

A review of the delivery of the Road Safety Strategy

Stage 1 Scoping Study.

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A review of the delivery of the Road Safety Strategy

This report aims to provide the Motorists' Forum with an assessment of factors and constraints influencing delivery of the road safety strategy, both now and up to 2010, and to outline key issues requiring further investigation in order to inform additional actions that should be taken by Government, local authorities, and others to strengthen delivery of the current strategy and to look beyond 2010.¹

The report begins by placing itself in the context of the Government's road safety strategy and targets for 2010, relevant aspects of the integrated transport policy and other government policies. It then addresses key aspects of delivery of the strategy by identifying a range of policies and measures that offer scope for appreciable acceleration in delivery. It goes on to outline the numerical basis for the targets and the basis in data and research for the strategy and for assessment of its implementation. Areas for further research are identified and recommendations for action are made. Supporting information and more detailed thinking about the future scope for casualty reduction are presented in appendices.

1 The context for this report

The principal aim of the Government's road safety strategy for Great Britain is to reduce death and injury on the roads, and the strategy has as its focus a casualty reduction target for 2010 (Department of the Environment, Transport and the Regions (DETR) 2000a).

The target is to reduce by 2010:

- the annual number of people killed or seriously injured (KSI) by 40 per cent;
- the annual number of children killed or seriously injured by 50 per cent; and
- the number of people slightly injured per unit of vehicle-distance travelled by 10 per cent;

compared in each case with the average for the years 1994-1998.

The two KSI targets are part of the Department for Transport 's (DfT) road safety Public Service Agreement (PSA) with the more recent addition of the need to tackle the significantly higher incidence of road safety problems in disadvantaged areas (DfT 2003a).²

The **road safety strategy** calls for many agencies and professions, motor manufacturers, business, road-user groups and the public to be committed to reducing death and injury on the road by working together and with central and local government in a wide range of ways. To this end it is presented in terms of ten themes, or areas of concern and action. These are:

- safer road use for children
- safer drivers - training and testing
- safer drivers - drink, drugs and drowsiness
- safer infrastructure
- safer speeds

¹ The original terms of reference for the review are in Appendix 1

² Section 3.1 and Appendix 3 contain information on the target setting process

- safer vehicles
- safer motorcycling
- safer walking, cycling and horse riding
- better enforcement of traffic law
- promotion of safer road use

The choice of themes is oriented towards the principal inputs to improvement of road safety and the outcomes for people who use the roads in different ways in order to encourage participation in the effort needed to implement the strategy. For each theme an action plan is presented, and these overlap in many ways in terms of the main actions by which it is envisaged that casualties will be reduced.

The Highways Agency is responsible for the motorway and trunk road network. It has its own Strategic Plan for Safety with its own casualty reduction targets to the year 2010 for motorways and trunk roads. They are to:

- reduce by one third the number of killed or seriously injured casualties; and
- reduce by 10 per cent the rate of slight casualties.

No additional target has been set for child casualties on the Highways Agency's network but measures for child casualty reduction on trunk roads are envisaged.

There are many other government policies which can have direct or indirect effects on the numbers of casualties on our roads, as outlined in Appendix 2, and many have associated targets and indicators that are currently being used to measure performance. This seems to produce a plethora of targets that can appear confusing at first sight until it is recognised that they are all pointing in the same direction of driving down the numbers of people killed or injured on the roads.

Road safety is only one of many objectives through which government, whether central or local, seeks to improve quality of life. Some other policies may conflict with that of road safety and some may act in synergy with it.

The white paper *A New Deal for Transport Better for Everyone* (DETR 1998a) signalled a change in transport policy with integration as the key concept. In terms of policies directly impinging on road safety this indicated that the government intended a shift in some journeys from car to a better public transport system, and to encourage more walking and cycling in a safer environment. The white paper also had as one of its core policies managing the existing road network to reduce congestion. There was also a major shift in transport funding arrangements for Local Authorities with the introduction of Local Transport Plans with five year indicative funding.

One implication for road safety is that in order to increase the amount of walking and cycling without increasing casualties the road environment must be made safer to accommodate these activities.

In the context of integrated transport the white paper set out a role for motorcycling:

“Mopeds and motorcycles can provide an alternative means of transport for many trips. Where public transport is limited and walking unrealistic, for example in rural areas, motorcycling can provide an affordable alternative to the car, bring benefits to the individual and widen their employment and education opportunities.

However, those riding powered two wheelers face the highest risk of death or serious injury of any group of road users and are a source of risk to pedestrians and cyclists. Increased motorcycling therefore reinforces concern for those put at risk by it.

The white paper makes it explicit that transport policy needs to balance safety with several other key objectives, notably economic competitiveness, access to activities, reduction of damage to the environment, and social inclusion - objectives which are sometimes in conflict. In particular, casualty reduction is not to be sought at the expense of opportunity to travel on foot or by bicycle or motorcycle.

2 Key aspects of delivery

The road safety strategy sets out a range of policies and types of measures that can contribute to the delivery of the strategy and the achievement of the casualty reduction targets for 2010, together with an implementation timetable including over 150 lines of action. From these the review team has identified for discussion here 14 key aspects which bear particularly directly upon the delivery of casualty reductions and may therefore offer scope for acceleration of delivery.

Three major considerations influence the strength and urgency of the case for taking forward a casualty-reducing policy or measure:

- cost-effectiveness, or performance according to a wider process of appraisal;
- acceptability in the eyes of the affected public, interest groups and key decision makers; and
- availability of financial and human resources or other prerequisites – notably parliamentary time.

Measures for which the resulting reduction in numbers of killed or injured can be estimated are susceptible to analysis of cost-effectiveness in terms of all the costs and benefits for which monetary values can be attributed. Various refinements in the way in which this is done are set out in Appendix 5, but the procedure remains straightforward for measures, such as many low-cost engineering schemes, whose only or overwhelmingly largest effect is casualty reduction. Some measures, such as more extensive engineering schemes, also have appreciable traffic and environmental effects, for some of which monetary values have not been established. Such measures should be subject to a wider appraisal of the kind that is applied to road construction schemes, and of which cost-effectiveness in monetary terms forms a part. For yet other measures, notably for those in the area of education, training and publicity, and for some types of enforcement, the resulting reduction in numbers killed or injured cannot be estimated, and decisions about their implementation are a matter of informed judgement by decision-makers.

Judgement is also needed in relation to acceptability to the public and to interest groups, and decision-makers need to be informed about these aspects of policies and measures, as discussed in Appendix 5.

Delivery of the road safety strategy also has to compete for decision-makers' attention, and also for financial and human resources and sometimes for parliamentary time, with other ways of improving economic efficiency, public health and the quality of life.

Against this background, the 14 key aspects of delivery of the strategy are next discussed, beginning with those where there seems to be greatest scope for acceleration of their implementation and moving on to those where greater difficulties need to be addressed in order to smooth the way to their implementation. The key players in the area of implementation are identified at the end of each section.

2.1 Road safety engineering

Road safety engineering, the physical adaptation of road alignment, layout, signs, markings, equipment and furniture with the objective of reducing risk of death or injury, contributes to at least five of the ten themes of the strategy. It is also highly cost-effective. As argued in more detail in Appendix 5, there is a strong case for investing more resources in local road safety engineering schemes, as it is likely to be a very long time before the scope for cost-effective investment to reduce casualties in this way is reduced to the level that would correspond to dealing with a trickle of new problems arising from year to year in a comprehensively safety-engineered road system.

This point is reinforced by noting that investment of £50 per resident of Gloucester in the Safer City Project (Department of Transport, Local Government and the Regions (DTLR) 2001) was highly cost-effective (with benefits by the end of the 5-year project period valued at about 4 times the sum invested and continuing casualty reduction benefits to be expected in subsequent years), and investment at the same rate for a population of, say, 40 million urban residents would take about 20 years at the current rate of spending on road safety engineering.

On non built-up roads other than motorways, where 53 per cent of deaths and 35 per cent of serious injury on the roads occurred in 2001, mostly to users of motor vehicles, road safety engineering can contribute to speed management on both main roads and country lanes, and on the approaches to villages and towns. Road safety engineering can also help drivers to overtake, negotiate bends and make turning movements with less risk, and reduce the severity of injury when vehicles run off the road.

On built-up roads, where 41 per cent of deaths and 61 per cent of serious injuries occurred in 2001, roughly equally shared between users of motor vehicles, and pedestrians and cyclists, road safety engineering can reduce risk to all kinds of road user on all types of road found in cities, towns and villages.

There is a strong link between vehicle speed in built up areas, the risk of collisions with pedestrians and to the level of injury sustained. By reducing vehicle speeds through the use of packages of urban safety measures, including traffic calming and

traffic management, injuries to pedestrians have been reduced. The introduction of 20 miles/h zones has led to a 61 per cent reduction in all casualties and a 70 per cent reduction in child pedestrian casualties in the affected areas (Webster and Mackie 1996). Grayling et al (2002) have demonstrated that children in the ten per cent most deprived wards were more than three times as likely to be pedestrian casualties than counterparts in the ten per cent least deprived wards and recommend that traffic calming and 20 miles/h be the norm in residential areas. But there are still those, including the emergency services, who are not prepared to accept the inconvenience the speed reducing measures cause and have asked to have them removed or are vocally opposed to their introduction at public consultation. This is an area which needs greater understanding and careful handling by local authorities. On the other hand there are groups of residents who have a strong desire for traffic calming but whose local highway authority cannot deliver the schemes through lack of resources, resulting in waiting lists of many years for these highly cost effective schemes.

There is a clear need to encourage the implementation of road safety engineering measures of known cost-effectiveness to consistent design standards, and in order to do this there is a need to increase the capacity of the profession at local level to be able to undertake this work.

More local and central government commitment is needed to increasing the workforce capacity in this area through allocation of funding to recruitment, training, and the development of an identifiable and motivating career structure.

The Highways Agency has a programme of road safety engineering for its network in pursuit of its target and should be encouraged to progress this vigorously, but the bulk of the responsibility for road safety engineering falls upon local authorities.

In terms of their programming of work and allocation of funding to it, it is too early to say how effective the system of Local Transport Plans and associated Annual Progress Reports for allocation of funding from central government is being in delivering road safety engineering on the ground. This must be monitored closely by the DfT along with the implications arising from the recent announcement from the DfT (DfT 2003b) stating that authorities that have been judged 'excellent' by the Audit Commission as part of the Comprehensive Performance Assessment are to be exempt from requirement to submit most plans, including LTPs. More detail is given in Appendix 2.

The commitment of locally elected members to road safety and the casualty reduction targets is important to harness and retain in two ways. The first is for them to resist diverting funds to other policy areas within the local authority and the second to commit an increase in funds to an accelerated rate of implementation of schemes based on criteria of cost-effectiveness in casualty reduction.

If, however, monitoring were to show that road safety is not being adequately delivered on the ground, then the DfT must work urgently with the local government associations to devise and implement a revised funding mechanism which enables

local authorities across the country to deliver their part of the strategy in the form of cost-effective road safety engineering programmes.

Delivery of road safety engineering lies with local authorities and the Highways Agency

2.2 Crash protection in cars and car-based light goods vehicles

There has been a general improvement in protection built into cars to reduce injury to occupants in collisions. Broughton (2003) estimates that improved occupant protection reduced the numbers of drivers killed or seriously injured in 1998 by about 20 percent compared with what might have occurred if all cars had had a 1980 level of occupant protection. This is continuing with fresh impetus provided ahead of EU legislation by the consumer information programme EuroNCAP.

In contrast to the achievements of motor manufacturers in providing occupant protection ahead of the requirements of EU legislation, corresponding progress towards improving protection of pedestrians and cyclists struck by cars and car-based light goods vehicles is slow. Motor manufacturers need not wait for legislation to make necessary modifications voluntarily, but in the absence of regulatory pressure, most seem reluctant to make these relatively inexpensive changes. They should be encouraged to do so in the very next round of newly designed or extensively retooled models. This process might be helped by changing the EuroNCAP scoring system so that the best scores could be obtained only by providing protection to pedestrians and cyclists as well as occupants of the car.

Even then the effect by 2010 will be very modest because it takes up to 15 years to replace most of the fleet – but acting now is crucial to substantial progress in the decade after 2010.

Delivery of crash protection is in the hands of the motor manufacturers

2.3 Evidential roadside breath testing

One of the strong points of policy to reduce drink driving in Britain is the strength of enforcement of the alcohol limit. Yet it is widely recognised that the effectiveness of such enforcement in terms of numbers of drivers stopped and tested per hour spent on such work by traffic police cars and their crews is severely constrained by the fact that any driver whose roadside test result is positive has to be taken to a police station for more precise breath testing to provide the evidential basis for prosecution. This time-consuming procedure takes the officers away from roadside testing of other drivers.

The research team understands that the technology to enable evidential breath test to be administered at the roadside is available, but that parliamentary time is needed for legislation for its use. This time should be found urgently and the resulting change in procedure and its purpose should be explained clearly to the public in order to give a fresh downward impetus to the annual number killed or seriously injured in accidents where the driver is above the limit – figures which have been largely static for a decade or so.

Delivery of evidential roadside breath testing lies with the DfT, the Home Office and Parliament

2.4 Penalties specific to traffic offences

The strategy includes a review of penalties for road traffic offences. This began with an interdepartmental consultation (Home Office, DETR and Lord Chancellors Office 2000). The resulting report (Home Office, DfT and Lord Chancellor's Office 2002) made some recommendations that could be implemented without legislation and were acted on quickly, one concerned with community service penalties that was seen as depending on further consideration by the Home Office of wider penalty-related issues and is therefore discussed later in this section, and others concerned with penalties specific to traffic offences, some of which it should be possible to implement more quickly.

One of these is for a graduated system of penalties for speeding, with a higher level of points awarded to those exceeding the limit by a wide margin, thus bringing forward the prospect of disqualification and increasing the deterrent effect. Parliamentary time to legislate for this change should be found urgently, and the change should be explained carefully to the public to make it clear that it is directed at deliberate and substantial exceeding of speed limits.

Early consideration should be given also to the introduction of rehabilitation courses based on sound research into effectiveness as part of penalties for persistent driving offenders by analogy with those for drink driving offenders.

Delivery of revised penalties lies with the DfT, the Home Office and Parliament

2.5 Speed management on rural roads

From the summary Strategy Implementation Report on the Road Safety Strategy issued quarterly by DfT, it is clear that one area where progress is slower than hoped is speed management, particularly on rural roads. Whilst most accidents on rural roads occur on single-carriageway main roads, there is considerable risk to vehicle occupants on country lanes. There is also concern among walkers, cyclists and horse-riders about speeds on country lanes.

There are a number of possible reasons for this slower progress, including the complexity of this area, the number of groups who have an active interest and need to be consulted, and the large amount of public interest it generates. These issues should be reviewed, and if required, further resources provided to enable implementation targets to be met.

Local authorities should develop speed management strategies, but guidance on this from DfT is currently awaited, although guidance is expected shortly on village speed limits. Guidance has been issued (DfT 2003c) on the use on rural roads of vehicle activated signs which illuminate to warn drivers approaching hazards too fast. Notwithstanding these, more effort is needed to find ways to improve safety on the approaches to bends and junctions, and to reduce injudicious overtaking.

With sound speed management strategies based on best practice and consultation with local communities in place, authorities will be able to respond in a proactive manner within their road safety engineering programmes to speed management issues. Coupled with this, local issues that receive undue attention (for instance due to a

vocal minority or media interest) will be able to be placed in order of priority against other issues in accordance with such a strategy. This will help free up resources within local authorities which are currently diverted to such matters.

Delivery of guidance on rural speed management lies with the DfT, and delivery of speed management itself with local authorities and the Highways Agency

2.6 Deployment of safety cameras

The new arrangements for funding the use of safety cameras has enabled local partnerships of police, highway authorities, magistrates courts and health professionals to come together to develop automated speed enforcement strategies. The report on the first eight pilot schemes (Gains et al 2003) has shown that cameras, both fixed and mobile, are highly effective in reducing numbers of killed or seriously injured at the sites at which they operate (35 per cent reduction in KSI). The cameras and their associated publicity have also been found to reduce casualties by about 4 per cent in the wider partnership areas (usually a police force area). By the end of 2003 almost all British police forces will have cameras operating in their areas with the potential to contribute a reduction of about 4 per cent to the national number of people KSI.

Deployment of speed cameras by the partnerships is understandably confined to locations where there is a history of speed-related injury accidents. Such locations are of two kinds: those where the problem of excess speed and associated injury accidents is concentrated on a short length of road, and those where it is spread over a long stretch of road or a local area. In the former case, cameras need to be conspicuous to maximise their deterrent effect. In the latter case the area wide deterrent effect can be much enhanced if drivers are warned by way of signs that cameras are operating on the stretch of road or in the area concerned, but have no way of knowing just where the cameras are – that is, the cameras need to be inconspicuous.

In order to retain public acceptance of widespread deployment of cameras in the face of some misunderstanding and adverse treatment by sections of the media, deployment of cameras by partnerships has so far been required to be conspicuous. Greater public understanding and widespread welcoming of camera deployment by local people and local media should soon pave the way to a change in the rules which would allow partnerships to deploy cameras inconspicuously, so that they can be used more effectively in both kinds of relevant location.

However, there may still come a time when the rate of deployment of cameras outpaces the acceptance by the public of their further use. Strategies for enhanced effectiveness of camera deployment should be being developed now so they can be put in place without introduction of substantial further additional cameras once all police forces have rolled out their current programmes.

Delivery of changes in the rules for deployment of cameras lies with the DfT and Home Office in consultation with the Project Board, and delivery of deployment lies with the camera partnerships

2.7 Real time safety advice

There is considerable potential to affect driver behaviour directly in the future through the provision of real time safety advice. Research projects have provided links between motor manufacturers and traffic authorities, with much of this work focussed on the Highways Agency. The full benefits will only be realised if international standards are set for the storage and availability of the relevant data such as speed limits, low bridges or other hazards. There are probably enough results for high level debates to be taking place about a future vision for safe travel using such systems. Although the contribution to casualty reduction before 2010 may well be limited, early first steps are important to enable a substantial contribution in the subsequent decade.

Delivery of progress towards availability of real time safety advice lies in collaboration between the EU, the DfT, motor manufacturers, local authorities and the Highways Agency

2.8 Intelligent speed adaptation

The potential for casualty reduction through behavioural change brought about by intelligent speed adaptation (ISA) is thought to be large and estimates have put it as high as 30 per cent (Carsten 1999). The Government is committed to continuing its research programme in this area and recognises the need to develop a digital road map showing the speed limits. This would need to be kept up to date regularly and reliably. There are still questions to be asked about driver behaviour in response to a device that is capable either of simply advising the driver continually about the local speed limit or of limiting ability to drive above the speed limit, and extensive road-user trials are currently in progress in this country and elsewhere in Europe. A regulatory framework will need to be worked out at EU level but in the meantime such a device could be used at either level of capability on a voluntary basis by drivers when motor manufacturers are able to provide the device and the digital road map is in place. They should be encouraged to do so, and as a contribution to this encouragement, the government should commit itself to a date for availability of the digital speed maps for at least the most densely populated regions of Great Britain.

Delivery of intelligent speed adaptation lies in collaboration between the EU, the DfT, motor manufacturers, local authorities and the Highways Agency

2.9 Enforcement of traffic law

Enforcement of road traffic law is an area of particular sensitivity in terms of public acceptance because enforcement has implications not only for casualty reduction but also for wider relations between the police and the public. The findings in the North Report (Department of Transport and The Home Office 1988) concerning the importance of proportionality of enforcement across the wide range of traffic offences, from minor lapses to manifestly potentially fatal disregard of the law remain highly relevant today. These include the conclusion, so relevant to the current issue of camera deployment in particular and more widely to the scope for use of new technology in enforcement, that the objective of reducing death and injury

“amply justifies the police making use of the best available means within the law to deter and detect offenders ... [including] ...using the latest technology ... [targeted] ... as precisely as possible on those most likely to be in breach of the law.”

Enforcement of traffic law with the objective of casualty reduction has to take its place with other calls upon police effort and court time in ways influenced strongly by Home Office priorities, and the amount of resource dedicated to traffic policing is therefore limited. The National Policing Plan 2003-2006 (Home Office, 2002) has made clear that road traffic policing has an important role in achieving the Government's road safety targets. The Plan also recognises the link between road traffic offences and other crime. This link has been demonstrated in previous research (e.g. Chenery, Henshaw and Pease 1999), which showed that a third of drivers illegally parked in disabled bays had criminal records, half had committed previous road traffic offences, and a fifth were "of immediate police interest" because of suspected connections with unsolved crime.

The National Policing Plan also states that:

“Forces and authorities should include in their local policing plans targeted and intelligence led strategies for reducing deaths and injuries on the roads and achieving a safe environment for all road users”

but there is no guidance as to what these strategies should include as part of such plans or how performance against the plans is to be monitored. The National Policing Plan should be followed up by such guidance.

In the meantime there is concern in some quarters that the increased use of automatic enforcement has replaced the deployment of officers on the ground. It is suggested that this is having a detrimental effect on the deterrence of other forms of driving offences, such as dangerous driving, which are not necessarily related to speeding or red-light running.

Delivery of enforcement lies with the Home Office and the Chief Constables

2.10 Reducing at-work road casualties

As envisaged in the strategy, a task group established jointly by the Health and Safety Commission (HSC) and DTLR. The Work-related Road Safety Task Group, has examined the issue of casualties in road traffic accidents in which one or more of those involved was at work. It has not hitherto been the remit of the HSC or its Executive, the HSE, to address such accidents in the way it does accidents in the workplace, and information about their number has not previously been collected.

The report of the Task Group, the Dykes Report (HSC and DTLR 2001) estimates that up to a third of all road traffic accidents involve someone who is at work at the time, which may account for over 20 deaths and 250 people seriously injured each week. It accepts the principle that the vehicle may be considered a mobile workplace, but the practical implications of this will take time and resources for the HSE and employers to work out.

The report makes a number of recommendations, including a key proposal to apply existing health and safety law to on-the-road work activities so that employers should manage risk on the road in the same way as they manage other occupational health and safety risks. Guidance is due shortly from the HSE to assist employers in doing so. There will be costs to employers in incorporating the guidance into their health and safety management systems, but also savings in days lost from work and vehicle repair costs if their employees are involved in fewer road traffic accidents. Another recommendation is that journey purpose be collected as part of the national road accident data STATS19, and this is likely to be recommended as part of the current review of STATS19, leading to fuller information about the problem on a national basis from 2005.

The HSC and HSE are developing a prioritised programme of work for the coming 2-3 years, and the Occupational Road Safety Alliance, comprising a steering group of 24 relevant organisations has been formed to promote action by employers. It is important that momentum is maintained or increased by all concerned.

Delivery of reductions in at-work road casualties lies with employers and the HSE

2.11 Single/double summertime

The adoption of single/double summertime (i.e. advancing the clocks by one hour throughout the year, thus bringing Britain into the same time zone as most of the rest of the EU) is a cross-departmental matter, in which road safety is only one of many considerations. It has been estimated (Broughton and Stone 1998) that it would have saved an average of 100 lives per year in the period 1991-94, which implies about 80 lives a year now. This is because more death and injury would be prevented in the hour made light in the afternoon or evening than would be caused in the hour made dark in the morning. More than half of these would be pedestrians. The DfT should therefore be continually on the alert with other supportive departments for an opportunity to have this change considered once again, and support it wholeheartedly when such an opportunity arises.

Delivery of single/double summertime is a cross-departmental issue needing to be taken to Parliament

2.12 Reduction of the blood alcohol limit to 50mg/100ml

In 1998 the Government issued a consultation paper *Combating Drink Driving: Next Steps*, (DETR 1998b) there is a strong statement to the effect that:

“The Government is minded to make it an offence to drive with a blood alcohol limit of 50 mg or over.....” (para 39).

The DETR published a summary of the public response to the Government’s proposals in April 2000 but it has not published its response to this consultation paper, giving instead its response through an answer to a Written Parliamentary Question on 20 March 2002, in which it was stated that there are no plans to make a change from 80 mg in the foreseeable future. This limited response has made it difficult to judge what has held the government back from making a change that is estimated to save about 50 lives per year.

The argument has been rejected by Government that a lower level should be adopted in the light of the EU recommendation for a limit not exceeding 50 mg by saying that in the UK there is more stringent enforcement of laws, and there are higher penalties.

“Applying our penalties at 50 mg would put us further out of line with Europe in terms of sanctions. It is also likely that that would be regarded as unduly harsh”.(The United Kingdom Parliament 2003)

But there would be no need to apply the existing penalties of disqualification at 50 mg. A suspended sentence of disqualification could be imposed which would be brought into effect by a second conviction within 10 years for exceeding 50 mg.

This measure should be reconsidered after a reasonable interval, perhaps when forthcoming new evidence from the USA about the effect of lower levels of alcohol on accident involvement becomes available.

Delivery of the reduced blood alcohol limit lies with the DfT and Parliament

2.13 Encouragement of wearing of cycle helmets

It is widely recognised that the level of public acceptance is still too low, and the views promoted by cycling groups too hostile, for the wearing of cycle helmets to be made mandatory. The debate about helmet wearing has become highly polarised (Towner et al 2003). Advocates of helmet wearing base their argument overwhelmingly on the evidence that in the event of a fall, helmets substantially reduce head injury. Those against helmet wearing base their argument on a wider range of issues including the assertions that compulsory helmet wearing would lead to a decline in cycling and loss of benefits to health, that risk compensation negates the injury reducing effect, that scientific studies are defective and that the road environment needs to be improved. There is a clear need for this debate to be defused and clarified so that an agreed basis can be found for strong promotion of helmet wearing by choice.

This exemplifies the fact that some interest groups hold positions that lead to resistance to the introduction of safety measures known to be successful. Ways need to be sought to engage these groups to identify their motivations in operating levers that they hold, and additionally to identify decision makers’ perceptions of these mechanisms.

Delivery of stronger encouragement of wearing of cycle helmets lies with the DfT, local authorities and cycling groups

2.14 Extension of community sentences to non-imprisonable traffic offences

There is a wide range of traffic offences, some of them potentially serious, for which the penalty available to the court is a fine without the option of imprisonment. There are many motoring offenders for whom fines set at the levels normally imposed, or even the maximum fines, are little deterrent, and for whom suitable community sentences might well be a substantially greater deterrent.

The use of such sentences for non-imprisonable offences is recognised to be a substantial departure from past practice which has implications, including resource implications for the Home Office which go beyond the area of traffic offences. Nevertheless, the potential values of such penalties in dealing with traffic offenders should be pursued strongly with the Home Office with a view to achieving their availability sooner rather than later.

Delivery of community sentences for non-imprisonable traffic offences lies with the Home Office, the DfT and Parliament

2.15 Concluding remarks

The key aspects discussed in Sections 2.1-2.14 are those which the review team has identified as bearing particularly directly upon the delivery of casualty reductions. This is in no way to suggest that other aspects of the road safety strategy are unimportant. On the contrary, the strategy is a balanced one based on extensive research and wide consultation, and which needs to be pursued as a whole if the casualty reduction targets are to be met.

Nevertheless, renewed vigour brought to bear upon progressing the foregoing policies and measures offers scope for appreciable acceleration in the delivery of the strategy and renewed encouragement to all stakeholders to think not just in terms of how to achieve the targets for 2010, but by how much they can be exceeded.

At the ministerial and parliamentary level the challenge to government is to be ready where necessary to move as far ahead of relevant opinion as it can carry the affected people and interest groups with it.

At the local level, the challenge to responsible elected members, and especially to portfolio holders, is to set their sights upon the real prospect of substantial casualty reductions through well directed evidence-based effort, and where necessary to resist pressure to divert resources to schemes for which there is local pressure but from which little or no casualty reduction can be expected.

3 Target setting, accident data and research

The success of the road safety strategy will be measured mainly by the extent to which the targets are achieved, and in terms of the national road accident data. It is therefore relevant to look back briefly to the target setting process and to note developments in the road accident data system and the firm basis of the strategy in research.

3.1 The target setting process

It is appropriate to review briefly the national target setting process to ascertain whether, with hindsight at this relatively early stage in the target period and in advance of the DfT's own 3-yearly review to be undertaken during 2003, there are pointers to changes in strategy at either national or local level.

The numerical context for the setting of the current casualty reduction targets for 2010 is described by Broughton *et al* (2000). That work and its relationship to the rest of the development of the strategy are outlined in Appendix 3. The exact form of the

target was a matter for decision by Ministers, and their eventual decisions about targets for numbers KSI and the slight casualty rate implied roughly an extrapolation to 2010 of the rates of reduction and increase respectively in annual numbers KSI and slightly injured over the period of the previous target. But the professional advice provided to them to help them in their decision was based on a wider range of considerations than simply experience with the previous target.

The method adopted for developing that advice was influenced by two considerations:

- 1 The Government's integrated transport policy (DETR 1998a) seeks deliberately to alter the trends of recent decades in road use by encouraging walking, cycling and the use of public transport whilst moderating growth in the use of cars.
- 2 The Government had committed itself to 3-yearly reviews of progress towards the target and of priorities within the strategy, so that the numerical basis of advice on target-setting had to be transparent and the calculations repeatable in the context of the reviews.

These two factors together meant that analysis had to distinguish explicitly between the effects upon future casualty numbers of safety policies on the one hand and changes in use of the roads on the other. Forecasts of future numbers of casualties were therefore made by:

1. forecasting casualty rates per unit of road use in the absence of new safety policies;
2. reducing the resulting forecast casualty rates to reflect the likely effects of new safety policies; and
3. applying these reduced rates to a range of possible future scenarios for road use.

These three steps are discussed in Appendix 3. The review team has considered to what extent the judgements made in carrying them out have been borne out by developments in the intervening 5 years.

Judgements made in the forecasting of casualty rates per unit of road use for various kinds of road user have been largely borne out, and in the few cases where slightly different judgements would be made now, the effect on the overall forecasts of numbers KSI or slightly injured in 2010 would be small.

Judgements about the likely effects of new safety policies on casualty rates were made separately for each road user group, leading to the following assumed aggregate effects on the numbers KSI.

Effects of measures of all these kinds combined multiplicatively 35 per cent
These percentages were based partly upon estimates derived from research assembled by others contributing to development of the strategy, and partly upon aspirational judgements made by those responsible for the numerical work. With the benefit of hindsight, and in advance of the first 3-yearly review, which will be undertaken during 2003, the following comments on the percentages seem appropriate.

1.	New road safety engineering programme	7.7 per cent
2.	Improved secondary safety in cars	8.6 per cent
3.	Other vehicle safety improvements	4.6 per cent
4.	Motorcycle and pedal cycle helmets	1.4 per cent
5.	Safety on rural single-carriageway roads	3.4 per cent
6.	Reducing accident involvement of novice drivers	1.9 per cent
7.	Additional measures to protect pedestrians and cyclists	1.2 per cent
8.	Additional measures to reduce speeds	5.0 per cent
9.	Additional measures to protect children	1.7 per cent
10.	Reducing casualties in drink-driving accidents	1.2 per cent
11.	Reducing accidents during long-distance work driving	1.9 per cent
12.	Additional measures for improved driver behaviour	1.0 per cent

The percentage for the new road safety engineering programme is on the low side because the levels of funding for Local Transport Plans may well allow higher levels of expenditure on road safety engineering than was foreseen, and the cost-effectiveness of such work may well not decline as rapidly as was assumed.

The percentage for improved secondary safety in cars is on the high side because the rate of progress towards this at the EU level, especially in respect of protection for struck pedestrians and cyclists, is slower than was assumed.

The percentage for motorcycle and pedal cycle helmets may be on the low side because of the increase in motorcycling

The percentage for additional measures to reduce speeds was a judgement which it should now be possible to refine on the basis of work carried out for the speed review (DETR 2000b) and the policies for speed management included in and being pursued under the road safety strategy (DETR 2000a).

The percentage for reducing casualties in drink driving accidents is on the high side in the light of the Government's decision not to reduce the blood alcohol limit to 50mg/100ml.

In terms of the three main areas of influence contributing to casualty reduction the total of 35 per cent may be broken down (Allsop 2002) roughly as follows.

- vehicle engineering 15 per cent
- road safety engineering 13 per cent
- road user behaviour 11 per cent

Developments in road use in the intervening years are well within the range covered by the scenarios that were used, except that the recent rate of growth in motorcycling is at the upper end of the range envisaged.

The results of this whole process can be interpreted as indicating that Ministers were quite cautious in setting the target for KSI and rather bolder in setting the target for the slight casualty rate. Caution derives from the fact that the estimates are based on continuation of past trends and the implementation in full of a wide range of policies – neither of which can be taken for granted – but it implies that all concerned should

be thinking by how much the target can be exceeded, rather than merely how to reach it.

It can be expected that all the issues raised here will be considered by the first of the envisaged 3-yearly reviews of the strategy and targets, which is to be carried out in 2003 on the basis of traffic and casualty data to the end of 2002.

3.2 *The national road accident statistics*

The casualty numbers for which the targets have been set are those recorded in the national road accident statistics system known as STATS19. This system is reviewed every 5 years by a responsible body, the Standing Committee for Road Accident Statistics (SCRAS), in consultation with users of the data. The 2002 STATS19 review, whose report is nearing completion, was aware throughout its work of the importance of the STATS19 data for the monitoring of progress towards the casualty reduction targets, and its recommendations can therefore be expected to be consistent with this. They are also likely to include the adoption within STATS19 of a national system for recording of *contributory factors* which the reporting officer will be able to attribute to the accident being recorded. If this recommendation is implemented, the data on contributory factors are likely to be recorded from 2005 onwards and be available for analysis from 2006 onwards.

The background to this likely extension of the STATS19 system is summarised in Appendix 3. It includes the fact that 12 police forces have been recording such data using a prototype national form since 1999, and gives some examples of the kinds of findings that emerge from trial analyses of the resulting data. Any use of those data will, however, need to bear in mind that they are for a particular set of police forces and that they are not comparable with the nationwide data that are likely to become available from 2006 because the form recommended for use from 2005 is likely to differ appreciably from the previous prototype form.

A separate important source of information about factors contributing to road accidents and the mechanisms by which people are injured in such accidents is the detailed on-the-spot study of particular accidents by multi-disciplinary research teams who are called to the scene of the accident as soon as practical after the accident becomes known.

When they become available, the national contributory factors data will extend the range and reliability of estimation of the incidence of particular contributory factors and thus complement the findings of on-the-spot studies. The new data will, however, in no way replace the data from on-the-spot studies, because the judgement of the reporting officer however valuable and experienced, cannot substitute for in-depth multi-disciplinary investigation.

3.3 *The role of research*

These and other sources of relevant data provide the foundation for extensive ongoing programmes of research, covering many safety-related aspects of road user behaviour and road and vehicle engineering. Much of this research is commissioned by the DfT, and details of the current programme and the full text of reports resulting from recent years' programmes can be found on the Department's website. Other government

departments also commission relevant research. Complementary and independent studies are funded by the Research Councils and independent foundations. Research within Britain is further complemented by cross-national studies funded by the EU, and by systematic exchange of information with researchers in other OECD countries. The scope of current programmes is outlined in Appendix 4.

The road safety strategy is firmly based upon knowledge accumulated from half a century's research of these kinds, and ongoing research continually supports and refreshes the development, implementation and monitoring of the strategy in the light of changing circumstances and understanding.

4 The ultimate scope for casualty reduction

In a highly motorised society in which there are competing social, economic and political concerns and other calls upon public and private expenditure, and in an area of policy where there are technical limits to change, and where change requires contributions from many interests and widespread acceptance by all or large parts of the population, there are six main sources of limitation on the degree of casualty reduction that is practically achievable:

- **reasonable expectation** – expectation of casualty reduction stems from risk in using the roads being disproportionately high compared with the risks in other necessary everyday activity; if risk in using the roads is sufficiently reduced, the expectation of further reduction may cease to warrant a high-profile road safety effort distinct from wider policies for public safety;
- **the means of reducing risk** – there are limits to what can be achieved by way of modifying the roads, the vehicles or the behaviour of road users;
- **readiness of government to spend on safety measures** – government should not be expected to spend on safety measures beyond the point at which the benefit to society of doing so comes into appropriate balance with the cost;
- **readiness of interest groups to contribute** – interest groups can reasonably resist safety measures that are sufficiently disadvantageous to them, and can be powerful enough to prevent such measures being implemented;
- **acceptance by the public** – many safety measures affect people's everyday lives or their surroundings sufficiently for their effective implementation to depend on gaining public acceptance; and
- **readiness for political intervention** – implementation of some safety measures requires elected representatives to move ahead of public opinion or confront media pressure in ways that risk unpopularity.

These are discussed in detail in Appendix 5. Some of them will affect policy directly only after the current target period, but others do so already and have been referred to in Section 2. All of them are relevant to understanding of the strengths of the case for vigorous action to reduce the current numbers killed or injured on the roads, the degrees of reduction it is reasonable to aim for in this target period and in the longer term, and the nature of the real difficulties to be encountered and addressed in the pursuit of casualty reduction. They also point to a number of areas where tractable further research could increase understanding and facilitate progress.

5 Identified areas for further work.

Research is needed to increase and update knowledge, or to make existing knowledge more accessible, in several areas that go beyond current research programmes. The review team's work has identified 11 specific areas where research could be useful to the development, implementation and assessment of current and future policies in road safety. Seven of these relate to aspects of delivery of the current strategy, one addresses the need for research-awareness among all concerned with road safety, and three look beyond the period up to 2010 covered by the current strategy.

5.1 Research into aspects of delivery of the current strategy

Two research areas relate to the cost-effectiveness of road safety engineering, whose importance is discussed in Section 2.1 and Appendix 5. Road safety engineering has hitherto been cost-effective by such wide margins that simple methods of estimation have sufficed. But with increased investment in such schemes, it will be important to keep estimates of cost-effectiveness up-to-date and to refine the methods of estimation. Work is therefore recommended to;

- produce an up-to-date estimate of the cost of prevention of a death implied by the rates of return on investment currently being yielded by programmes of expenditure on road safety engineering under Local Transport Plans, taking into account all the costs arising from such programmes and the resulting schemes.

Previous estimates have made use of a database of schemes known as MOLASSES, but this is neither representative of the types of schemes implemented, as only the more effective schemes tend to enter the database, nor does it provide a complete picture of their costs because only the cost of construction are included. It is therefore recommended to;

- develop and keep up to date, a database of road safety engineering schemes to replace the current MOLASSES database. This should contain full cost-benefit information for schemes that did not produce forecast casualty reductions, as well as those that did.

The next two research areas relate to engaging with interest groups to understand the potential impacts on them of the road safety strategy, and informing decision makers' judgements of public acceptability of policies and measures. These are to;

- make a systematic inventory of interest groups who might reasonably object to foreseeable safety measures and policies and the rationale for their objections; and
- compile and then keep up to date an authoritative synthesis and digest of results of surveys of public opinion on road safety issues.

The last three research areas under this heading are concerned with enforcement and need to be undertaken in cooperation with the Home Office. They relate primarily to the effectiveness and cost effectiveness of enforcement strategies and are to:

- develop specific agreed performance indicators that relate directly to ways in which police can influence road safety. (These should be developed and

monitored by the Home Office in association with other stakeholder departments.);

- evaluate the effectiveness of current enforcement strategies; and
- undertake a cost benefit analysis comparing traffic policing with action against other types of crime.

5.2 Enhancing research awareness in the road safety community

Dissemination of research findings is an important part of the duties of all researchers and sponsors of research. However, accessibility of these findings to researchers, practitioners and others actively trying to reduce casualties is a major issue. People need to have accessible to them the latest research in order to keep abreast of the developments in this complex area and to allow them to participate fully in delivering actions needed to achieve the current target and in the development of its successor. It is therefore recommended to undertake reviews and produce digests in accessible form of road safety research funded by Government, the British Research Councils and foundations, the EU, the motor manufacturers and other interest groups, or published in learned journals or by the OECD

5.3 Looking beyond 2010

Three areas of research are recommended in order to begin to explore the scope for and eventual limitations on casualty reduction as discussed in Section 4 and Appendix 5. These are to:

- make an improved estimate of the risk of death per person-hour in everyday life other than use of the roads by use of more exact and more finely disaggregated numbers of accidental deaths and associated numbers of person-hours spent in different activities;
- attempt to make an indicative estimate of the reduction in annual numbers killed or seriously injured that would result from undertaking all road safety engineering yielding benefit/cost ratios exceeding 3 and exceeding 1.25 , and the total investment required in each case; and
- attempt to make an indicative estimate of the annual numbers who would still be killed or seriously injured in Britain if the objectives of Sustainable Safety as developed in The Netherlands were pursued as far as would be feasible here.

It is for the Motorists' Forum to consider which, if any, of these 11 items should go forward in Stage 2 of this review.

6 Summary of recommendations

To accelerate delivery of the road safety strategy to 2010 and contribute to the foundations for further progress after that, the review team makes the following recommendations.

1. Investment in cost-effective road safety engineering should be increased by the allocation of more funding to it and the training and effective deployment of more staff skilled in the planning and management of such programmes in local authorities and the Highways Agency.

2. Motor manufacturers should build substantial protection for struck pedestrians and cyclists into the very next round of newly designed or extensively retooled models.
3. Legislation for evidential roadside breathtesting should be introduced in the next session of Parliament.
4. Legislation for a graduated system of fixed penalties for speeding should be introduced in the next session of Parliament and early consideration should be given to the introduction of rehabilitation courses as part of penalties for persistent driving offenders by analogy with those for drink driving offenders.
5. Guidance concerning speed management on rural roads should be issued by the DfT and local authorities and the Highways Agency should act upon it promptly.
6. Safety camera partnerships should be allowed to use inconspicuous cameras where speed-related casualties occur disproportionately over long lengths of road or local areas, and should give thought to enhanced deployment of cameras without necessarily further increasing their numbers.
7. Debate should be started between motor manufacturers and various levels of government about how to realise the potential for real time safety advice to drivers.
8. Motor manufacturers should provide intelligent speed adaptation equipment as an option in new cars and the DfT should commit itself to a date for availability of a digital speed limit map for Great Britain.
9. The National Policing Plan should be followed up by guidance on targeted and intelligence-led enforcement strategies for casualty reduction and on the monitoring of performance in respect of traffic policing under local policing plans.
10. The momentum of work by the HSE and the Occupational Road Safety Alliance to engage employers in the reduction of at-work road casualties should be maintained or increased.
11. The DfT should be continually on the alert with other supportive departments for an opportunity to have the adoption of single/double summer time considered once again, and support it wholeheartedly when such an opportunity arises.
12. Reduction of the blood alcohol level to 50mg/100ml should be reconsidered after a reasonable interval.
13. The debate on cycle helmet wearing should be defused and an agreed basis found with cycling groups for strong promotion of helmet wearing by choice.
14. The potential value of community sentences for non-imprisonable offences in dealing with traffic offenders should be pursued strongly with the Home Office with a view to early legislation for their availability.
15. Consideration should be given to pursuing the lines of research proposed in Section 5.

7 References

This list is of references cited in the report. Those relating to appendices appear at the end of each appendix.

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Appendix 1: Terms of reference and membership of the Advisory Panel

A1.1 Terms of reference

Stage 1 of the research project is a scoping study designed to:

- provide the Motorists' Forum with a clear assessment of the relative priorities and importance of the factors that can influence delivery of the Government's Road Safety Strategy;
- provide a clear assessment of the constraints that are stopping that strategy being delivered to its maximum effect;
- provide a clear assessment of the key factors (and their inter-relationship) that influence the casualty reduction "*limit*" that is practically achievable; and
- illustrate clearly the key issues arising in this initial stage of the project that should be investigated further in Stage 2.

A1.2 Membership of the Motorists' Forum Advisory Panel

The Motorists' Forum Advisory Panel under the chairmanship of Sir Christopher Foster has helped our thinking on many issues through its members comments and observations, lively and informed discussions, and exchanges of emails.

Sir Christopher Foster	Chairman
Grant Allan	Commission for Integrated Transport
Brian Goodwin	County Surveyors Society
Robert Gifford	Parliamentary Advisory Council for Transport Safety
Kevin Delaney/Jonathon Simpson	RAC Foundation
Kevin Clinton	Royal Society for the Prevention of Accidents
Andrew Howard	The AA Motoring Trust
Jeremy Moore	Association of Chief Police Officers
David Prescott	Secretariat to The Motorists' Forum.
Neil Williams	
<i>Observers</i>	
Sandy Bishop	Head of Road Safety , Department for Transport
Kate McMahon	Economic Adviser, Road Safety Division, DfT

Appendix 2: Central and local government policies, targets, and performance indicators

The Department for Transport's road safety strategy and the targets contained therein is the Government's primary road safety target but there are other Central Government Departments with targets and performance indicators set by their own Ministers which are synergistic with the DfT's. These are outlined below.

A2.1 Other Central Government Policy

A2.1.1 The Home Office

The Home Office is responsible for Policing which includes enforcing road traffic law and the setting of penalties for offences.

Whilst the Home Office does not have a PSA target for casualty reduction it has for its Police Forces, a Best Value Performance Indicator (BVPI 132) relating to road safety - Number of road traffic collisions involving death or serious injury per 1,000 population of the police force area.

However, the extent to which this is monitored is unclear. The levels to which police forces record road traffic accidents is relevant here. If there is a change in recording policy this could influence whether the target is reached. The BVPI may also be seen to be out of the control of police as such a measure is influenced by a multitude of factors in addition to road policing. Of greater use would be specific measurable indicators tailored to police enforcement.

A.2.1.1.1 Enforcement

The main role for the police in road safety is in enforcement, but they also have involvement in other relevant areas, including engineering (providers of accident data, assistance in safety schemes and audit); and education, training and publicity (e.g. education in schools). The Association of Chief Police Officers (ACPO 2002), in their recent document *Modern Road Policing: A Manifesto for the Future* focus on 4 key areas: enforcing the law; promoting road safety; investigating incidents; patrolling the roads.

It was suggested in Her Majesty's Inspectorate of Constabulary (HMIC) report (1998) that Chief Constables should involve 'service deliverers in the development of their strategies, and negotiate formal partnership strategies with other agencies.' HMIC proposed that the Association of Chief Police Officers (ACPO) should monitor and evaluate the implementation of these road policing strategies and traffic policies.

In practice the main areas of enforcement that have a significant impact on road safety are speeding and drink-driving. In the case of speeding, the arrangements which allow netting of fines from safety cameras have led to an increase in their use. This has had the effect of increasing awareness of the problem of speeding but we do not know to what extent it has had an effect on enforcing the law in areas where there are no speed cameras.

In the area of drink driving, the Government's consultation paper *Combating Drink Driving: Next Steps*, (DETR 1998b) included a possible option to introduce road side evidential breath testing instead of having to take offenders to the police station to give an evidential breath test on a machine there (Para 26). This would allow the whole matter to be dealt with at the roadside thus reducing the amount of police time. This is dealt with in Section 2.3.

A.2.1.1.2 Penalties

The Home Office (in association with the Lord Chancellors Office and DTLR) conducted consultation on a Review of Road Traffic Penalties in December 2000 and a report issued on the response to consultation in July 2002 (Home Office, DfT Lord Chancellor's Office).

The reform of penalties for traffic offences is partly caught up in a wider Home Office review of penalties for offences partly because primary legislation is required for many of the changes and this is delaying changes that would reduce traffic offending. In the meantime, because it does not require legislation, strengthened Guidance has been issued to sentencing authorities.

A2.1.2 The Health and Safety Executive and Health and Safety Commission

In the strategy **Revitalising Health and Safety** (DTLR & HSE 2000) the Health and Safety Commission has targets to be achieved by 2010 however these do not specifically relate to driving whilst at work.

Section 2.10 deals with the role of the HSE and the employers in reducing work related casualties.

A2.1.3 Department of Health

In its White Paper *Saving Lives; our healthier nation*, The Department of Health (DH 1999) set national **targets for England** to reduce by 2010

- death rates from accidents (of all kinds including road traffic accidents) by at least one fifth; and
- the rate of serious injury by at least one tenth.

The definition for serious injury used by the Department of Health is those requiring a stay in hospital of four days or more.

The White paper announced the setting up of an Accidental Injury Task Force which presented its report *Preventing Accidental Injury – Priorities for Action* to the Chief Medical Officer (DH 2002). It was endorsed by five other Government Departments including DfT. Road traffic accidents are the leading cause of child death. The priority groups for action were identified as children and young adults, and older people. Inequalities in injury occurrence within these groups was identified as a priority area. The report recognises that integrated action across Departments and disciplines is needed to reduce injury and concluded that the DH is best placed to steer cross-Government action.

Little has happened since publication of this report. Accidental injury has slipped down the agenda and no implementation plan has been developed. In the case of road traffic accidents the DfT has the policy lead but there is much the NHS can do, especially at the local level in terms of advocacy and information sharing between local highway authorities and hospitals.

A recent announcement indicated that NICE (National Institute for Clinical Excellence, 31 March 2003) is to develop guidance on reducing accidental injury outside the home. The meaning of this has not yet been clarified but it is understood that it will include road accidents in some form.

A2.1.4 The Treasury

The Treasury published its 2002 Cross-Cutting Review *Tackling Health Inequalities* in which it set out a long-term strategy what is a national priority area for Government. The major health inequality in the transport field is child pedestrian deaths where children in social class V are five times more likely to be killed in a road traffic accident as a pedestrian than are children from social class I. Other inequalities in transport relate to difficulty in accessing health, education and leisure services.

The Department of Health has a PSA target which includes life expectancy in which the Treasury sees contributions toward reaching it coming from environmental improvements such as preventing road traffic accidents especially among old and young road users.

A2.2 Local authority role in delivering the road safety strategy

Local Traffic Authorities have an important role to play in delivering the road safety targets through their Local Transport Plans (LTPs) at the local level. In setting local targets Local Traffic Authorities should have regard to the PSA target set out in the Road Safety Strategy (DETR 2000a) and most have adopted the 40 percent reduction in KSI casualties and 50 per cent reduction in KSI casualties for children. The measures implemented at national level by Government and motor manufacturers and contributions from the National Policing Plan are all expected to contribute to the Local Authorities casualty reduction efforts.

The fact that most Local Authorities have adopted the national target locally is not unreasonable as it is a percentage change and not a number of casualties to be reduced. If the best performing authorities were coming to the end of their highly cost effective road safety engineering schemes, then the resources needed for them to reach a target of 40 per cent might well be better used elsewhere and in this case there would be a case for a different target. But as the list of highly cost-effective schemes in even the best authorities is long, it is unlikely that any will run out of good casualty reduction programmes before 2010.

In addition, the DfT has recently (April 2003) issued Guidance to local highway authorities which requires them to submit a statement in their Annual Progress Reports to their LTPs showing how they intend to tackle the casualty problem in deprived areas and to state in future reports how the relative rate of casualty reduction in deprived areas has compared with the rest of their LA area.

A2.2.1 Local Authority Best Value Performance Indicators for Road Safety

Best Value Performance Indicators are set by Central Government in order to ensure that local authorities can demonstrate they are improving services. Each year a best Value Performance Plan needs to be submitted.

The delivery of road safety by a **Local Authority** is measured by Best Value performance Indicator (BVPI) BV99 which requires annual calculation of the number of road accident casualties per 100,000 population broken down by nature of casualties and road user type. This is a statutory requirement on Local Authorities (Office of the Deputy prime Minister (ODPM) 2000).

- The casualty categories are: killed or seriously injured, slight injuries
- The road user types are: pedestrians, pedal cyclists, two-wheeled motor vehicle users, car users, and other vehicle users

Maltby (2003) in her review for PACTS of *Best Value, Local Transport Plans and Road Safety* gives a summary of the impact of these on Local Authority practice and the reader is referred to her report for the detail. The report notes that the performance indicator does not relate to the headline national casualty reduction targets. The fact that it is different from the national target may at first seem confusing to some but it is in the same direction as the national target and it does allow population based rates to be compared with other authorities of different size.

In addition to BV99 Local Authorities are able to set their own local PIs and many of these have been set relating to speed reductions, child casualties, accident involvement of young and old drivers and accidents in relation to distance travelled (Maltby 2003).

This exercise is helpful, along with Best Value inspections for keeping LAs abreast of progress in other places. However, at this stage we do not have a clear idea of why some authorities function better than others and a current DfT study is beginning to address these points.

Local Authority performance on key indicators related to road safety should be benchmarked against similar authorities. This process allows direct comparisons to be made between the best in a group and the rest.

A2.2.2 Local Transport Plans: human resource constraints on implementation

The changes to Local Authority funding in the form of five year Local Transport Plans announced in the Integrated Transport White Paper have had a fundamental effect on the delivery of services locally, and this includes road safety. The second major change was the introduction of the Single Capital Pot (SCP) which requires Local Authorities to produce Asset Management Plans (AMPs) and capital strategies (CS).

The SCP was introduced in April 2002 and is a new method for allocating capital support which replaces previous separate allocations to Transport, Housing,

Education and Health by a single sum which should encourage authorities to take a more joined-up, cross-departmental approach to capital investment (DTLR 2001).

Local Transport Plans are designed to focus on local transport needs after consultation with the local community. The LTP contains a five year strategy with a bid to central government for the capital funds to deliver the programme. The LTP is the key to delivering casualty reductions at the local level. As each plan is tailored to the needs of the local community through consultation, they do not conform to a single standard throughout the country (DETR 1998a).

A recent announcement from the Office of the Deputy Prime Minister (March 2003) states that Authorities that have been judged as “excellent” by the Audit Commission as part of the Comprehensive Performance Assessment are to be exempt from the requirement to submit most plans, including LTPs (DfT 2003b).

Each year the highway authority is required to produce an Annual Progress Report in which it submits its targets and progress towards achieving them. The Authorities judged as “excellent” will no longer need to submit a full Report. However, they will still be required to report on progress towards national and local targets, the delivery of their programme on the ground, together with the effectiveness of their spending programme (DfT 2003b). Given that this is a new requirement it is noted here that its effects on road safety will need to be monitored. It is interesting to note that one of the “excellent” authorities is not within the top 25% for road safety according to its Best Value Inspection.

In addition to the introduction of LTPs, Best Value and the Single Capital Pot, there has been Local Government reorganisation and the introduction of Unitary Authorities. According to the Atkins (2003) report for the Commission for Integrated Transport (CfIT) transition to these new arrangements together with frequent local elections, have slowed the progress in fully implementing the LTPs. Within this, road safety is no exception.

The Atkins report is primarily about the identification of key obstacles that are hindering delivery of LTPs, which in turn affect delivery of the 10 Year Plan. CfIT has already called upon the Government to take a new look at funding and delivery of projects (March 2003). However the report points to several issues that are hindering progress that are relevant to road safety.

- There are widespread staff shortages at senior levels and lack of career path with appropriate training and this is hampering LAs’ ability to spend their allocation. Some authorities are buying in consultants to be able to maintain progress.
- Within LAs there appears to be more of a political will to tackle road safety as it is seen to be less controversial than some of the more “difficult areas” of congestion and demand restraint. However, there is a tendency amongst several authorities to shift money previously allocated to road safety to other areas such as housing and education under the SCP arrangements.
- Traffic calming, amongst other issues, is not universally popular, although it has its supporters in many authorities.

“Authorities struggle to ‘marry up’ polarised views and few had the resources or political strength to justify decisions to opponents. This means that schemes are delayed or even abandoned because of opposition – often from a vocal minority.”(para 7.30)

This latter point is part due to severe lack of skilled staff at all levels and part due to the length of time consultation takes. Staff are paid from revenue funds and the large increases in capital funds through their LTPs does not immediately help the situation. Maltby recommends that there should be far more flexibility to use capital funds on staff costs and more funding for better training in the new skills required to operate effectively under the LTP regime. Lack of skilled staff is seen as the biggest threat to delivering the casualty targets. This issue was also dealt with in Section 2.

The University of the West of England’s Unit for Transport and Society is examining the issue of the short term skills gap in local authorities for the County Surveyors Society (CSS) and is expected to provide recommendations for good practice to address the short term skills gap.

In a response to the shortage of skilled workers in the transport industry, the Home Office have included Traffic Engineers in their list of ‘shortage occupations’. This recognises the acute shortages of qualified workers in this field, and exempts a UK employer from having to advertise a vacancy in order to prove that they could not recruit from within the European Economic Area.

A2.3 References

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Appendix 3: Target setting and accident data

A3.1 Review of the national target setting process

The numerical context for the setting of the current casualty reduction targets for 2010 is described by Broughton *et al* (2000). The detailed statistical work described there was carried out at the TRL by Broughton himself, and the interpretation and judgements based on it were made by a subgroup of the STAR (Strategy and Targets for Accident Reduction) group set up by the Road Safety Division of the then Department of the Environment, Transport and the Regions (DETR) to oversee the development of the road safety strategy. At that time it was already envisaged on the basis of experience with the target for 2000 set in 1987 (Department of Transport 1987) that there would be separate targets for killed or seriously injured (KSI) and for slight casualties, but it was not yet envisaged that there would be a separate target for children.

A3.1.1 Basis for numerical advice on target setting

The exact form of the target was a matter for decision by Ministers, and although their eventual decisions about targets for numbers KSI and the slight casualty rate implied roughly an extrapolation to 2010 of the rates of reduction and increase respectively in annual numbers of KSI and slightly injured over the period of the previous target, the professional advice provided to them to help them in their decision was based on a wider range of considerations than simply experience with the previous target.

The method adopted for developing advice on the numerical levels at which the targets should be set was influenced by two considerations:

- 1 The Government's integrated transport policy (DETR 1998a) seeks deliberately to alter the trends of recent decades in road use by encouraging walking, cycling and the use of public transport whilst moderating growth in the use of cars.
- 2 The Government had committed itself to 3-yearly reviews of progress towards the target and of priorities within the strategy, so that the numerical basis of advice on target-setting had to be transparent and the calculations repeatable in the context of the reviews.

These two factors together meant that analysis had to distinguish explicitly between the effects upon future casualty numbers of safety policies on the one hand and changes in use of the roads on the other. Forecasts of future numbers of casualties were therefore made by

- forecasting casualty rates per unit of road use in the absence of new safety policies;
- reducing the resulting forecast casualty rates to reflect the likely effects of new safety policies; and
- applying these reduced rates to a range of possible future scenarios for road use.

A3.1.2 Forecasting of casualty rates

The method of forecasting casualty rates for each main road user group was to extrapolate the longstanding tendency for the logarithms of such rates to change roughly linearly over time in the short to medium term. Extrapolation to 2010 was based upon examination of the changes in the various rates over the period 1983-1998, after adjustment for the estimated effects of three particular kinds of road safety measure whose effects over that period had been estimated in separate exercises. The graphs used for this purpose are presented by Broughton *et al* (2000). The main judgement required was whether the rate of change to be extrapolated should be the average for the whole period 1983-1998 or for a shorter period ending in 1998.

The amounts by which the extrapolated rates were reduced to reflect the likely effects of new safety policies are discussed in Section A3.1.4.

A3.1.3 Scenarios for road use

Scenarios for road use in 2010, 36 in number to cover a wide range of possibilities, were constructed from the National Road Traffic Forecasts of 1997 (DETR 1997) and the relevant aspects of the integrated transport policy (DETR 1998).

A3.1.4 Sources of reduction in casualties

The reductions required to meet the targets are expected to stem from a combination of two processes. The first is the continuation of the general downward tendency in numbers KSI and in the slight casualty rate that is the product of increased motorisation and associated adaptation by society, including those road safety policies and their implementation which have become accepted policy and practice. If past trends continue, this should provide a reduction of 20-25 per cent in the numbers KSI between 1996 and 2010. The second is the implementation of new policies and measures of twelve kinds which, pursued as far as seems foreseeably practicable up to 2010 should reduce the number of KSI by 35 per cent by then. Combining these two estimated reductions multiplicatively gives a reduction of about 50 per cent, and the lower target of 40 per cent recognises that the past tendency may not continue in every respect, and that not all of the envisaged policies may be able to be pursued to the full.

Judgements about the likely effects of new safety policies on casualty rates were made separately for each road user group, leading to the following aggregate effects on the numbers KSI.

1. New road safety engineering programme	7.7 per cent
2. Improved secondary safety in cars	8.6 per cent
3. Other vehicle safety improvements	4.6 per cent
4. Motorcycle and pedal cycle helmets	1.4 per cent
5. Safety on rural single-carriageway roads	3.4 per cent
6. Reducing accident involvement of novice drivers	1.9 per cent
7. Additional measures to protect pedestrians and cyclists	1.2 per cent
8. Additional measures to reduce speeds	5.0 per cent
9. Additional measures to protect children	1.7 per cent
10. Reducing casualties in drink-driving accidents	1.2 per cent
11. Reducing accidents during long-distance work driving	1.9 per cent

12. Additional measures for improved driver behaviour	1.0 per cent
Effects of measures of all these kinds combined multiplicatively	35 per cent.

These percentages were based partly upon estimates derived from research assembled by other subgroups of the STAR group, and partly upon aspirational judgements made by the subgroup responsible for the numerical work.

A3.1.5 Implications of subsequent events

Implications of subsequent events for the various judgements mentioned in the previous three subsections are discussed in Section 3.1 of the report.

A3.2 Prospects for national data on contributory factors

In the 1950s the national road accident data recording system known as STATS19 included a list of ‘causes’ which the reporting officer could attribute to the accident being recorded. Although this ceased to be part of the STATS19 system from 1959, many police forces continued to record such information and supply it to their local authorities as part of the information that it is common for police forces and local authorities to record by local agreement in addition to the nationally agreed coverage of STATS19. More recently, this type of information has come to be called *contributory factors* in the light of the understanding that most accidents arise not from a single cause, but from a combination of a number of circumstances, altering any one or more of which would change the probability of the accident happening

By the mid 1990s rather more than half of the police forces in England and Wales were still recording such data, using either a simple list or a coding scheme (Maycock 1995), and there was a widespread view among road safety professionals that national collection of such data on a common basis would enable enhanced understanding of road safety problems and help in targeting remedial measures. Research was therefore undertaken (Broughton, Markey and Rowe 1996) to develop a prototype national coding system for contributory factors. The objectives were that the system should encourage collection of data of high quality by covering the great majority of accidents within a standard set of codes that is suitable for use without extensive training or documentation by police officers who may attend only one or two accidents per year.

The outcome was a coding form which trial use by a number of police forces showed to be usable from the forces’ point of view and to yield data that were both broadly consistent between different police forces and, in terms of the broad types of factor recorded, consistent with earlier detailed ‘on-the-spot’ studies of accident occurrence. The form required the identification of a single *precipitating factor* describing the main thing that went wrong in the immediate run-up to the accident, and then the identification of up to four *contributory factors* that had helped to give rise to that precipitating factor. Degree of confidence in identifying a contributory factor was indicated by coding it as definite, probable or possible. The form offered 14 specific precipitating and 51 specific contributory factors, together with possibilities for nominating ‘others’, but in practice only 5 precipitating factors were identified in more than 10 per cent of accidents, and these accounted for 80 per cent of accidents. Similarly, only 7 contributory factors were identified in more than 10 per cent of accidents. Trial analyses illustrated the potential value of analysing the contributory

factors data jointly with STATS19 data, which would be possible routinely if contributory factors data were once again to be included in the nationally agreed range of STATS19 data.

The STATS19 system is reviewed every 5 years by a responsible body, the Standing Committee for Road Accident Statistics (SCRAS), in consultation with users of the data. In the 1997 review, the proposed national form resulting from the research just described was considered for inclusion. The outcome was that some police forces adopted the form voluntarily, others continued using their previous systems, and the remainder continued to record no contributory factors data. In particular, 12 forces have been using the proposed national form since 1999, so that 3 full years of data for those forces have been collected.

The 2002 STATS19 review, whose report is nearing completion, returned to the question of a national system for collection of contributory factors data within STATS19, and in the course of that review, research has been undertaken to review the proposed national system and recommend possible improvements to it and ways to secure nation-wide implementation. This research has taken into account experience not only with the proposed national system but also with alternative systems used by other police forces. The outcome is that the STATS19 review is likely to recommend adoption of a modified national system within STATS19 from January 2005 along with other smaller changes to the system – changes of the kind that more typically result from the 5-yearly reviews.

In the meantime, any use of the data obtained using the previously proposed national form will need to bear in mind that:

- they are for a particular set of police forces; and
- they are not comparable with the nationwide data that is likely to become available from 2006.

Nevertheless, work with them in conjunction with STATS19 data for the same accidents in these police force areas in the relevant years may well provide useful indicative information about the relative importance of different contributory factors in various kinds of accident. Such work will also provide research experience in the joint use of these two kinds of data which will be valuable in accelerating the process of learning to make good use of the extended STATS19 data, including nationwide contributory factors data when these become available from 2006.

For the purposes of this Review, one of the Review Team at UCL has been given access to some trial tabulations of data for the year 2001 demonstrating conclusions such as the following about accidents in these police force areas as illustrations of the scope offered by data of this type.

- Over 80 per cent of the accidents had one of the following five precipitating factors: failed to give way; failed to avoid vehicle or object in carriageway; loss of control of vehicle; pedestrian entered carriageway without due care; and poor turn/manoeuvre. No other precipitating factor was recorded for more than 5 per cent of accidents.

- The following contributory factors were recorded for more than 5 per cent of accidents: impairment – alcohol; behaviour – careless/thoughtless/reckless; behaviour – in a hurry; failed to judge other person’s path or speed; failed to look; looked but did not see; inattention; excessive speed; following too close; lack of judgement of own path; and slippery road. An average of just over 2 contributory factors were recorded per accident.
- The factors of both kinds and the relative frequency with which they were identified differed greatly between different types of accident. For example, in collisions between a car and a motorcycle in which the precipitating factor was linked to the motorcycle, ‘poor overtaking’ replaced ‘pedestrian entered carriageway without due care’ among the only five precipitating factors recorded for more than 5 per cent of accidents. In such collisions, ‘inexperience of driving’ and ‘aggressive driving’ replaced ‘impairment – alcohol’ among the contributory factors recorded for more than 5 per cent of accidents.
- In contrast, for collisions between a car and a motorcycle in which the precipitating factor was linked to the car (which numbered about 60 per cent of collisions between a car and a motorcycle), the only three precipitating factors recorded in more than 5 per cent of accidents were: failed to give way; failed to avoid vehicle or object in carriageway; and poor turn/manoeuvre. In such collisions, neither ‘impairment – alcohol’, ‘excessive speed’ nor ‘following too close’ were recorded for more than 5 per cent of accidents.
- In single vehicle accidents between a car and a pedestrian, the only two precipitating factors recorded for more than 2 per cent of accidents were ‘failed to avoid pedestrian (pedestrian not to blame)’ and ‘pedestrian entered carriageway without due care’, and these were recorded in the ratio 2 to 7. The contributory factors recorded differed markedly, as would be expected, between accidents with these two precipitating factors.

In short, the availability of nationwide data concerning contributory factors will open up new possibilities for analysis and understanding of the ways in which various kinds of accidents occur, but it will be several years before such findings will be available to influence the rate of progress in casualty reduction.

A3.3 Data from on-the-spot accident investigations.

A separate important source of information about factors contributing to road accidents and the mechanisms by which people are injured in such accidents is the detailed study of particular accidents by multi-disciplinary research teams who are called to the scene of the accident as soon as practical after the accident becomes known. These studies are necessarily resource intensive and confined to small numbers of accidents within a limited radius from the base where the research team concerned is located.

Two studies of this kind are currently in progress in Britain. One of these, the co-operative crash injury studies, has been ongoing for many years and is mainly concerned with the biomechanics of injury in relation to structural features of cars. The other, the on-the-spot studies, is taking place over a few years and is concerned with contributory factors of all kinds, those associated with the road environment, the vehicle or the road user. This will update the widely quoted picture provided by

similar studies in the early and late 1970s and a related study of urban accidents in the late 1980s.

For practical reasons, the accidents covered by these studies cannot be a statistically representative sample of all accidents that occur. Instead, they form a wide-ranging set of examples from which extensive insights into contributory factors can be obtained. Any quantitative extrapolation of the results to the national patterns of accident occurrence depends upon careful judgements of associations between identified contributory factors and particular categories of accident that can be identified from STATS 19 data.

The national contributory factors data discussed in Section A3.2 will extend the range and reliability of estimation of the incidence of particular contributory factors and thus complement the findings of the on-the-spot studies. The new data will, however, in no way replace the data from on-the-spot studies, because the judgement of the reporting officer however valuable and experienced, cannot substitute for in-depth multi-disciplinary investigation.

A3.4 References

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Appendix 4: The role of research

A4.1 The research community

Over the years there has become a shortage of research staff with the necessary skills. The area is not attracting enough young researchers to build a strong research capacity that is sustainable. There needs to be sufficient capacity to carry through any research agenda in road safety but there are only a small number of universities and consultancies who are experienced in the more complex areas of road safety research, and these are often made up of very small teams or even individual researchers, many of them in the second half of their careers.

There is need for more cross-departmental working in the area of road safety with the consequent need to ensure sustainable collaborations are built up. Government has a role to play to ease this problem through its funding streams and commissioning practice.

A4.2 Road safety research

The Department of Health in its Task Force Report on injury prevention (DH 2002) has a section on dissemination of research. It is equally relevant to road safety.

“Dissemination of information is an important part of the duties of all researchers and Government Departments. Research needs to be put into practice. The first step is to make people aware of research findings relevant to their practice. The accessibility of research findings is a major issue across all research fields.”

Much research is being undertaken, especially by DfT whose research budget for road safety is of the order of £4.6million per annum for road safety and another £4.8million for vehicle safety. The Compendium of Research Projects 2001/2002 (DTLR 2002a) lists a strong research programme across all areas of the road safety strategy. The majority of the research results are published either by the contractor who was engaged to undertake the work (DfT has links to TRL's website) or by DfT itself. However, despite this being readily available there is a general lack of knowledge of work completed. Even for researchers in the field there is a task at the beginning of each research question to search the literature.

The DfT is not the only body who sponsors research. There are research councils such as EPSRC (Engineering and Physical Science Research Council) and ESRC (Economic and Social Research Council). The dissemination of results of road safety projects funded by these means are rarely on the bookshelves of practitioners.

An important source of transport and road safety research is the EU under its framework programmes. Many of these outputs may be found on the CORDIS website (www.CORDIS.lu). However, this website is not easy to use and needs to be updated by the EU itself.

The OECD publishes reports on a wide variety of road safety issues. But again the results of this work are almost unknown to practitioners and not as widely used by the research community as they might be.

- Dissemination strategies need to be developed by the DfT and others at national, regional and local levels so that research results are accessible and relevant to those involved in road safety at the local level. One way to achieve this is to ensure that support is given to more reviewing activity so that what research there is, can be made easily accessible to everyone who needs it.

DfT disseminates many of its research findings through conferences and seminars aimed at practitioners. It has recently (DfT 2002b) put on a seminar to bring together practitioners, policy makers and researchers to share their knowledge in the area of recently completed child road safety research. The day was well attended and the feedback positive from the practitioners. Time will tell whether this event changed practice at the local level.

There is an issue as to whether LAs think they have enough guidance from DfT. However, the DfT issues Traffic Advisory leaflets and good practice guides on many subjects. The DfT has recently undertaken a survey of LAs to ascertain how many are using its *Road Safety Good Practice Guide* (DTLR 2001). Once the results of this become available it may be possible to point to where the breakdown in communication lies.

- Dissemination is not just a matter of making people aware of the results of research. It is also about changing professional practice so that those directly or indirectly involved in road safety practice act upon this research evidence. Effective ways need to be developed of getting research into practice across this heterogeneous discipline. This is an important part of training and capacity building referred to in Sections 2 and 4.

The road safety community has a database of effectiveness of measures. It is called MOLASSES and it is administered by TRL. But unfortunately it is not representative of the sorts of schemes that are installed, nor does it give an accurate idea of effectiveness as only those enthusiastic authorities with a good scheme contribute to it. It lists no failures, neither is it representative of costs, a point made further in Section 4. The road safety community needs a new database to replace MOLASSES to which contributions are a requirement of LTP funding and there is a database with a representative sample of schemes of all types and costs.

A4.3 Home Office Research

Limited research has been conducted by the Home Office in the area of traffic policing and vehicle crime with 7 projects relating to traffic policing listed on the website in the period from 1994, with only 2 since 2000. (Home Office Website - <http://www.homeoffice.gov.uk/rds/aboutrds1.html>)

The Home Office Research Development and Statistics Directorate also maintains a number of databases which are directly related to road safety issues (e.g. Motoring statistics and breath-test summary figures). Further research is conducted by the Home Office Police Scientific Development Branch, although research reports are

limited to a project in 1996 (Automated Traffic Enforcement Systems), and in 1998 (Police Patrol Car Livery). In support of this type of research, the DfT have funded a number of projects relating to enforcement, but more on the penalties side, as delivery of policing is not within their remit.

It is clear that there is currently little in the way of research on ways to improve the quality of delivery in road policing (particularly at the strategic/delivery level), and as a result there is perhaps ineffective use of what is essentially a limited resource.

A4.4 References

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Appendix 5: The key factors that influence the scope for casualty reduction in practice

In a highly motorised society in which there are competing social, economic and political concerns and other calls upon public and private expenditure, and in an area of policy where there are technical limits to change, and where change requires contributions from many interests and widespread acceptance by all or large parts of the population, there are six main sources of limitation on the degree of casualty reduction that is likely to be achievable in practice:

- limits on reasonable expectation;
- limits on the means of reducing risk;
- limits on readiness of government to spend on safety measures;
- limits on readiness of interest groups to contribute;
- limits on acceptance by the public; and
- limits on readiness for political intervention.

These are discussed in turn in the remainder of this Appendix.

A5.1 Limits on reasonable expectation

The *Vision Zero* embraced by the Swedish parliament (Ministry of Transport and Communications Sweden 1997),

“the long-term goal ... that nobody will be killed or seriously injured as a result of a traffic accident within the road transport system”,

has been a source of inspiration to those working for road safety and has been adopted by a number of other countries. But it is based on three misconceptions: that striving for continued reduction in risk implies its reduction to zero, that no trading of safety for mobility is acceptable, and that people can be protected from the consequences of any flouting of traffic law (Allsop 2002).

One important element in the thinking behind the *Vision Zero* was a realisation that too much responsibility had hitherto been placed on road users to achieve safe use of a system of roads and vehicles whose design made too little allowance for user error. The *Vision Zero* itself, on the other hand, seems to aim to relieve individual road users of all responsibility for safety in the use of the roads, placing the whole of this responsibility upon vehicle designers, designers and managers of the roads, and commercial operators of vehicles.

Moreover, policies and measures in pursuit of the *Vision Zero*, even if they could all be afforded, would in due course come up against limits of public acceptability, and to try to overstep these limits would be to risk losing a good deal of what had been gained up to that point. So to regard the *Vision Zero* as a practical aim is not only unrealistic, but also potentially counterproductive.

A more pragmatic ultimate vision might be to reduce the risk of death per hour spent using the roads to the average risk while engaging in other everyday activities, so that policy for road safety could be merged into general policy for public safety, rather

than warranting the particular attention it now rightly receives in the light of the current quite disproportionately high risks of road use.

In round figures, there are about 12 000 accidental deaths per year in Great Britain. Of these, two large groups are associated with disproportionate risk per hour: about 3400 that occur on the roads at a rate of about 170 per billion person-hours, and about 2500 that occur to people aged 75 and over in their homes at a rate of about 210 per billion person-hours. The other 6000 or so occur at an average rate of about 20 per billion person-hours, on the basis of 16 waking hours per person-day of which just one is spent using the roads. **Further research could take into account other groups at exceptional risk by appropriate disaggregation of the accidental deaths and estimation of corresponding numbers of person-hours**, but as the relevant numbers of deaths per year are in the tens or perhaps just in the hundreds, rather than in the thousands, this is unlikely to affect the estimate of 20 per billion person-hours greatly.

Thus the risk of death per hour in using the roads is about 8.5 times the average risk in the rest of everyday life, and reducing it to the latter level would reduce deaths on the roads to about 400 per year.

However, the rest of everyday life is spent largely without travelling at speeds greater than a brisk walking pace, from which the human body has evolved to withstand being brought suddenly to rest, whereas use of the roads involves either motion in vehicles travelling much faster than this, or being in close proximity to such vehicles. Using the roads might therefore, even with every reasonable precaution, be expected to carry appreciably higher risk to life than the rest of everyday life.

An alternative comparator is the risk of death in travel by rail, which is around 50 per billion person-hours. Reducing the risk in using the roads to this level would imply reduction to about 1000 deaths per year. This corresponds to the vision “to make road travel as safe as any other mode” suggested by the Directorate-General for Transport and Energy of the European Commission (2001) in its consultation about its forthcoming third road safety action plan.

Such a limit is well beyond what might be approached in the period to 2010, even if the present target for reduction in numbers killed or seriously injured were to be surpassed. But if the target for 2010 is reached with numbers killed reduced in the same proportion as numbers of seriously injured, and an ambitious target for 2020 were then to be set, then the figure of 1000 deaths per year would come within sight.

A5.2 Limits on the means of reducing risk

Risk of death or injury on the roads can be reduced by policies and measures that either reduce the risk of collision (*primary measures*), or reduce the severity of injury when collisions nevertheless occur (*secondary measures*), or do both of these. In The Netherlands, the scope of such policies and measures has been well summarised in that country’s cogent strategy for *Sustainable Safety* (Wegman and Elsenaar 1997), whose title in Dutch would be better translated as *Lasting Safety*. Their scope is there described as being to deliver

- infrastructure adapted to the limitations of the users;
- vehicles adapted to simplify driving and protect people; and

- road users properly educated, informed and deterred;

leading to use of the roads that is

- *functional* in that the use of each road or path is consistent with the functions for which it is designed;
- *homogeneous* in that large differences in speed, mass and direction between vehicles sharing the same roadspace are minimised; and
- *predictable* in that road users are only rarely confronted with the unexpected in terms of road layout or other people's behaviour.

The principal limitations on the means available to achieve these objectives can be summarised as follows:

Even with expensive physical adaptation and skilful management of functions and use, appreciable parts of the existing road infrastructure will fall short of being functional in the above sense, will still from time to time and place to place make greater demands than would be ideal upon the skills of road users, and will still leave open the possibility of severe collisions in some locations and circumstances.

Even with all foreseeable advances in vehicle technology, including those which promise much by way of collision prevention, there will still be room for driver error, and some collisions that give rise to large velocity changes for occupants or struck pedestrians will still occur and be injurious.

Even with the best education, information and deterrence, some road users will still sometimes behave unpredictably, be taken by surprise, be subject to lapses, make errors or act irresponsibly enough to commit offences that give rise to accidents and injury.

It would be a substantial piece of research to make even indicative estimates of the annual numbers of people who would continue to be killed or seriously injured in traffic accidents in Britain after the kinds of changes to vehicles, to roads, to road user education, training and information, and to traffic law and its enforcement that are envisaged in The Netherlands under Sustainable Safety were pursued in Britain as far as would be feasible under the circumstances prevailing here. This would involve examining differences in the vehicle fleet (notably the range of powered two-wheelers), differences in traffic law (for example in priority rules), differences in the acceptability of changes in road user behaviour, and especially differences in the acceptable level of expenditure on adapting the road network and in the acceptable degree of change in the appearance of local roads. Judgements would need to be made about various aspects of acceptability. **It would be a challenging research task, but one that might well be usefully attempted.**

A5.3 Limits on readiness of government to spend on safety measures

In the context of road safety engineering, Evans has estimated (2001) that in the late 1990s the limitations on the resources available to highway authorities in Britain to devote to local safety schemes resulted in criteria for such investment which implied

that at most about £105 000 at 1998 prices was being spent to prevent a death. **It would be very useful to update this estimate, perhaps using data from Annual Progress Reports on Local Transport Plans and their London counterpart.** In doing so, all the costs arising from planning and managing programmes of local road safety engineering schemes, including the costs of design and public consultation for all schemes that are proposed, whether actually implemented or not, should be appropriately attributed to the schemes that do proceed and are being evaluated. Appreciable costs and benefits in terms of travel time and vehicle operating costs (correctly estimated from associated changes in the movement of vehicles) should also be taken into account alongside the value of reductions in accidents and casualties. All these aspects are important, because some estimates of cost-effectiveness of road safety engineering seem to be based on only the construction costs of implemented schemes, which are unlikely to amount to more than one-half, and may well sometimes amount to an appreciably lower proportion, of the total costs arising. Even so, there is little reason to believe that a substantially higher figure than the one estimated by Evans would result.

In contrast, the valuation of prevention of a death that was used in the late 1990s in the appraisal of highway schemes (including local safety schemes) in monetary terms was £1.05m at 1998 prices. If a benefit/cost ratio of at least 1.25 were required from road safety engineering work, to reflect a typical opportunity cost of £1.25 per £1 of revenue raised by the government, this would imply a readiness to invest up to £840 000 to prevent a death, and even requiring the benefit/cost ratio of 3 that is typically required of road construction schemes would imply a readiness to invest £340 000 to prevent a death. As Evans concludes (2001),

“there remains a very strong case for investing more resources in local road safety projects”(p95)

– or putting it another way, it is likely to be a very long time before the scope for cost-effective investment to reduce casualties by road safety engineering is reduced to the level that would correspond to dealing with a trickle of new problems arising from year to year in a comprehensively safety-engineered road system.

This point is reinforced by noting that investment of £50 per resident of Gloucester in the Safer City Project (DTLR 2001) was highly cost-effective (with benefits by the end of the 5-year project period valued at about 4 times the sum invested and continuing casualty reduction benefits to be expected in subsequent years), and investment at the same rate for a population of, say, 40 million urban residents would take about 20 years at the current rate of spending on road safety engineering.

Nor is this simply a matter of allocating more finance. There is already a shortage of the skills required by staff responsible for the management of road safety engineering programmes by analysing potential schemes and progressing them through the consultation and decision process, so that substantial expansion of these programmes requires the training of substantially more such staff, for which practical and cost-effective proposals have been put forward (Allsop 2001) This in turn requires sufficiently evident central and local government commitment to create a highly motivating career structure for such staff.

Up to now, the evaluation of local road safety schemes in monetary terms has been largely in terms of the first year rate of return (FYRR), that is the ratio of net benefits in the first year to cost incurred up to implementation. While the evaluation has been mainly of schemes for which this initial cost represents a large proportion of all costs arising from the scheme, and the benefits can be regarded as accruing steadily over, say, 5 years or 10 years from implementation, and while the main purpose of the evaluation has been to compare such schemes one with another as a guide to order of priority and value for money obtained from different schemes, the simple FYRR technique has served its purpose well.

But the range of types of scheme is widening in such a way that schemes differ substantially in scale, in their likely lifetimes, and in their time-profiles of benefit and cost. With the ending of ring-fencing of budgets, more and more schemes will combine safety measures as such with other design features, and yield accident and casualty reductions as just one of a range of benefits. Interaction with other policies, such as improvement of conditions in deprived areas, will influence the order of priority of schemes that meet the basic criterion of cost-effectiveness. All this means that appraisal will take place in a wider context than that of road safety engineering programmes themselves, which calls for a correspondingly more comprehensive kind of appraisal. The time has come for estimation of FYRR to be replaced for the purpose of evaluation in monetary terms by estimation of the benefit/cost ratio, that is the ratio of present value of benefits to present value of costs, estimated for a common number of years into the future sufficient to cover the expected lifetimes of all schemes being considered. In addition, effects such as those on noise, exhaust emissions and severance, for which monetary valuations for inclusion in evaluation have not yet been agreed, should be estimated and noted for purpose of wider appraisal. These changes would in particular align the appraisal of road safety engineering schemes with that of road construction schemes.

Whichever indicator of cost-effectiveness in monetary terms is used, it is important to promote understanding that, whilst carrying out schemes that yield very high values does indeed represent good value for money, choosing to afford only those schemes that yield very high values indicates neglect in failing to carry out also those schemes which would yield less high but still favourable value for money.

Eventually, if sufficient progress is made in improving the infrastructure, then apart from cost-effective treatment of new risks that arise from time to time through changing conditions in the network, further expenditure on road safety engineering would become uneconomic in terms of benefit/cost ratio. The same no doubt applies to other kinds of spending on road safety, but is less readily quantified because the returns from other kinds of spending are harder to estimate.

An indication of a possible timescale for reaching this limit is provided by the authors of the Finnish road safety strategy (Ministry of Transport and Communications Finland 2001). Notwithstanding their adoption of the Vision Zero, they recognise that if their long-term goal of no more than 100 deaths per year by 2025 (or 75 per cent fewer than now) were achieved then it might “be difficult to achieve a significant further improvement in the road safety situation with today’s tried and tested measures” and “the growing expenditure on road safety may at some stage exceed the costs of other measures that would achieve similar improvements in well-being and

safety”. In terms of deaths per person-year, 100 deaths per year in Finland corresponds to about 1200 deaths per year in Britain, but since the Finnish authors give no details of the basis for their judgement, this does not provide a substantiated estimate of the number of deaths per year at which this limit might be reached in Britain. What might well be a tractable first step towards this would be to **produce an indicative estimate of the reduction in annual numbers killed or seriously injured if all road safety engineering yielding a benefit/cost ratio higher than 3 or higher than 1.25 respectively were undertaken, and what total investment would be required in each case.** In doing so it will be important to distinguish between the scope for road safety engineering in urban and in rural areas.

A5.4 Limits on readiness of interest groups to contribute

Because every substantial economic or social activity makes use of the roads, all stand to gain from reduction in road accidents and casualties, but this does not imply that all stand to gain, less still that all perceive themselves as standing to gain, from every particular road safety policy or measure. For some interest groups, the costs imposed on them, or at least the costs that they perceive to be imposed on them, by a policy or measure may exceed the benefits to them, or at least the perceived benefits to them, of reductions in the risk of accident, injury or death.

It is therefore understandable that particular interest groups from time to time oppose particular road safety policies and measures, even ones which are clearly on balance advantageous to society as a whole. In such circumstances it becomes a matter of judgement for those groups whether to accept actual or perceived disadvantage to themselves for the common good, and where they are not ready to do so voluntarily, it becomes a matter of political judgement whether to require them to do so by legislation and regulation. The latter case is part of the issue of limits on readiness for political intervention that is discussed in Section A5.6. It is in the absence of such intervention that the readiness of the interest groups themselves to contribute can set limits on casualty reduction.

Some such interest groups are to be found among road user groups themselves. Some cycling groups resist encouragement to wear cycle helmets because they see the inconvenience and discomfort of doing so as such a discouragement to cycling as to outweigh the protection from head injury offered by the helmets. Some groups of drivers, while recognising that inappropriate speed is a source of risk, wish more of the responsibility for choice of speed according to circumstances to be left with the individual driver, with less influence exerted by the highway and traffic authority through speed management or by the police through enforcement of speed limits.

Others are to be found among service providers who use the roads to deliver their services. Emergency services whose job is to respond quickly when called to particular sites, and who may be set response time targets, are sometimes among the objectors to installation of speed-reducing measures. Bus operators who wish to offer their customers swift and comfortable journeys may likewise object to safety engineering measures that subject their customers to noticeable detours or to extra acceleration, deceleration and sideways forces.

Some businesses who gain from the sale of alcoholic drinks may resist lowering of the alcohol limit for driving or its stricter or more locally targeted enforcement.

Vehicle manufacturers contribute in many ways to safer use of the roads through technological advances in vehicle safety, but they are understandably strongly influenced by the preferences of their customers. This makes them unlikely of their own choice to modify the design or equipment of their products, even in the interests of safety, in ways that buyers are resistant to paying for. Where they recognise the value of safety enhancements that are not immediately attractive to buyers, they have recognised the advantage of government regulation that obliges all manufacturers to install them to common standards, but they have not always seemed anxious to smooth the path to formulation of regulations requiring them to make their products less injurious, even at very modest cost. This difficulty has been partly circumvented in respect of occupant safety by increasing customer demand for features which enhance this.

The foregoing examples are intended to illustrate how interest groups can limit casualty reduction, and in order better to understand such limits and their potential impact on the road safety strategy, **a useful research exercise would be to make a systematic inventory of interest groups who might reasonably object to foreseeable safety measures and policies and the rationale for their objections.**

A5.5 Limits on acceptance by the public

People go about their lives in ways that they choose, consciously or unconsciously, in response to the circumstances in which they find themselves. It therefore seems sensible to assume that they do not readily change their behaviour at the behest of government, or in response to other advice, including that of specialist experts, of whom the public seem to be increasingly sceptical, unless they are convinced by some consideration of which they were not previously aware. Their use of the roads, which is interwoven in complicated ways into the rest of their everyday lives, is no exception.

Many ways of making safer the use of the roads require changes in the behaviour of road users, either in response to changes in infrastructure or vehicles, or in response to education, training, publicity, or regulation and enforcement. Changes in infrastructure are a matter for government and changes in vehicles are in the hands of the manufacturers, but in each case, progress in implementing changes is influenced by their acceptability to the public. This is evident, for example, in the case of changes to local roads which form part of people's day-to-day surroundings. It is also true of new safety-oriented technology in vehicles: a long-standing example is the seat belt, which had been available for two decades and whose use by drivers and front-seat passengers had been gradually brought to a level of 40 per cent before its use there was made mandatory and the percentage usage doubled almost overnight. Examples for the foreseeable future are black box recorders of the motion of vehicles shortly before collision, and intelligent speed adaptation, for each of which a period of voluntary fitting and use might well create a climate of acceptance for mandatory implementation.

Regulations imposed on all of us as road users, and advice about how to use the roads, will also meet with resistance if they go beyond the current limits of acceptance by the public. It may of course be possible to win over the public to accept something to which they are at first resistant, but this often takes time, and success should not be

taken for granted. Exercise of judgement in such cases is complicated by the role of the media in influencing and interpreting public opinion. Whilst elected representatives are understandably influenced by the media coverage that issues of policy and their associated actions receive or seem likely to receive, they would be unwise to suppose that this coverage necessarily reflects the balance of views held by the public. For example, there are sometimes sharp contrasts between views reflected in the national media and those reported more locally.

It is therefore important to conduct scientific surveys of public opinion to counter any potentially biased representation by the media, and that the resulting information be provided to those responsible for decision making. There is by now a wide range of published results of such surveys related to road safety issues in Britain and other OECD countries, but their findings are widely scattered in the literature and are difficult for the occasional user to bring together in relation to any particular issue. **Elected representatives in Britain, their advisors and the interested public could be helped greatly if an authoritative synthesis and digest of such findings, interpreted in relation to the issues as they present themselves in Britain, could be undertaken and then kept up to date as new and updated survey findings are published.**

At the local level, a number of studies have suggested the importance of monitoring of public opinion when implementing new measures. In the Gloucester Safer City Project (DTLR 2001), research was conducted annually in the form of a public attitude survey. The report states that:

“This has provided a useful baseline from which to measure public responses to consultation. It is well known that people who object to proposals are more likely to make representations than those who support them. The annual survey enables officials and elected members to see how representative responses to consultation are” (p21).

In addition it states that:

“The public attitude survey carried out on behalf of TRL proved invaluable in identifying whether protesters are in a minority. Those opposed to schemes will make themselves heard at meetings and in the local press. While they may have valid views that should be taken into account, it is possible to gain a false impression of the true state of public opinion. The survey helped to identify the silent majority supporting Safer City schemes” (p38).

In the findings of the evaluation of the Bypass Demonstration Project (Department of Transport 1995), this opinion is expressed:

“Against the background of petitions, independent surveys conducted on a random basis by the consultants found substantial support for proposed measures. Whereas petitions can be notoriously misleading (though they should never be ignored) and consultation questionnaires can suffer from a response bias, these surveys, which have generally had a high level of response, were encouraging to elected members whose enthusiasm and

support may have been undermined by adverse reports, particularly in the press” (p38).

While on the one hand the media can have a negative impact on acceptability of various road safety initiatives or measures, they can also play an important positive role in raising support for particular initiatives, and for road safety in general.

Enforcement of road traffic law is an area of particular sensitivity in terms of public acceptance because enforcement has implications not only for casualty reduction but also for wider relations between the police and the public. The findings in the North Report (Department of Transport and The Home Office 1988) concerning the importance of proportionality of enforcement across the wide range of traffic offences, from minor lapses to manifestly potentially fatal disregard of the law remain highly relevant today. These include the conclusion, so relevant to the current issue of camera enforcement, that the objective of reducing death and injury

“amply justifies the police making use of the best available means within the law to deter and detect offenders ... [including] ...using the latest technology ... [targeted] ... as precisely as possible on those most likely to be in breach of the law.”

Raising the public perception of levels and techniques of enforcement of different aspects of road traffic law is another area in which the media can play an important positive role, in this case by improving perception of the danger which compliance with the law is intended to reduce, and of the risk of being caught if not complying.

In relation to particular safety measures, public acceptability seems likely to be influenced by

- perception of the risk against which the measure is directed;
- social acceptance of the behaviour being regulated;
- inconvenience caused by the measure; and
- intrusiveness of the measure into personal lifestyles.

It seems likely in general that with any increase in the perception of danger, the acceptance of a safety measure will increase, because where there is a high perceived level of danger, motorists tend to be more willing to alter their behaviour. This is evidenced in driver speed in busy environments. However, the level of danger is not always clear to road users from the nearby road environment, and one purpose of the concept of the self-explaining road is to inform road users of the level of danger. More generally, in contrast to the massive aggregate cost of road accidents, they are a rare experience or a seemingly remote prospect for the majority of individual road users, the more so as it is known that the majority of drivers overestimate their skill and underestimate the likelihood of an accident happening to them. This under perception of danger makes it harder to gain acceptance for safety measures that have obvious downsides for affected road users.

If a behaviour with a negative effect on road safety is seen as socially acceptable then there is less chance of changing the behaviour than if it is seen as unacceptable. This is the basis for long-term advertising to induce gradual social change. There are

instances where attitudes have changed significantly over time, such as drink driving and seatbelt wearing. At one time, it was socially acceptable to not wear a seatbelt, and longer ago to drink and drive, whereas this is generally not now the case. However, there are other behaviours where an attempt at change has been made but with a lesser impact so far, such as speeding and the wearing of cycle helmets.

The inconvenience caused by safety measures and policies could be said to lie on a continuum, from no discernible effect, through to feelings of severe restriction on desired activity. Tolerance may also depend on the situation (for instance whether a driver is in a hurry). An example is traffic calming, which is a highly effective means for reducing casualties and has shown significant benefit in residential areas, but there are cases in which residents have felt so inconvenienced by traffic calming measures that they have asked for them to be removed.

Intrusiveness is a form of inconvenience that can be felt especially acutely because it affects lifestyle in rather personal ways. Two examples are the wearing of cycle helmets by young children whose use of the bicycle is very close to home and is on the borderline between play and road use, and required carrying of a driving licence by people whose lifestyle is very informal and for whom occasions to drive are unpredictable.

More generally, it may be useful to keep in mind a likely relationship between the sensitivity of people to safety measures and the closeness to home of their impact. At the one extreme, the motorway network is a specialised form of infrastructure, to which there are usually alternatives for those excluded from it or preferring not to use it, and for which limitation of use to fully qualified drivers and exclusion of some kinds of vehicle is accepted. At the other extreme, roads in the immediate neighbourhood of people's homes may be seen as an extension of the home, and restrictions on their and their visitors' use of it may be deeply resented – in contrast to deterrence or restriction of its use by others, which may be welcomed.

Understanding of these various dimensions of public acceptance together with the influence of interest groups and media coverage, and of their relationship to decision-making, is important to progress in casualty reduction, and there can be little doubt that they will limit the range of measures that can be implemented. It is hard to see how to research their quantitative implications in terms of limits on the extent of casualty reduction that can be achieved, but these issues should be kept in mind throughout consideration of the findings of Stage 1 of the Review.

A5.6 Limits on readiness for political intervention

Political intervention is required to make changes to the road infrastructure and traffic regulation within existing legislation, because these are central or local government responsibilities according to the category of road, and to alter traffic law, including powers available for its enforcement, and other relevant legislation. Legislation concerning the construction and use of vehicles is very largely harmonised in the European Union (EU) and therefore decided at the EU level. Traffic law and the powers of highway and traffic authorities are a matter for central government. Political intervention can also influence the priority given by the police to enforcement of traffic law.

Limits on political intervention to reduce casualties are encountered when proposals for action within existing powers or for changes in legislation for which a good case has been made in terms of cost-effectiveness and acceptability in principle nevertheless have insufficient public acceptance or are resisted by influential interest groups or minorities among the public. In such circumstances, the relevant level of government has to choose between the alternatives of awaiting a more favourable climate of opinion, or exercising leadership by going ahead in the face of reluctance or resistance, in the expectation of gaining eventual acceptance.

When government decides, as it is sometimes right to do for the common good, to take action within existing powers or bring forward legislation that moves ahead of public opinion or meets resistance from influential interest groups, careful judgement and skilful tactics are required. Elected representatives could be helped by the research suggested in Section A5.5 to remember that pan-European social survey work has shown (SARTRE-2 1998) that public opinion is often more positive towards road safety measures than decision-makers believe. Kåre Rumar advocated (1999) in the first European Transport Safety Lecture that well-founded measures should be marketed and initial public rejection should not be regarded as immutable.

Readiness to move ahead of public opinion is one aspect of political commitment to road safety. Demonstration to the public of such commitment needs to differ from its demonstration to road safety professionals. Experience in The Netherlands in the mid 1990s showed that just as fund-raisers can generate donor fatigue, so the public can become weary of continual rehearsal of the road safety message. Judgement is needed how frequently to reinforce it and how best to refresh it – and this applies to statements from politicians just as much as to other means of communication. In contrast, professionals engaged in road safety work seem to need and value frequent reassurance of continued political commitment to the strategy and targets and to keeping up a matching flow of resources.

At the local level, experience has shown that cross-party political support for road safety programmes is one of the most important requirements for success. Implementing measures will not always be popular, so it is vital that road safety remains a high priority with the elected representatives in the face of periods of public criticism and even possible loss of votes. A political ‘champion’ can be very helpful in maintaining support for a road safety programme through such periods.

At all levels, it is important for professional advisors to keep up to date the case in support of measures which are for the time being ruled out by elected representatives, because the political moment for bringing forward such a measure can arrive suddenly and unexpectedly – a classic example being the rapid succession of multiple-vehicle accidents in fog on the motorways which provided the political opportunity to introduce, initially for an experimental period, the motorway speed limit and accompanying national speed limit on rural roads in the mid-1960s.

A5.7 Issues for research and policy

This Appendix has highlighted some important issues relevant to how far the road safety community can go in reducing the level of death and injury on the roads without some fundamental changes to the way in which priorities and policies are perceived. Two strands have been identified: one is what extra needs to be known to

take the road safety effort further forward and the other is issues of policy. The research issues have been highlighted in the text of this Appendix and are repeated in Section 5. The main policy issues arising may be summarised as follows:

- Road safety should be championed and rise up the political agenda so that an ultimate vision might be that eventually the risk of death per hour using the roads may be reduced to the average risk whilst engaging in other everyday activities, or at least to the average risk of travel by rail, and policy for road safety could be merged into general policy for public safety.
- In the case of road safety engineering schemes all costs arising from planning, designing, consulting upon and managing a programme at the local level should be included in any cost-effectiveness calculation. The costs of schemes designed but not implemented should be apportioned appropriately amongst those that do go ahead. For larger road safety engineering schemes, effects on travel time and vehicle operating costs should be taken into consideration in evaluation in monetary terms and the benefit/cost ratio should replace the first year rate of return as the indicator of cost effectiveness. In addition, social and environmental effects such as severance, noise and exhaust emissions should be included in wider appraisal so bringing into line appraisal of these schemes with that of road construction schemes.
- There is an acute shortage of staff with the necessary skills to undertake the management of road safety engineering programmes. More action needs to be taken by both central and local government to address this.
- Some interest groups hold positions that lead to resistance to the introduction of safety measures known to be successful. Ways need to be sought to engage these groups to identify their motivations in operating levers that they hold, and additionally to identify decision makers' perceptions of these mechanisms.
- Possible changes in policy and practice are influenced by their acceptability to the public. In general the public are not well attuned to the risks of using the road and sometimes resent regulation and changes to road layout that are not in accordance with their perception of the risk. The under perception of danger is an area which needs to be tackled if public opinion is to swing behind measures that cause a degree of inconvenience, loss of time or intrusiveness. To help policy makers gauge the range of public opinion, and judge when to exercise leadership by moving ahead of it, scientific surveys should be undertaken more frequently and their findings brought together more effectively than at present.

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