Strategies and targets for reducing death and injury in road traffic accidents

Abstract

Use of motor vehicles is a major contributor to accidental death and injury. Society's response involves government, business and a range of professions, as well as all of us as individuals. There are good reasons to expect the extent, effectiveness and cost-effectiveness of action throughout society to reduce death and injury in road accidents to be enhanced by such action being integrated within a road safety strategy, and by those concerned being motivated by being involved in the setting of challenging but achievable targets for casualty reduction. British experience with a national road casualty reduction target set in 1987 for the year 2000 has led to recent work within an integrated transport policy to develop a road safety strategy incorporating a casualty reduction target for the year 2010. The formulation of this strategy and the setting of the associated target is being based upon forecasts of how numbers of casualties would be likely to change by 2010 under various scenarios for use of the roads and without new action for casualty reduction, accompanied by assessment of the probable effectiveness of such new actions as are likely to be implementable between now and 2010. At the supranational level, the European Union has published a road safety strategy demonstrating how action at that level can add to what can be achieved by individual Member States and more locally. This is a step towards meeting the relevant requirements of the Treaty of European Union.

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When half a million people are killed each year in road accidents world-wide, there can be no dispute about the need for action to prevent and control injury on the roads. Indeed, the history of such action is at least as long as that of the motor vehicle, and one of the strongest reasons for confidence that much more can be done is that so much has already been achieved. The scope and nature of action to reduce death and injury in road accidents is continually evolving as research and experience increase understanding of the problem and of ways of addressing it. One recent development is the realisation of the potential value, within a national, regional or local jurisdiction, of setting the whole range of such action in the context of a road safety strategy owned by all the main contributors to injury prevention on the roads by virtue of their full involvement in its formulation.

Societal responses to the problem of road accidents

Among the many and varied ways in which societies adjust to the increasing use of motor vehicles are a range of responses to the problem of road traffic accidents and their consequences. People outside motor vehicles get used to keeping out of their way, and people using them learn to do so with greater care and skill, and learn to keep them in better condition. Manufacturers of vehicles and those who maintain them grow in recognition of their responsibility to make and keep them safer. Providers of the highways grow in a similar recognition. Emergency services recognise the new demands placed upon them by the occurrence of injury in traffic accidents. A market for insurance against the consequences of accidents develops. Moreover, public concern leads to political recognition that much that could be done to reduce the resulting death and injury is against the perceived interests of individuals or firms, or beyond existing powers and resources available to public bodies, and this in turn leads to government intervention by way of public information, exhortation, legislation, regulation and allocation of resources. The scope of legislation, regulation and professional effort extends beyond the design and use of the roads to the use of sites and buildings, and their layout in respect of access from the highway.

In addition to the responsibility of each one of us for trying to use the roads safely, therefore, professional and ethical responsibility for injury prevention on the roads is spread widely over many kinds of people in a range of commercial, professional, governmental and community organisations. Some of these have duties defined explicitly in road safety terms, others have roles that are defined in other ways but have quite obvious road safety implications, and yet others may not realise how much their activities can influence road safety unless this is brought to their attention by suitable advice or training.

Different kinds of action for road safety are interdependent in many ways. They also

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compete for resources, most explicitly in the allocation of government expenditure and in management decisions in business, but also in individuals' decisions about their use of time and money for travel and for vehicle ownership and maintenance.

Some aspects of this interdependence and competition are naturally recognised and addressed by those concerned, but this does not necessarily happen to an extent that is commensurate with the scale of avoidable death, injury and damage in road accidents. The range of people and interests involved and the complexity of the interdependencies and tradeoffs in use of resources are such that a more systematic approach is called for.

Government intervention in the interests of road safety has tended to become progressively more systematic, leading for example in Britain to the adoption of a casualty reduction target (1-3) and a commitment to back this up with a strategy (4), in Sweden to the vision of a transport system in which there are no fatal or serious injuries (5), and in the European Union to the adoption of a strategic approach 6). But government intervention can be effective only if it is matched by the efforts of non-governmental organisations and by the population at large.

The value of adopting a road safety strategy

The value of setting the whole range of road safety action in the context of a strategy lies not only in the existence, and in due course largely successful implementation, of a coherent program of concerted action of all kinds, but also in the effects on the participants of being fully involved in the process of formulating the strategy and keeping it up to date. This process, if it is conducted in a way which achieves the full involvement of all those who can contribute to making use of the roads safer, can deliver:

- a rationally based consensus on an agreed program of action;
- motivation and commitment on the part of all from whom contributions to its implementation are required;
- a framework within which contributors can each plan for their contribution to the action;
- explicit identification of synergies and tradeoffs with public policy in other areas;
- coherence and persuasiveness in gaining acceptance of the envisaged action, and enthusiasm for its success, on the part of the public and of business;
- a firm basis for cross-party political will to allocate the required public expenditure;
- ranking of actions in terms of cost-effectiveness to inform their sequencing within budgetary constraints having regard also to equity among different beneficiaries; and
- a clear framework for monitoring the effectiveness of different actions and progress of the program to inform the continual updating of the strategy in the light of experience and changing circumstances.

Because road safety action is typically a highly cost-effective use of resources, making this explicit in the strategy should lead to greater allocation of resources to it, and thus to more action than without the strategy. Systematic consideration of interdependencies within the strategy and the enhanced motivation and commitment of the contributors should make the action more effective, and ranking in terms of cost-effectiveness should make the sum total of affordable action more cost-effective, than would be the case without the strategy.

Progress towards a strategy in Britain

On coming to power in May 1997, the new British government inherited a national casualty reduction target for the year 2000 dating from 1987 (1,3), the results of a consultation exercise indicating strong approval for a new target beyond 2000 (7), but no national road safety strategy. It brought with it a manifesto commitment to a new integrated transport policy with an emphasis on sustainability, or rather reduction in unsustainability, upon which it soon launched a national consultation exercise leading to a white paper published within 14 months of election (8). In advance of the drafting of the white paper, however, the government announced in October 1997 that the integrated transport policy would include a road safety strategy that would have as its focus a new road safety target for the year 2010. The announcement said that the government had concluded in principle that:

- the target should be a national one for reducing casualties;
- there should be one subtarget for fatal and serious casualties (about which there is most concern) and another for slight casualties; and
- progress should be monitored every three years – in particular so that assumptions made when the target is set can be re-examined.

The second of these conclusions reflects the fact that since the target for 2000 was set in 1987 the annual number of slight casualties has remained stubbornly high, despite a reduction of more than 40% in the number killed or seriously injured. The third is sensible on general grounds but is all the wiser because of uncertainty about the potential under the integrated transport policy for increasing walking, cycling and the use of public transport at the expense of growth in car use.

This announcement was accompanied by a shorter and a longer paper (4,9). The shorter paper (4) summarised the starting point, in terms of progress towards the target for 2000 and existing road safety policy, for development of the strategy. It identified 5 main problem areas: excessive and inappropriate speed, drinking and driving, novice drivers, protecting vulnerable road users, and reducing slight injuries, together with associated broad lines of action. The longer paper (9) set out in more detail how the strategy was to be formulated and the new target set.

Immediately after the announcement, the government's Department of the Environment, Transport and the Regions set up a Strategy and Targets for Accident Reduction Group (STAR), including representatives of a number of the main road safety interests outside government, to advise the Department. Subgroups of STAR have examined what can be expected between now and 2010 from a range of approaches to injury prevention.

The most fundamental of these is to reduce exposure to the risk of involvement in traffic accidents – but not at the expense of the freedom to travel and thereby have full access to social and economic activity. The integrated transport policy (8) has mixed implications in this respect: on the one hand it envisages less car use and lorry traffic than would otherwise have been expected, which should reduce exposure to risk both for users of these vehicles and for other road users, but on the other hand it envisages considerable increases in walking and cycling, thus increasing exposure to risk for those travelling by these means unless substantially safer conditions can be created for them. One contribution to the latter is likely to be particular emphasis on reducing levels of motor traffic in locations where interaction with pedestrians and cyclists is greatest. For any given level of walking and of use of the various kinds of vehicle, exposure to risk can be reduced by encouraging drivers and motorcyclists to use roads where the risks to themselves and to pedestrians and cyclists are lowest, and encouraging the latter to use routes where they encounter less motor traffic, and encounter it in less dangerous circumstances. These are matters of urban design and road safety engineering, including selective road construction and extensive traffic management with an emphasis on safety.

For any given pattern of use of the roads, the levels of risk of accident involvement to which the users are exposed as a result can be reduced mainly by adapting the roads through road safety

engineering treatments of high-risk sites, routes and areas, and by adapting the manner of use. The latter can be achieved not only by informing road users and influencing their attitudes, but also as one of the effects of adapting the roads and, in the case of vehicle users, their vehicles. Influencing the manner of use of the roads is expected increasingly to be an objective of road safety engineering, with particular emphasis on moderating the speeds of motor traffic, creating safer conditions for walking and cycling, especially for children. Urban roads in general and single-carriageway rural roads are likely to receive particular attention in this respect. In terms of influencing drivers, those who drive after drinking, novice drivers and those who drive cars for long distances and for large parts of the day in the course of work are likely to receive particular attention.

Measures to reduce the risk of accident involvement will also tend to reduce the severity of injury in those accidents which nevertheless still occur. Severity of injury to occupants of motor vehicles is likely also to be reduced by further improvements to occupant protection and by making roadsides more forgiving to those who run off the road. There is also scope for designing vehicles to be less injurious to pedestrians and cyclists that are struck by them; this applies to heavy lorries as well as to cars. Severity of injury to cyclists could be reduced by persuading more of them to wear helmets, and for motorcyclists, most of whom in Britain wear helmets, improved design of helmets could provide added protection.

Another subgroup of STAR is making recommendations for numerical targets and subtargets on the basis of forecasts of casualty numbers for 2010 under various scenarios for changes in the amounts of motor traffic of various kinds, cycling and walking without new action to reduce casualties, and estimates of the likely effectiveness of policies and measures of the kinds just discussed. Ministers have decided that the strategy should be further informed by a comprehensive review of traffic speeds and their impacts (10), taking account among many inputs of the findings (11) of the recently completed European collaborative study MASTER (Managing the speeds of traffic on European roads). In the light of this, the strategy and target should be published towards the end of 1999, and in the meantime it has been indicated to local government, which is required to take account of the target in new local transport plans under the integrated transport policy (8), that the target for reduction in fatal and serious casualties by 2010 will not be less challenging than one-third compared with the average for the last five years.

Progress towards a strategy for the European Union

Some aspects of the legislation put in place by the European Union (EU) over several decades as part of the development of the Single European Market have also benefitted road safety, notably the harmonisation of regulation of hours of duty for coach and heavy goods vehicle drivers, and of the standards for construction and use of motor vehicles. The former reduces driving of large vehicles by drivers in a state of fatigue, and the latter has helped to impose higher standards of occupant protection upon the multinational car industry.

It was, however, not until the Treaty of European Union in 1993 that a general duty in respect of transport safety was recognised in European legislation, and the EU was empowered to act in this area whenever its actions could be shown to give added value over and above what Member States can achieve individually (i.e. consistently with the principle of subsidiarity).

In anticipation of this, a High Level Group appointed by the Commission of the European Communities (CEC) had concluded (12), among other things, that road safety should be made an active EU policy, experience should be shared among Member States, databases should be made more consistent and combined, targets for casualty reduction should be set and progress towards the targets should be monitored. Also in anticipation of the 1993 treaty, a CEC white paper on future development of the Common Transport Policy (13) contained a commitment to the presentation of a Community program on road safety, proposing an integral approach based on qualitative targets and the identification of priorities.

A limited three-year action program was introduced in the following year (14). This established the Community databank on road traffic accidents known as CARE (15), but consisted otherwise mainly of further action on construction and use of vehicles, a number of measures concerning movement of dangerous goods, and research projects concerning possible future action, especially in the area of telematics. By 1995, a general program to develop the Common Transport Policy (16) had called for a 'global approach' to road safety, and in successive safety-related reports the European Parliament had called for a numerically targetted approach.

Against this background, the European Transport Safety Council (ETSC), an international non-governmental organisation providing impartial advice on transport safety matters to the CEC and the European Parliament, began to call upon the EU to adopt a road safety strategy including a numerical target for reduction by 2010 in the annual number of deaths in road traffic accidents (17). It went on to produce its own 'Strategic Road Safety Plan for the European Union' (18), according to which the EU should, in respect of road safety,

"within the principle of subsidiarity ...

- provide a focus for thinking and activity throughout the EU
- legislate in areas of exclusive and shared competence
- promote best practice through:
  - exchange of information
  - the issuing of guidelines for voluntary adoption to assist road safety professionals at local, regional and national level
- add to knowledge through data collection and research"

and should set a target of reducing the annual number of deaths in road traffic accidents in the EU to less than 25,000 by 2010, compared with 45,000 in 1995. Advocacy of such a strategy was supported by a detailed overview of feasible measures which together offered the prospect of achieving this target.

The CEC's 1993 action program included a commitment to evaluate the results of the program after three years. In fulfilment of this commitment, and influenced by development of thinking in the intervening years, including the ETSC's advice, the Commission has produced a further program of action for 1997-2001 (6). This focuses on a criterion that expenditure on road safety should be regarded as cost-effective if the cost is less than one million Euros for each fatality prevented, on the assumption that proportionate amounts of non-fatal injury and of damage are also prevented. It is argued that continuation of current action for road safety at the local, regional, national and EU levels subject to the one million Euro criterion could reduce the annual number of deaths on the roads of the EU to less than 27,000 by 2010. Against this background, a three-pronged strategy is proposed, comprising:

- gathering and dissemination of information and best practice through an EU road safety information system;
- accident avoidance measures, i.e. primary safety measures, with an emphasis on influencing road user behaviour and the use of telematics; and
- reducing the consequences of accidents when they occur, i.e. secondary safety measures, especially vehicle design standards, consumer information about the safety characteristics of new vehicles on the market, and making roadsides more forgiving.

The CEC thus stops short of setting a target that challenges those responsible to achieve more than the continuation of current action

can be expected to deliver. The one million Euro criterion also needs to be interpreted with care. A review by the ETSC (19) indicates that one million Euros under-estimates by a factor of 3.6 the value to society of preventing one death and proportionate amounts of non-fatal injury and damage in road accidents. As it happens, however, 3.6 is in the same ballpark as the ratio of benefit to cost that typically justifies public expenditure in the transport sector under prevailing budgetary constraints. Thus, the one million Euro criterion could be helpful if it is taken to warrant implementation of a measure under current budgetary constraints. If, however, it were to be taken as an indication of the social benefit of preventing one death and proportionate amounts of non-fatal injury and damage, it would lead to damaging underestimation of the value to society of expenditure on road safety.

Conclusion

Those who have adopted or are in the process of adopting road safety strategies are still learning how best to do so, and it remains for future monitoring and evaluation to determine the exact extent and nature of the benefits that will result. There are, however, strong indications that the formulation and implementation of strategies has real potential to enhance the effectiveness of injury prevention and control on the roads, and where the responsible authorities are persuaded to adopt this approach, it is important that all those who share in various ways in the injury prevention effort should involve themselves wholeheartedly in the process to maximise its likely success.

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