National STRATEGIC ROAD SAFETY PLANS

Code of Good Practice

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NATIONAL STRATEGIC ROAD SAFETY PLANS

CODE OF GOOD PRACTICE

Recommendations for national road safety plans
made by PRI's Technical Forum
Working group on
Road Safety Plans; Code of Good Practice

MAY 2000

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PRI
La Prévention Routière Internationale
International Road Safety
Internationale Verkehrssicherheit

Cover Source: Association Tunisienne de la Prévention Routière - ATPR

FOREWORD

The Executive Committee decided at its meeting in Rome on 26th May 1997 to create a new organisational structure of PRI. The Technical Forum is a part of this new structure of PRI and is composed of all categories of members: active, affiliated and individual.

The aim of this forum is to create an efficient synergy between research and practical application.

One of the tasks of the Technical Forum consists of identifying road safety problems on the basis of existing research work. Proposals for action are submitted to the Executive Committee, which can create working groups consisting of members interested in the topics proposed, which are co-ordinated by a rapporteur who is in close contact with the Secretary General.

The members of the Technical Forum are nominated by the Executive Committee.

The task of this working group is to create a code of good practice for national strategy and road safety plans.

Another task is the development of a framework to be used at the national and regional level and also by the local communities.

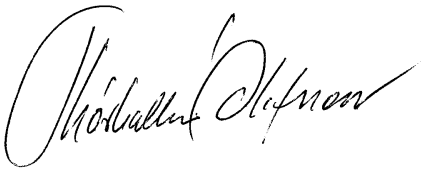
This framework has to be completed by national road safety bodies and adapted to their own conditions and culture.

Ideas such as intensification of networking with partners other than transport, education and public works (e.g. justice, police, social partners, and infrastructure including both roads and vehicles) should also be dealt with.

Chairman of the
Technical Forum

Drs Matthijs KOORNSTRA

Chairman of the
Working Group Road Safety Plans;
Code of Good Practice



Mr Thorhallur OLAFSSON

April 2000

WHY ROAD SAFETY PLANS AND TARGETS?

Approximately 700,000 people are killed in traffic accidents every year in the world according to OECD statistics. This is an unacceptably high price to pay because it is an unnecessary sacrifice. Traffic accidents are becoming a modern epidemic.

Fortunately, many countries are now fighting this problem and have in recent years significantly brought down the number of persons injured and killed in road accidents. The key to success in most countries is a dedicated coherent road safety programme with a time frame and quantified targets for the reduction of fatal and serious accidents. Road safety plans can be a very rewarding and profitable investment.

Achieving the most ambitious result will call for will, collaboration and commitment between all parties involved in road safety work. Everyone is responsible: The members of the government, national, regional and local politicians, public and civil institutions and associations, private companies, drivers and other road users. No progress can be expected without strong political initiative and support. Therefore it is recommended that all nations set themselves a realistic road safety programme and follow it to the end. The goal set must be achieved.

Annual discussion of the road safety situation at the highest political level is necessary to maintain the consistency of the plan and evaluate what progress has been made towards the goal that has been set. Working and implementation schedules should be updated regularly (every year). Road safety plans must be rewritten every 2–4 years. Road safety plans should basically concentrate on a few key points, rank tasks in order of priority and work on a broad basis with the involvement of many parties.

The general idea of making a Code of Good Practice for road safety plans is to make a working tool for PRI member countries and other interested countries, to make similar plans. It seems to be true that countries which have implemented such plans are more successful in improving road safety.

Several countries have already made their own National Strategic Road Safety Plans (NSRSP). It is noted some similarities exist between such plans. The purpose of this document is therefore to identify good practice and disseminate it to countries that are about to start the process.

This document contains examples of road safety plans that can be useful as a framework for those who are making or revising existing NSRSPs. This document is available in printed form and on the PRI website.

Working group "Road Safety Plans; Code of Good Practice"

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1 THE PROBLEM

1.1 PROBLEMS PERCEIVED – DATA COLLECTION AND ANALYSIS

Public perception of danger on the roads frequently does not coincide with the reality of where accidents happen. So, for example, in many countries motorways are believed to be dangerous although in fact they are by far the safest part of the road system (measured in casualties per million vehicle- kilometres.) It is therefore important that any policy to reduce casualties be developed from the facts. This means that accurate data about actual accidents must be collected. A judgement has to be made on which accidents are to be recorded and in how much detail. There are obvious resource constraints on the agency collecting the data and on the ability to analyse it. However, the use of computer-based accident analysis packages (such as the TRL MAAP system) can make the task of manipulating the data easier. Typically, countries attempt to collect data about all accidents in which one or more persons are injured.

The range of data collected about each accident varies from place to place. From the perspective of improving road safety, the more data the better, but filling in report forms is time-consuming. If the form is too lengthy or complex it is likely that the data will be incomplete or inaccurate. The more data that is available about any particular accident, the easier the task of identifying causal factors. No accident has a single cause and whilst some road users are more responsible than others for causing an accident, in almost every case all the parties involved could have taken actions that would have stopped the accident happening.

Appendix 1, *Road accidents as "chains of events"*, contains two examples of how accidents occur. The first example explains the factors leading up to an accident. The second example explains the reason why many accidents occur with a single common causal factor.

Whilst the chain of events leading up to each accident is unique, many accidents will have common causes. So, for example, excessive or inappropriate speed may be a factor in up to a third of all accidents in some countries. Whatever other factors are involved, reducing speed could eliminate many accidents. The common factor may be site specific (such as left-turning accidents). Simple and inexpensive engineering treatment will remove that cause and hence eliminate the accidents.

1.2 USING AND ANALYSING THE DATA

In most countries, accident data is collected by the police. This data does not cover all accidents. The data collected by the police is mostly juridical based. More attention should be paid to gathering relevant information on how to prevent similar accidents later on.

It has to be accepted that a completely accurate and comprehensive database of all accidents is not achievable, although it must be an objective. However, the lack of the perfect database should not stop effective data analysis.

THE DATA TO COLLECT

The Road User	-	Age, sex, behaviour, type; pedestrian, cyclist etc, severity of injury, presence of alcohol or drugs, wearing of a seatbelt or a helmet and purpose of journey. Fatigue is also an important factor.
The Vehicle	-	Type, age, safety devices
The Road	-	Type, speed limit, location, junction type, urban/rural, surface, residential area, traffic flow.
Others	-	Time of the day, day of the week, date, weather.

Analysis of imperfect data is greatly preferable to a subjective assessment of road safety problems. Cost of accidents and casualties by road user type and severity. (Accidents involving vulnerable road users tend to be more severe, and hence more expensive, than accidents in which vehicle occupants are injured.)

The figures thus derived can be used to estimate the total costs of road accidents in a country. It is typically in the range 1-2% of GNP.

From analysis of the data it is possible to identify causal factors. So, for example, an accident involving a single vehicle running off a road is likely to involve excessive speed. Use of the location data will enable accident concentrations (at single sites, along a route or in an area) to be identified. Further analysis of common factors will allow the development of remedial measures.

To ensure the maximum benefit from the data it is necessary to cross correlate as many of the variables as possible. For example, comparing age and sex of drivers with time of day and day of week will identify those times when the young male driver problem is particularly severe. Looking at time series will identify those accident types that are changing in importance although care needs to be taken if exposure data is not available; a decline in cyclists' accidents might simply be because the number of people cycling has dropped. An analysis looking at heavy goods vehicles will be likely to show the disproportionate severity of accidents involving heavy vehicles, for example trucks.

Whilst the particular causes will vary from country to country, common issues include:

- Speeding
- Young drivers
- Overloading
- Condition of roads
- Inexperienced drivers
- Mobile telephones
- Drunken driving
- Intersections
- Condition of vehicles
- Drunken road users
- Fatigue
- Seatbelts
- Other safety measures

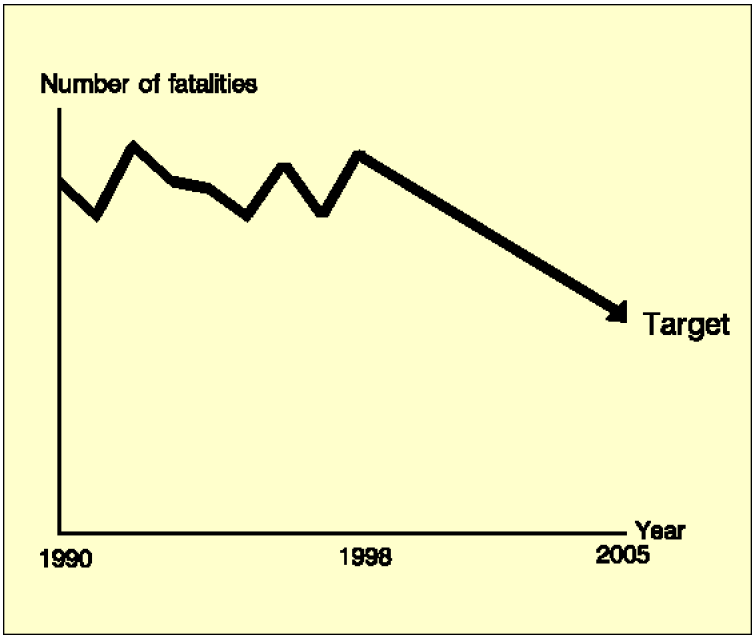
A further important source of studying road accidents is to compare the casualty records of countries with similar levels of motorization and of GNP per head. It is often possible to identify significant differences and further investigation can quickly identify solutions.
List of GNP from every PRI member country and level of motorization.

2 VISION, OBJECTIVES AND TARGETS

Road casualties are often perceived as a natural disaster, but some countries have proved that this is not the case. Therefore our vision must be that at some time in the future, no one will be killed or injured in road accidents. However, this is a long-term aim and in the interim we must settle for a more modest objective.

Vision zero

In the short term, quantified targets are an excellent way of measuring progress. The target might relate to casualties or deaths, e.g. to reduce the number of deaths by 50% over the next ten years.



Setting targets is a way of focusing minds and efforts. It should not be regarded as an exact definition. It is rather an expression of a common desired goal. For a target to be successful it has to be clear and easily understood. A sensible target would be to reduce the number of vehicle occupant casualties per hundred thousand inhabitants to a specified level.

Whilst targets must be demanding, they should be achievable. It is important that targets will be set by responsible politicians at the highest level. Only then will the sufficient resources necessary be made available. Measures to reduce road casualties are remarkably cost effective, often producing high rates of return. Much can be done by improving the way existing funds are spent, but it is likely that some extra funding will be necessary for some special road safety measures. When targets have been set at a national level they can then be desegregated for use by lower levels of government. They should set their own targets, consistent with the national target, reflecting their ability to deliver results. They might set targets for different road user groups. In many countries it has been recognised that walking is a form of transport that has been greatly reduced because of safety hazards.

Therefore it might be desirable, for example, to set more rigorous targets for the reduction of pedestrian casualties. There is a danger, however, that changes in exposure could reduce the actual number of casualties whilst the risk is increasing.

During the monitoring of progress towards a target it may become apparent that it is going to be met or exceeded. Then it can be replaced by a more rigorous target. However the reverse is not true. Replacing an existing target with an easier one will be perceived as a betrayal and those working in the field will be demotivated.

All the evidence suggests that ambitious quantitative targets are likely to have the greatest effect on policy makers and hence produce the best results.

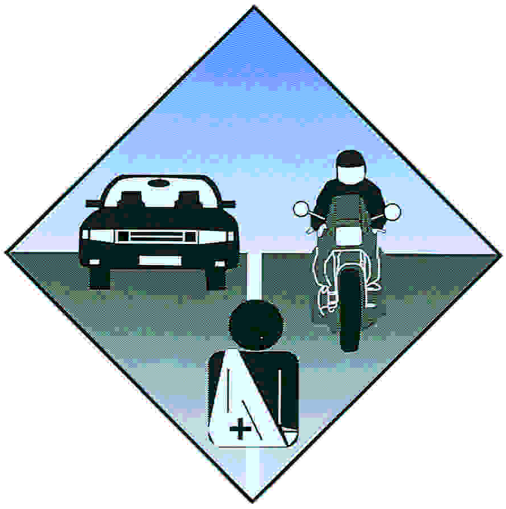
3 STRATEGY AND TOOLS

THE STRATEGY

3.1 Deciding on measures and priorities

There will never be sufficient funds or other resources to implement all the measures that might be taken to reduce road accidents. Decisions have therefore to be taken as to which particular measures will be implemented first. Whilst it might seem sensible to act first on those individual measures that make the greatest reduction in casualties, this might not be the best course to take. Each selected approach should be cost analysed and the number of casualties that it might avoid estimated. In some cases it can be difficult to decide upon likely casualty reduction benefits. This seems particularly to be true for education and publicity. These measures are primarily focussed on influencing the level of knowledge, attitudes and behaviour. Extrapolation to the reduction of traffic accidents and victims is not always easy. However, sensible assumptions can be made. If, for example, it is assumed that child pedestrian training will save 1% of child pedestrian casualties, a figure can be derived.

Once the likely number of casualties to be avoided has been produced, a "cost per casualty avoided" figure can be established. The measures can then be ranked in order of cost effectiveness. In practice it not always possible to adopt an entirely rigorous approach to this selection because other factors impinge upon it, but it does introduce an element of objectivity into the process.
When the cost of a casualty has been established it is then possible to derive a cost benefit ratio comparable with those used, for example when deciding whether to build a road.



In general, road casualty reduction measures are of an order of magnitude larger than other potential investments for government and are frequently the most cost effective way of spending the taxpayers' money.

3.2 Setting a timetable

There needs to be a clear detailed timetable of work from the start. However, care should be taken, especially in the first year. There is a natural tendency to believe that we can achieve more than we actually can. In the first year it is important to get the systems in place to ensure smooth running in future years. For presentational reasons, it is valuable to have something dramatic happening early on so that the public can see that things are changing.
An example is the time-relatedaction plan in New Zealand.

A) LEGISLATION

- Road traffic rules
- Signs, signals and markings
- Vehicle construction and use of regulations
- Vehicle registration
- Driver licensing
  - Penalty points system (Demerit points)
  - Probationary and temporary driving licences
- Use of safety equipment
  - Seat belts – Helmets – Lights

B) COMMUNICATION / MARKETING

- Awareness campaigns
- Involvement programs
- Information
- Ensure that all arms of the organisation are aware of the road safety implications of their actions

C) EDUCATION / TRAINING

Formal education

- curricula - primary and secondary schools
- driver training (incl. moped, motorcycle)
- accompanied learning
- continued training (centres etc.)
- teach the teacher/instructor (manuals etc.)
- rehabilitation-programmes (alcohol, drugs, speeding and other offences)

Informal education

- parents, peergroups
- youth clubs, other meeting places
- internet, computer games, ,,call and win"

D) ROAD ENGINEERING

- Safety audit systems for roads
- Safety engineering for roads
  - Black spot treatment
    - single sites, routes, areas, mass action
  - Urban safety management
  - Infrastructure around school areas
  - Traffic calming

E) ENFORCEMENT

- Targeted enforcement
- Automatic enforcement

F) VEHICLE ENGINEERING

- Vehicle standards
- Vehicle inspection
- Random roadside control
- Ensure that all arms of the organisation are aware of the road safety implications in their actions.

G) MEDICAL SERVICE

- First aid
- Emergency services
- Trauma centres

3.3 Counter-measures

It is widely recognised that excessive speed is now a major cause of road deaths in many countries. A policy to reduce this problem should include the use of many tools in a concerted way.

Legislation. Introducing speed limits is a comperatively cheap way to deal with the problem of speeding. But speed limits alone have at best a limited and temporary effect on the choice of speed by the driver.

Speed is related to mobility and the feeling of freedom. Speeding is therefore fun. To prevent drivers from speeding it is not sufficient to stress the risks or negative effects of speeding. A focus on the benefits of adapting the speed to appropriate levels is needed as well. To deal with the problem of speeding, a balance should be found between drivers' compliance to speed limits and enforcement of the rules.

Over time, drivers become more aware of the reasons for speed limits and of the desirability of obeying them. It may then be possible to introduce lower limits with little or no self-enforcing measures. As the proportion of speeding drivers diminishes, penalties can be increased, reflecting public concern about the issue.

Communication and marketing. To communicate with road-users it is important to raise their awareness of the speed problem and to get their involvement to adjust their speed to the relevant circumstances.

The application of (social) marketing principles could be very beneficial. Social marketing attempts to discover different needs and motives of people and to link them in a positive manner to traffic safety. It encourages road-users to make traffic safety one of their personal objectives, so that they no longer view safety measures as rules imposed from above, as is now often the case. Furthermore, social marketing is directly linked to behaviour and behavioural changes.

The more attractive safety measures are for the road-users, the more compliance and observance can be expected from them (See OECD-Report on Social Marketing and Road Safety. Annex 2). In the communication process, the message should be simple and repeated regularly.

This process might take years and maybe in the first period no substantial effect on the actual speed will be measured at all (see OECD-Report on Effectiveness of Campaigns. Annex 2).
Public attitude surveys will give an insight as to whether the process is working. Within the first few years, drivers should be recognising that excessive speed is dangerous, that an adjusted speed has benefits and that if they slow down safety would be improved. Publicity has the additional benefit of preparing the public for more direct interventions that might otherwise prove unpopular.

Education / Training. The dangers of inappropiate speed can be include both in schools curriculum and in driver training. Overtime a generation of children and young people will grow up and believe that excessive speed is dangerous in the same way as in many counries it is now believed that drinking and driving do not mix. Attention to this issue must be given in outside school education as well Internet, parents, computer-games, peergroups, rehabilitation-programmes are useful instruments to deal with speedoffenders.

Road engineering. There are many safety engineering measures for reducing drivers' choice of speed, the most obvious being 30 km/h zones with associated traffic calming. These measures can be introduced incrementally and if drivers are made aware of the dangers of speeding, it should not produce the discontent that might otherwise arise.

Enforcement. Speed cameras are a very effective measure for achieving adherence to the speed limit at particular sites. However, they can be unpopular and may

be vandalised. Again, a public understanding of the reasons for introducing them helps. To be effective it is necessary to give tit for tat. Rehabilitation-programmes and measures linked to the driving licence (pointsystem) are interesting follow-ups of enforcement-activities

Vehicle Engineering / Technology. At present, the possibility of putting speed limits on cars is politically impracticable. However, over time, as the majority of drivers understand the benefits of lower speeds both in casualty reduction and in other ways, it may become possible to require their introduction. Intelligent speed adapters could be beneficial in the near future. Speedlimiters and cruisecontrol-equipment have a positive contribution to roadsafety

Medical Safety. Roadsafety-activities should be primarily aimed at the prevention of road-accidents and victims. Nevertheless everyday accidents will happen and victims are to be regretted. Active and passive safety devices can help to reduce the gravity of the injuries. In this respect a well organized medical service will have a positive contribution as well. Every second counts.

3.4 Research

When developing a strategy, the areas where our knowledge is lacking rapidly become obvious. Sometimes these can be filled from experience in other countries. The latter is particularly true of the "harder" engineering or technical approaches. For areas such as education or publicity, care needs to be taken in transferring knowledge. Differences in social and cultural background may mean that what works in one country will not necessarily do so in another country. It is vital that researchers and policymakers have a reasonably reliable expectation of the outcome of different possible packages of counter-measures if money is not to be wasted.

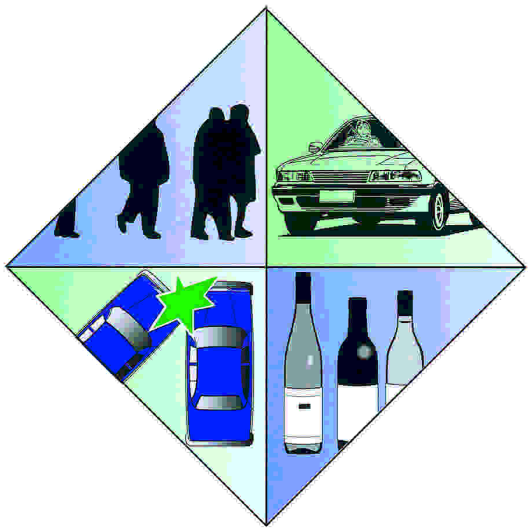
(See Annex 5: Traffic Research Institutes.)

3.5 Funding

The particular way that a road safety plan is implemented will vary from country to country, and whilst much can be done for very little, a successful implementation will require identified and substantial funds. In some countries this has been achieved by earmarking a specific proportion of taxes on road users or of fine revenue for road safety activities. It might be possible, for example, to impose a small levy every time a car is registered or when a driving test is taken. If central government allocates relatively small amounts of money to local government or to schools to support the strategy this can generate extra funds locally.
New ways should be developed to realise public and private financing. The business community can accept its social responsibility by providing financial support. Companies can adopt roads by financing the infrastructure and/or they can finance special projects (sponsorship).

4 WHO DOES WHAT?

Who does what? Every country has a different network and infrastructure. It is therefore important to identify who does what and who is responsible for each area in road safety work. But co-operation between all parties involved in road safety is vital for success.



4.1 Politicians

For any road safety plan to succeed, political support is essential. The support of the relevant minister is, of course, essential, but the support of the government as a whole is to be preferred. Many ministries will be involved in either implementing the plan or making decisions that have an impact on road safety. Similarly, at the regional and the local government level, wide-ranging support, preferably from across political parties, is needed.

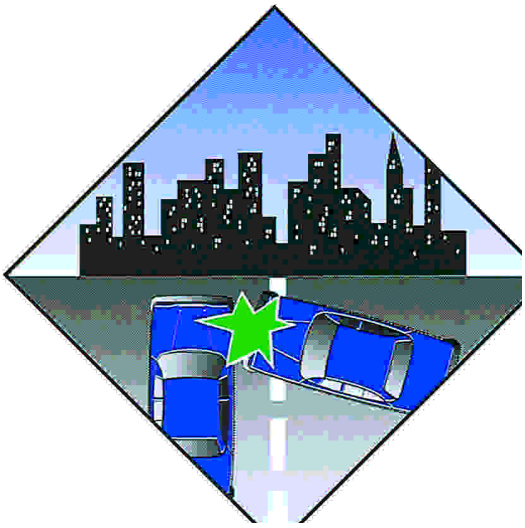
4.2 Administration

Road safety targets and plans are more likely to be achieved when them enthusiastic officials and civilservants are charged with implementing them. Difficulties inevitably arise between these officials and those with other responsibilities. The aim must be to ensure that a "road safety culture" spreads through the organisation so that decisions in other areas (environmental and urban planning, social services, health, etc.) are not taken without consideration being given to the road accident consequences. How this is achieved will differ from country to country. Many have found that a Road Safety Council, especially with executive powers and revenue, is a useful tool, although this has not been proved in every case.

4.3 The private sector

The active support of the private sector is vital. This will range from direct safety-related activities in support of the strategy from insurance companies and the media to support without specific activity from other sectors. The private sector can be an invaluable source of sponsorship, although the level of this will vary with the state of the economy. Road user groups (NGO's) such as traffic safety associations, touring clubs and other active groups can provide invaluable support, as they can speak to their members in a language they understand.

- Non-Governmental Organisations (NGO's)
- Traffic safety associations
- Insurance companies
- Automobile Associations
- Mass media
- Other stakeholders, enterprises.



4.4 Project manager

There need to be clear lines of responsibility and a clear knowledge of who is in charge. It is worth considering appointing a single person to ensure that the plan is running to the timetable and that the relevant people and institutions are co-operating towards the goal set. The project manager should report on progress to date (both good and bad) and propose future work.

4.5 Research and scientific institutes

Reasearch institutes in the field of road safety, universities and other institutes play an important role in developing and implementing a road safety strategy with matching counter-measures. They can contribute to the different cycles of policy (from analysis up to evaluation). Relevant data be collected and elaborated. This can be utilized on the global level (strategy, targets) and on the detailed level (effect of counter-measures).

4.6 Engagement

When developing the road safety plan it is important to ensure that a wide range of bodies and individuals are included. If they have a feeling of "ownership" they will be more likely to support implementation actively.
Involvement, motivation and engagement are key concepts in the process of reaching the widely accepted targets. Joining forces and creating synergy between the activities of the various stakeholders is vital. This gives life and soul to the whole process of improving road safety.

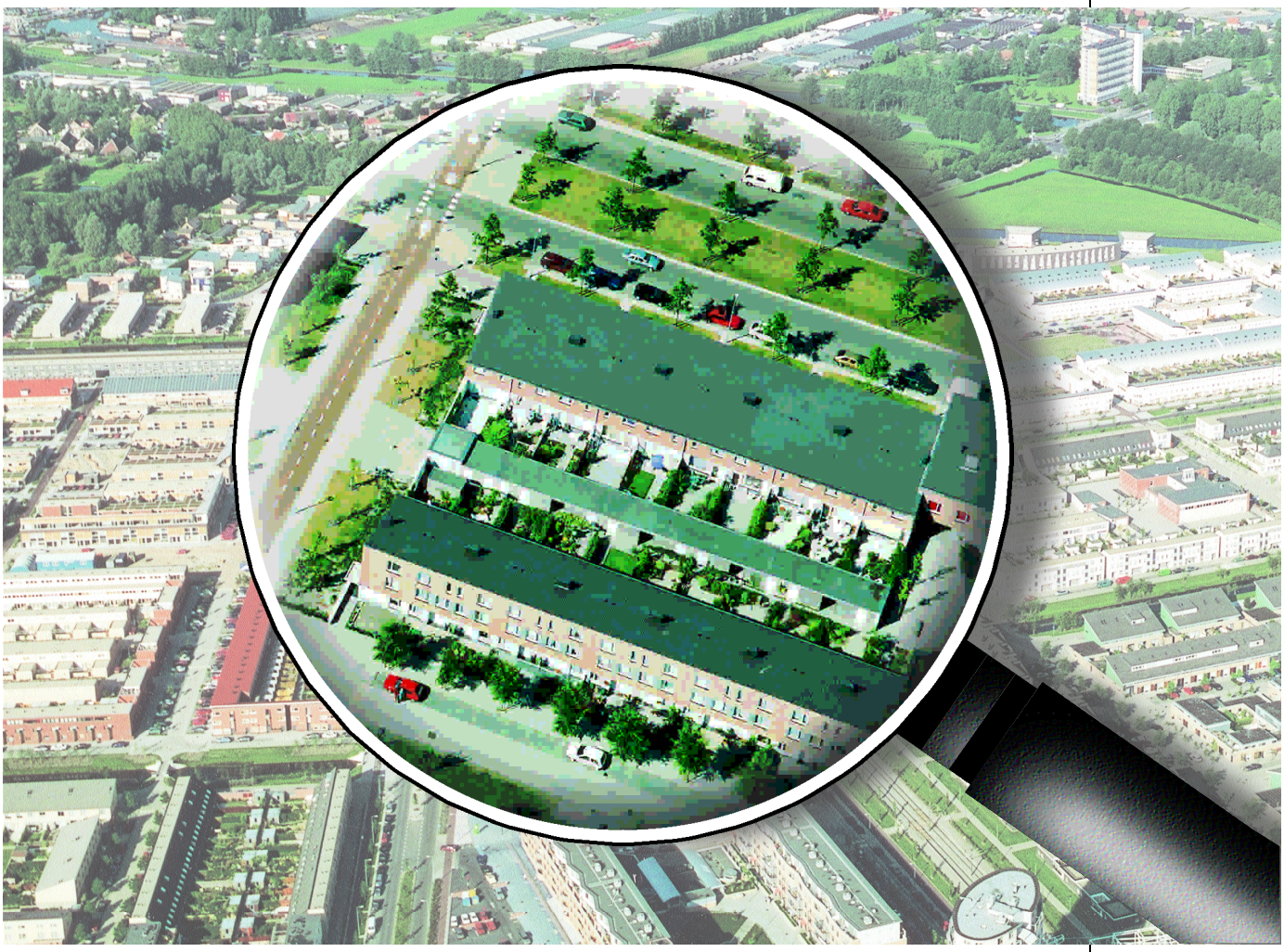
5 FROM WORDS TO DEEDS

Having decided on the general outlines of the strategy for reducing accidents and the number of victims, it is a good idea to produce a published document setting out what is planned. Before starting work on this it is necessary to consider who are to be the recipients of the plan. If the document is intended for the public in general then it will not function as a working document for the people implementing the plan.

The document should be simple and clear. Nowadays it is so easy to produce tables and diagrams on the computer that the risk exists of an overflow of statistical information about the existing situation. This can overshadow the key purpose of the plan, which is to to give guidelines on what we are going to do in the future. It is a good idea to have a detailed work programme set out for the first year.

The plan will inevitably be amended over time as experience is gathered and new techniques are developed. A formal review process should be established on a regular, annual, basis. It is desirable for the revised programme to be agreed at the political level to ensure continuing political commitment to the process of accident reduction. During the process of evaluation it is possible to become disheartened by an apparent lack of progress, especially as regards changing driver behaviour in traffic. Reducing road accidents is a very longterm project and experience shows that it takes several years for the effects of training and publicity to be seen in actual behaviour. In the short term, the easiest gains are achievable through low cost roadengineering measures.

6 EVALUATION



It is vital that progress be monitored regularly. Where the target is to carry out a specific number of tasks within a year, this is simple. If the target is to reach a particular level of performance (such as a rate of use of seat belts), surveys can establish the effect. For casualty targets it is unlikely that any changes will be statistically significant in the first twelve months, but a check can provide a useful guide to how things are going. Particular care needs to be taken with site-specific engineering treatment where the total numbers are so small that a threeyear "after" period is the minimum necessary to measure reliable effects.

Failure to achieve the expected result can be a spur to further efforts. When the results are disappointing it is necessary to establish what went wrong so as to modify or change the strategy for future years. Similarly, where a particular initiative achieved a higher than predicted, casualty reduction can result in modifications to the overall programme.

However, any well thought out road safety plan will contain mistakes and the process of amending it must be continuous.

Road accidents as "chains of events"

The human environmental and vehicle factors referred to above are considered to form the links in the "chain of events" which lead up to the point in time when each accident occurs. Each "chain of events" is therefore unique. Figure 1 illustrates this concept.

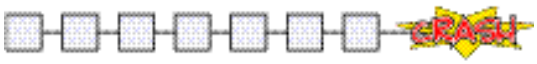


Figure 1

This aspect of the nature of road accidents can best be demonstrated by example.

Example: Outline of circumstances leading to an accident

- *A traffic consultant has been promoted to a post above his personal ability.*
- *This person experiences an unusually difficult day at work.*
- *On the way home the consultant collects a car from the garage where it has been serviced and is irritated by being forced to wait.*
- *Upon arriving home the rest of the household has gone out for the evening.*
- *Rather than eat alone, the consultant decides to go to a public house nearby for a snack.*
- *In the pub are two friends that the consultant has not seen for some time.*
- *In a relaxed atmosphere they all drink a little more than they intended.*
- *When they come out of the public house they find that it is raining after a long dry spell.*
- *The consultant offers to take the others to their homes, as they have not brought their coats.*
- *They laugh and joke about past experiences and the consultant feels more cheerful and relaxed.*
- *The consultant does not pay much attention to the task of driving.*
- *They enter a tight bend with adverse camber faster than the driver first realised.*
- *The consultant touches the brake pedal to reduce speed.*
- *The brake shoes have not been adjusted evenly during the service earlier that day.*
- *One brake shoe grips and the rear end breaks away in a skid due to the polishing of the road surface during the long dry spell coupled with the adverse camber.*
- *The driver panics and over-corrects the skid.*
- *The car slides out of control and collides with an old large base-concrete lighting column set immediately behind the kerb on the outside of the bend.*

Immediate outcome: The front seat passenger dies from injuries sustained in the collision.

The above example underlines how a variety of factors can come together to create a situation in which one or more persons fail to cope as road users with their environment. The driver may well have safely negotiated the bend at the same time and in the same road and weather conditions as those when the accident occurred, but with little or no risk of comparable accident, simply because certain factors were absent from that driver's "chain of events".

When considering a group of accidents at a particular location as a series of events in time, it must be remembered, that each "chain of events" is, in its entirely, unique. However, the clustering of similar accidents is indicative of the likelihood that one or more road and environment factors may well be "links" which are common to several of the "chains of events".

Figure 2 illustrates the multifactor nature of each accident in a group and how some factors may be common to the circumstances of several of those accidents. The accident investigator commences with only the basic data available from the accident reports and, after verifying those data, seeks to understand the main composition of each chain of events from site studies and access to police reports and files.

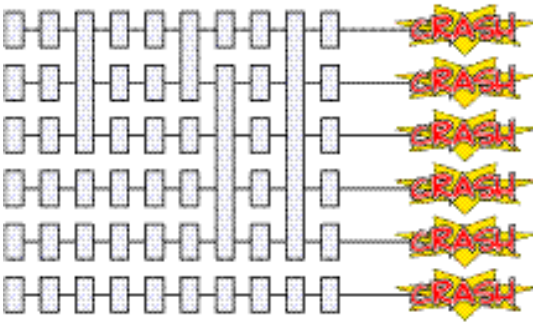


figure 2

The reconstruction of each chain should readily allow for further facts to be inserted, and the main aim should be to identify one, two or three factors which are common to several accident circumstances and which can be "treated", i.e. removed from the site or altered so that they do not feature in future chains. (figure 3) It should be remembered that it is impossible to identify all of the links in each chain and that the main aim is to identify the presence of those links which relate to the road and the environment and are also common to several accident chains.

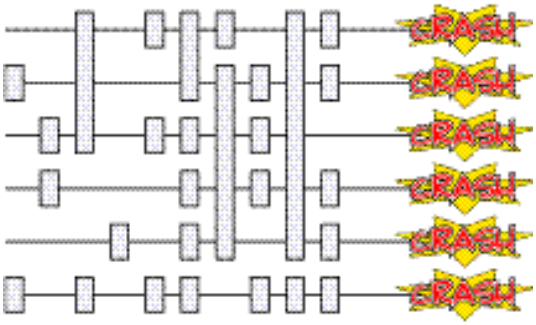


figure 3

Remove the common factor and the accidents will not happen.

Source: Transport Research Laboratory - TRL

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