time, it is likely that the experience would affect the driver's future behaviour straight away. Also, the police would need to target their resources at sites where speeding was a proven factor in accidents.

The justification for allowing a massive increase in speed limit enforcement through the cost-recovery scheme was the claimed effectiveness of speed cameras in reducing speeds and casualties at camera sites⁷⁵. The claimed reductions in casualties, however, are largely illusory and are not reflected in overall casualty figures, either within partnership areas or nationally. To understand why this is so, it is necessary to examine the process by which speed camera sites are selected.

The Department for Transport issued rules and guidance for camera partnerships⁷⁶. These included criteria for site selection, including a minimum number of killed or seriously injured (KSI) casualties in a 3-year period and a measured 85th percentile speed that is substantially higher than the speed limit.

The first problem with these criteria is the nature of accidents themselves. These are random events, and the smaller the area studied the greater the chance variation in numbers from year to year. A site selected for camera enforcement on the basis of an upward blip in accidents will almost certainly see a reduction in accident numbers in following years, with or without a camera being installed. This effect, called regression to the mean, accounts for a significant proportion of the casualty reductions attributed to cameras⁷⁷.

We have already seen that the safest drivers travel in the 80th to 90th percentile speed range and that speed limits should be set as close as possible to the 85th percentile. If the measured 85th percentile speed is significantly higher than the speed limit, it is an indication that the speed limit is unnecessarily low at that point.

Speed camera 'sites' are not discrete locations but are lengths of road between 0.4km and 20km long⁷⁶. Since higher speeds are found on stretches of road with fewer hazards, a camera sited where speeds are highest is unlikely to be where most accidents have occurred. It is not forbidden for partnerships to site cameras in this way and many have done so, encouraged by the cost-recovery scheme. If cameras were only sited where it is always dangerous to exceed the speed limit, few drivers would be caught and the income generated would not cover the partnerships' costs.

Increasingly, the deployment of cameras along substantial lengths of road is justified by the claim that reducing average speeds will reduce accidents, regardless of whether excessive speed was a factor. As we have seen, the research on which that claimed relationship is based was intrinsically flawed.

Although the cost-recovery scheme for funding the camera partnerships does not apply from April 2007, the hardware, accommodation, processing systems and staff will still be in place and anxious to justify their existence. It is unlikely, therefore, that there will be any let up in the way cameras are used without a fundamental review of how speed limits are set and enforced, which should be a priority for an incoming Conservative government.

A new policy on speed limits and their enforcement

One of the first steps of a new government should be to withdraw the 2006 guidance on setting local speed limits and reinstate the 85th percentile principle. This should be included in new mandatory rules for speed limit setting, with which traffic authorities would have to comply. All local speed limits would need to be reviewed and brought into line with the new rules within a specified period of time, say five years. Traffic managers should be empowered to oversee these reviews and report progress to the Secretary of State.

The rules should include a ban on setting local speed limits on a general or whole-route basis on rural roads. Local speed limits should only be used to indicate a significant change in hazard density, not as a blanket approach to casualty reduction or to deter use of certain types of road. Individual hazards should be treated with engineering measures, or speeds reduced using methods such as vehicle-activated signs and psychological traffic calming.

In addition to local speed limits, some national speed limits need to be revised. The motorway speed limit of 70mph has been in force for over 40 years and 56 per cent of cars exceed it⁷⁸. The Transport Research Laboratory has calculated that the optimum speed for motorways is 78mph, balancing travel time savings against vehicle operating costs and accident costs⁷⁹. There should be an immediate increase in the national speed limit on motorways, therefore, to 80mph. The effect on actual speeds would be quite small, so increases in vehicle emissions or noise levels would be negligible. Raising the speed limit would bring it much closer to the 85th percentile, meaning that a far smaller proportion of drivers would be acting outside the law.

Other speed limits long overdue for review are those that apply to heavy goods vehicles on rural roads. These vehicles are restricted to 50mph on dual carriageways and 40mph on single carriageways. The 50mph limit is effectively redundant, as it is only 6mph below the governed maximum speed of the vehicles. The police are unlikely to enforce it, therefore, and 86 per cent of articulated vehicles exceed it⁷⁸.

The 40mph speed limit on single carriageways is also widely ignored, with 77 per cent of articulated goods vehicles exceeding it. Some camera partnerships are now using vehicle detectors to target heavy goods vehicles on roads where the national speed limit for cars is 60mph. Stricter enforcement of the 40mph limit would be detrimental to safety, as it would lead to long queues of cars stuck behind lorries, leading to frustration and potentially dangerous overtaking: far more car drivers will attempt to overtake a lorry travelling at 40mph than at 56mph. With the improved performance and braking abilities of modern goods vehicles, these differential speed limits are obsolete and should be scrapped.

Speed limit enforcement should be restricted to situations where the police stop (or attempt to stop) a driver at the time of an alleged offence. This would mean the removal of all unattended speed cameras, and mobile units could only be used in conjunction with a manned speed check. Where speed cameras are sited to reduce speeds on the approach to hazards, they should be replaced with vehicle-activated signs or other measures to slow drivers without prosecuting them after the event.

Since fixed speed limits make no allowance for varying levels of risk, it should be made easier to introduce variable speed limits in places where a low speed is appropriate only at restricted times, such as outside schools. For the same reason, the police should be encouraged and legally entitled to apply variable thresholds for deciding when to prosecute those exceeding speed limits. The guiding principle should be the promotion of road safety, not enforcement for its own sake.

Traffic policing should be made a core police function and the resources provided to enable an increase in patrols by trained traffic officers. Their purpose should be to set an example to other road users, to give guidance and advice to those who make minor errors – and to act as a deterrent to the unlicensed, uninsured or reckless minority.

Speed limiters

Speed limiters have been fitted to heavy goods vehicles, buses and coaches for several years, and their use is now being extended to smaller goods vehicles and minibuses. The devices currently in use are fairly crude and simply limit a vehicle's top speed to the maximum permitted for that class of vehicle anywhere, for example 56mph (90 kph) for goods vehicles over 7.5 tonnes. They have no effect, therefore, on a driver's control of the vehicle on roads with a lower speed limit.

A new form of speed control device, called Intelligent Speed Adaptation (ISA), is now being promoted as a possible fitment to all vehicles in the future. An in-vehicle 'black box' would contain a database of all the speed limits in the country, while GPS technology would track the vehicle's position and speed. If a driver failed to slow sufficiently when approaching a lower speed limit, the ISA device would react in one of three ways: remind the driver of the speed limit but take no action if the driver ignored it; control the speed of the vehicle to the speed limit by reducing engine power and applying the brakes, but with the driver being able to override the system; or control the vehicle's speed to the speed limit, with no override option.

The ISA system would affect a vehicle, therefore, at all times and in all speed limits. If used in advisory mode, it could be of some benefit, as drivers sometimes exceed speed limits inadvertently. Once such a system had been fitted, however, there can be little doubt that the override option would be removed. It has been claimed that the universal fitment of a mandatory ISA system could reduce injury accidents by 20 per cent⁸⁰. But this theoretical claim is based solely on the assumed relationship between average speed and accidents that we have already shown to be false.

It is also necessary to take into account the adverse effects that ISA could have on driver behaviour. The overuse of speed limits already has the subconscious effect on some drivers that they feel absolved of responsibility for choosing a safe speed, as the thinking has been done for them. By making it impossible to exceed speed limits, that effect would be much greater. Simulation trials have confirmed this, with those 'driving' an ISA-equipped vehicle being more prone to red-light running, driving too close to the vehicle in front, and driving too fast on

a foggy motorway, than when they have full control of the vehicle's speed⁸⁰.

It is only necessary to observe the effects on road behaviour of the speed-limited vehicles that already exist, to understand how disastrous the universal fitment of limiters would be. It is common to follow a lorry trying to overtake another on a two-lane dual carriageway or motorway. With a speed differential between the two vehicles of one mile per hour or less, other traffic can be held up behind the two-abreast convoy for several miles – with the following queue of vehicles invariably travelling too close together.

Even when they are not overtaking, headways between lorries are often dangerously short. Where a vehicle is able to travel only marginally faster than the one ahead of it, the driver will frequently wait until his lorry has almost caught the one in front before pulling out to overtake, to minimise the time spent in the outer lane. These short headways have the potential to lead to multi-vehicle accidents.

Also, in a vehicle travelling at a constant speed for long periods of time, boredom and fatigue set in and reduce a driver's ability to react to any unforeseen emergency, especially in light traffic conditions or at night. In extreme cases, a driver might fall asleep, leading to the vehicle leaving the carriageway. If cars were also fitted with speed limiters, ensuring that they all travelled at virtually the same speed, the problems would inevitably become much worse.

The proponents of ISA would doubtless argue that the headway problem could be overcome if vehicles were also fitted with a form of Adaptive Cruise Control (ACC), which senses the distance of a vehicle from the one in front and maintains a safe headway from it. But this would take even more control and responsibility away from drivers, reducing still further their ability to think for themselves. Research suggests that too many driver 'aids' lead to drivers becoming psychologically underloaded, reducing their ability to deal with an emergency situation⁸¹.

Rather than consider the further extension of speed limiters or the introduction of ISA, priority should be given to researching the adverse impact on road safety that speed limiters are having already. The use of technology should be limited to ways in which drivers can be helped to use the roads as efficiently and safely as possible, without taking control of their vehicles from them. It is these positive aspects of technological development that we will now consider.

Intelligent transport systems (ITS)

This is an umbrella term for technologies that can help drivers complete their journeys quickly and safely. It includes the provision of real-time information at the roadside, such as the variable message signs appearing on some motorways to warn of accidents or other delays, and details of spaces available in town centre car parks. Future developments could include feeding information on congestion to in-vehicle satellite navigation systems, which could then advise a change of route to avoid delays.

In terms of road safety, ITS has the potential to assist drivers provided it does not take away a driver's control of the vehicle. Most accidents are caused by road user errors and many of these are due to insufficient attention being given to the task in hand. In its research on contributory factors to road accidents, for example, the Department for Transport found that 'failed to look properly' was a factor in 32 per cent⁷¹. Canadian research into driver distraction found evidence that in almost 80 per cent of collisions, the driver looked away from the road ahead just prior to the onset of the crash⁸². The development of in-vehicle sensors that could monitor a driver's eye and head movements for signs of drowsiness or inattention, and give audible or visual

warnings, could therefore provide a valuable contribution to accident reduction.

Enforcement of waiting restrictions and other traffic regulations

The Road Traffic Act 1991 paved the way for local authorities to take over the enforcement of waiting restrictions from the police. Decriminalised parking enforcement (DPE) was initially introduced in London and has since spread to many other areas. The initial reason for giving enforcement powers to local authorities was that the police lacked the resources to enforce restrictions needed for safety reasons and to keep traffic moving.

The main objection to DPE in its current form is that each authority's scheme is required to be self-financing. This means that the income from penalty charge notices (PCNs) must at least cover the operating costs. As a result, enforcement priorities are governed by the need to issue the maximum number of PCNs rather than to achieve compliance with regulations where they are most needed. This has led to parking attendants often targeting minor technical infringements, rather than using their presence to deter obstructive or dangerous parking.

The Traffic Management Act 2004 has allowed local authorities to take over enforcement of some other traffic regulations, such as box junctions, banned turns and bus lanes, with increased use of camera evidence. Again, the proceeds from penalties issued are used to fund the enforcement operation, leading to over zealous targeting of minor infringements.

As well as leading to distorted priorities, allowing local authorities to keep the income from their enforcement activities results in a lack of impartiality when dealing with appeals against incorrect or unfairly issued penalties. Drivers may receive penalty notices as a result of errors by parking attendants or processing staff, through out-of-date or incorrect information on the DVLA database, or as a result of criminal activity such as 'cloning' of vehicle identities. Legitimate appeals in such cases are often met with hostility and drivers forced to prove their innocence – the complete opposite of natural justice.

To restore justice and fairness to the enforcement of parking restrictions and other traffic regulations, the financial incentives to issue more penalties must be removed. It is perfectly legitimate for local authorities to retain income from charges for services such as public car parking, but enforcement against evasion of such charges and breaches of other regulations must not be financed from the penalties applied. Instead, local authorities should be required to make an annual bid for funding to carry out enforcement to a level necessary to maintain traffic flow and safety, and to deter the avoidance of parking or other charges. The income from any penalties applied should revert to the Treasury, and there must be no targets set for the numbers of penalties to be issued.

Local authorities should also be required to review their waiting restrictions and the other traffic regulations that they enforce, to ensure that they are still needed for legitimate traffic flow and safety reasons. Any that are no longer justified should be removed.

Education and training

Of the 'Three Es' of road safety, education has long trailed behind engineering and enforcement in emphasis and funding, and is often treated as an afterthought. Yet it has the potential to deliver far greater improvements in casualty reduction than either of the other two.

The basic driving test in the UK assesses a driver's mechanical handling of their vehicle, knowledge of the Highway Code, ability to spot potential hazards, and completing a short test

route to the satisfaction of the examiner. All these are important, but the test does not assess the most important thing of all – attitude. Safe driving is essentially an exercise in continuous risk management, so the way a driver thinks is more important than how the car's controls are handled.

The overwhelming majority of road accidents are caused by human error on the part of one or more road users. Some of those errors are caused by lack of knowledge or experience, but many are due to distraction or inattention. To many people, using the roads is just a matter of getting from A to B and walking, cycling and driving are seen as secondary activities. As a result, people do not give them sufficient attention.

Road safety policies that focus on the enforcement of absolute laws create the impression that sticking to a few rules is more important than taking personal responsibility for minimising risk. There is little incentive to develop the attitude and approach to driving that enables the best drivers to complete their journeys in safety. Worse still, the implication that little effort is required to be safe on the roads reinforces the view that there is no need to give full attention to the task. Thus people can be led to believe that it is safe to use a mobile phone, shave, apply make-up, read, or eat and drink at the wheel – provided they do not break the speed limit.

There is no doubt that advanced driver training and testing significantly reduces accident involvement among those who undertake it. The Transport Research Laboratory found that drivers who passed the Institute of Advance Motorists' test had 25 per cent fewer accidents than those who failed it⁸³. One fleet manager recorded an 85 per cent reduction in accident rate among company drivers after implementing a driver training and risk management regime, and benefited from a 30 per cent cut in insurance costs⁸⁴. When advanced drivers do have accidents, they are less serious in terms of injuries and damage, are less likely to involve pedestrians or cyclists, and the advanced driver is less often at fault⁸⁵.

People who voluntarily take advanced driver training or testing are demonstrating that they have a responsible attitude to using the roads through their desire to improve their skills. Yet there is little incentive for the majority of drivers to take further training, apart from the possibility of a reduction in insurance premiums. Most people regard passing the standard test as the end of their driving education, when it should really be seen as just the end of the beginning.

One way of encouraging more people to take advanced driver training could be to introduce a system of positive points, which would be awarded to those who successfully complete approved training schemes beyond the standard driving test. The positive points would help offset any penalties incurred for minor offences, and more positive points could be earned throughout a driver's career for undertaking further training or retesting.

The most important action that government needs to take, however, is to abandon publicity campaigns based on misleading slogans such as "Speed Kills", which have caused so much damage to Britain's road safety culture during the last 15 years. Emphasis needs to be placed instead on the need for all road users to take responsibility for their own safety, and to accept that they cannot rely on others – or the law – to save them from their own mistakes. Everyone needs to be made aware that learning to use the roads safely is a vital life skill, not an optional extra. They should be encouraged to develop that skill to the best of their ability, so as to minimise the risks they pose to themselves and others. Above all, they need to realise that to be safe on the roads requires their full attention at all times.

This should not apply just to drivers but also to pedestrians and cyclists, who have been encouraged to think that it is entirely drivers' responsibility to avoid *them*. Over 80 per cent of pedestrian fatalities are precipitated by the pedestrian entering the road without due care⁸⁶. Some of those accidents could no doubt have been avoided if drivers had been paying more attention or driving more defensively, but the fact remains that *all* road users have a responsibility towards themselves and others when using the roads.

Instilling the right attitudes concerning road safety needs to start as early as possible, preferably in schools by increasing the road safety content of the Citizenship curriculum. But it cannot be emphasised too much that this must not mean brainwashing people, whether adults or children, into slavishly following simplistic rules; the road environment is too complex for that, and people have to think for themselves within a framework of basic principles. Education should focus on teaching those principles and the correct approach to individual risk management on the roads.

Road safety policies based on hectoring drivers and punishing them for breaking inflexible and often arbitrary rules cause great resentment. No one likes being patronised, or being treated like a naughty child, and the result is often the opposite of that intended. The driving public should be treated like responsible adults, which most of them are. Education campaigns should explain the real issues and not try to simplify them into misleading sound bites. Only then can we hope to see any real improvement in road safety in Britain.

Summary of recommendations

The recommendations in this report are summarised below. It is important that this summary is read in conjunction with the body of the report, so that the reasoning behind the recommendations is understood.

Road space

- All existing bus lanes should be reviewed to determine whether they add to the passenger carrying capacity of the road network. Those that do not should be removed or their hours of operation reduced. Proposals for new bus lanes should be assessed on the same basis.
- Most on-road cycle lanes in urban areas should be removed and cyclists encouraged to take extra training, to enable them to cycle with confidence in general traffic. More secure cycle parking should be provided at popular destinations to encourage cycling. Outside built-up areas, cycle tracks segregated from traffic should be provided where possible.

Traffic lights

- All traffic light installations should be reviewed to determine whether they are really necessary and whether their timings are set to maximise the capacity of the road network for all users. The requirement on local authorities to keep traffic moving freely must not be negated by an authority's other policies and objectives.
- Greater use should be made of part-time traffic lights where junctions can operate safely without them at off-peak times. Research should be undertaken into the practices of other countries, such as switching the lights to flash amber on all approaches, as adopted in parts of Europe.

Traffic calming

- There should be a freeze on the introduction of road humps and obstructive traffic calming schemes, and the funding arrangements that encourage them.
- New guidance should be provided to local authorities on alternative methods of reducing traffic speeds where necessary and improving the environment for all road users. Schemes based on the shared-space principle should be encouraged.

Planning restrictions on parking

- All remaining maximum car parking standards for new developments should be removed. The reintroduction of minimum standards should be considered, to prevent on-street parking problems arising from inadequate parking provision.

Road user charging and tackling congestion

- Proposed road user charging schemes would be regressive, would erode civil liberties, and would be largely ineffective in tackling congestion. They should be abandoned and alternative approaches pursued.
- The inter-urban motorway and trunk road network requires significant and urgent extra

investment to reduce congestion, improve journey time reliability, relieve towns and villages of through traffic, and cut accidents.

- Ways to speed up the delivery of new road schemes need to be investigated. These could include enhanced compensation for those adversely affected, and building in a high standard of environmental protection from the outset. The role of unaccountable regional assemblies in the planning process should be reviewed.
- Government policies in areas other than transport should be reviewed to see how they could reduce congestion, for example:
 - by making it easier for people to move home when changing jobs, through reducing stamp duty and reviewing regulations surrounding house sales;
 - by improving the standards of schools to reduce 'school run' traffic;
 - by reviewing centralisation policies in the provision of public services that create the need for longer journeys;
 - by promoting teleworking.

Delays due to road works

- Road maintenance and improvement schemes should be reduced in duration by working longer hours and deploying more workers and equipment. A much greater value should be put on the travel time of road users in economic evaluations of road works, to reflect the adverse effects of unforeseen delays.
- Temporary speed limits to protect the workforce should be suspended when work is not in progress, unless there are other safety considerations such as narrow lanes or a contra-flow in operation.
- The length of road subject to temporary restrictions at any one time should be limited in relation to an active road works site.
- Traffic managers should have a duty to minimise delays to road users arising from road works.

Delays due to accidents

- The possibility should be investigated of applying financial penalties to highway authorities if roads remain closed following accidents, once they have been made safe. Highway authorities would then be encouraged to put pressure on police to complete their investigations more quickly and find more efficient ways of gathering physical evidence.
- Traffic managers should prepare regular reports to the Secretary of State on incident management to monitor progress in reducing delays.
- Provision of a dedicated telephone number to a traffic managers' call centre should be considered, for road users to report delays and obtain information.

Road works by utility companies

- The legislation controlling road works carried out by the utility companies should be reviewed to see how it could be made more effective in reducing unnecessary delays to road users. Further increases in financial penalties may be required to ensure that the companies take their responsibilities seriously.
- The performance of highway authorities in enforcing the street works legislation might be improved if they were required to submit regular progress reports to the Secretary of State.

Dartford Crossing tolls

- Now that the capital costs have been paid and the maintenance fund established, tolls at the Dartford Crossing should be removed, as proposed in the original legislation

authorising construction of the Queen Elizabeth II Bridge.

Publicity for proposals affecting drivers

- New guidance should be provided to local authorities on ways of better publicising proposed restrictions that affect drivers. Publicity must extend to all regular users of roads, not just local residents. This could include a requirement for notices to be erected that can be read from a moving vehicle and direct drivers to a telephone number where further information can be obtained.
- Where restrictions or traffic calming schemes have been introduced and prove unpopular, highway authorities should be obliged to consult those affected on whether the schemes are retained, if requested to do so by a minimum number of people.

Public car park provision and signing

- Better signing should be provided to public car parks, including where possible the use of variable message signs to indicate numbers of spaces available, to cut congestion caused by drivers searching for somewhere to park.
- Funding currently provided for schemes that obstruct and delay drivers should be used instead to provide new and improved car parks, to high standards of design and security.
- Financial regulations should be tightened to prevent local authorities using parking charges to subsidise their other services.

Speed limits and their enforcement

- The 2006 guidance on setting local speed limits should be withdrawn and replaced with mandatory new rules, reinstating the 85th percentile principle for speed limit setting. Local authorities would be required to review their existing speed limits and bring them into line within five years. Traffic managers would be required to report progress to the Secretary of State.
- Local speed limits should only be used to indicate significant changes to hazard density and not on a whole-route or area basis.
- The national speed limit for motorways should be increased to 80mph.
- The 40mph and 50mph speed limits applying to heavy goods vehicles on rural single and dual carriageway roads should be scrapped.
- Speed limit enforcement should be restricted to situations where the driver is stopped at the time of an alleged offence. Fixed speed cameras on the approaches to hazards such as junctions and bends should be replaced with vehicle-activated signs, or other measures to slow traffic.
- The regulations for introducing variable speed limits should be relaxed, so that they can be used more widely in locations where a lower limit is required only at restricted times, such as outside schools.
- The police should be encouraged and legally entitled to apply variable thresholds when enforcing speed limits, to reflect changing degrees of risk.
- Traffic policing should be made a core police function.

Speed limiters and intelligent transport systems

- Research should be undertaken on the adverse effects on driver behaviour of the speed limiters currently fitted to some goods vehicle and coaches.
- Any form of technology that takes decisions away from the driver, such as intelligent speed adaptation in mandatory form, should be prohibited.
- Developments in intelligent transport systems should be focused on helping drivers avoid delays, and improving safety by monitoring drivers' attentiveness.

Enforcement of waiting restrictions and other regulations

- The income from penalties applied for breaches of waiting and other restrictions should no longer fund enforcement operations. Authorities should instead make an annual submission to finance the level of enforcement needed for traffic flow and safety reasons, or to deter the avoidance of parking or other charges.
- Local authorities should be required to review the restrictions they enforce, to ensure that they are still needed for legitimate traffic flow and safety reasons.

Road safety education and training

- Publicity campaigns suggesting that road safety is just a matter of drivers obeying simple rules should be replaced with ones that emphasise the need for all road users to take responsibility for their actions.
- There needs to be recognition that the right attitudes in road users are essential for safe use of the roads, and that unnecessary distractions should be avoided when driving, cycling or walking.
- Road safety education should start as early as possible and should teach the correct approach to individual risk management, based on people thinking for themselves rather than always expecting to be told what to do.
- To encourage people to take advanced driver training throughout their careers, a system of positive points should be considered, to offset any penalties incurred for minor offences.

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Experience:

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1991–2002, London Borough of Havering, Principal Engineer, then Transportation Planning Manager. Responsible for: production of annual Transport Policies and Programmes submission (superseded by Local Implementation Plan for Mayor of London's transport strategy); advising on transport policies; managing programme of local road safety schemes, traffic management schemes and reviews of waiting restrictions; liaison with other London authorities and government departments; preparation of reports to council committees.

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