

Targeted road safety programmes: a promising approach in road safety

Paper presented at 'The second Conference on Asian Road Safety', Beijing, October 28-31, 1996

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1. Introduction

In 1594 the first tulip bloomed in the famous Hortus Botanicus at Leyden University, a flower which was imported from Turkey. Nowadays the Netherlands is well known because of its flowers and its bulbs. Every year nine billion flower bulbs are produced in my country.

Sandy soils and mild western winds under the shade of the North Sea dunes turn out to be excellent conditions for flowers and bulbs and there you find those flower fields of outstanding beauty. However, some shades are caused by pesticides and fertilisers, which are commonly used and cause environmental problems: emission of ammonia, phosphates and pollution of the groundwater. So, it has to be admitted there is more than just the beauty of the tulip and the flower-fields.

The Netherlands, and especially the western part, is one of the most densely populated countries in the world, which means that it is quite vulnerable for environmental problems. For this reason the Dutch Government, together with the flower and bulb sector tries to reduce the environmental problems. In a policy programme named 'Multi-year Programme Crop-protection' policy targets are mentioned: volume reductions of 42% by the year 1995 and 61% for 2000 of pesticides and fertilisers have to result in emission reductions of 30-70% by 1995 and 50-90% by 2000. This target has induced other targets. For example due to fertilisers: Natrium -77%, Phosphate -100%, Kalium -55% and NH₃ - 100%.

It is normal practice in many, many fields to formulate targets and to implement policy to reach these targets. To give only one other example: to enter the European Monetary Union all Member-states of the European Union have promised to head for the following aims:

- to reduce the financial deficit of the public sector to less than 3% of the annual Gross National Product;
- to reduce the debtquote to less than 60% of the annual GNP or 'satisfying reducing' it;
- to reach a rate of inflation which is smaller than 1.5 than the mean rate of three Member-states with the lowest inflation.

This paper gives a broad overview on targeted road safety programmes, mainly based on the activities of a so-called OECD scientific expert group, whose report has been published in 1994 (OECD, 1994). Some recent developments will be discussed as well.

2. Why road safety targets?

Every year, worldwide about 500,000 people are killed in road accidents (Wegman, 1995). The anticipated growth of (motorised) mobility on a global scale will, without effective road management, lead to an increase in the number of fatal accidents and injured people. *From experience we know that the problem of road accidents is not unassailable.*

In many OECD countries, the number of road accident fatalities and casualties reached an all-time peak level around 1970. During the subsequent years, great progress was made in many countries in bringing down the number of fatalities and casualties even with a further growth of mobility. During the last decade however, the decline in the number of fatalities and casualties has slowed down. The stagnation of further improvement of road safety, in a situation of a steady growth of mobility, could be explained by diminishing effectiveness of road safety measures. In most countries, a number of uncontroversial and easily implemented countermeasures have been introduced. It is becoming increasingly difficult and expensive to further reduce the number of fatalities and casualties in highly-motorised countries.

Where known and effective measures have been taken to improve road safety, as is the case in a great number of OECD countries, the future policy will be directed, on the one hand, towards improvement of the effectiveness and efficiency of the existing road safety measures. This maintenance is necessary in order to prevent achievements gained in road safety being eroded. Examples: speed limits, drinking and driving, use of seat belts.

On the other hand, new policies will have to be developed. At present it is experienced in many countries that these new policies more often focus on measures which encounter difficulties during introduction, on which the road safety experts cannot reach agreement regarding the contents, where the effectiveness also in relation to the costs is not clear, where implementation requires co-ordination and integration with other policy areas, etc. In the coming decades road safety policy appears to be more complex than before; easy measures have been exhausted.

In view of these expectations, it is exceedingly important that in the future road safety problems will be recognised and dealt with and that political and social support will be obtained for further improvements in order to reduce to a minimum the social costs caused by unsafe roads. Besides, it is of increasing importance that the available limited means (funds and man - power) will be used optimally.

Every country in the world would like to reduce the yearly toll due to road accidents and are compelled to improve road safety. The present numbers are considered unacceptable everywhere. But what tasks could countries set themselves when one is aware of the expected population growth, economic growth and, consequently, mobility growth? One of the most promising answers seems to be to set road safety targets and to implement targeted road safety programmes.

3. Road safety targets and targeted road safety programmes

In *road safety targets*, it is essential to indicate specifically the road safety indicator used. Most of the time, the number of registered fatalities or casualties are used. Furthermore, a goal has to be defined. When goals are quantified (with explicit time and level components) these type of goals are defined as targets. Road safety targets could be considered as a reflection of the devotion of a society to commit itself to improve road safety seriously. Road safety targets can be seen as the balance between idealism and realism, because targets should be realistic as well as acceptable.

Targeted road safety programmes should not only use well-defined targets, but should also show how to reach these targets (i.e. which policies, which countermeasures, which actors involved, how much money is needed and who provides it). This rational approach of policy making demands a problem definition and thoroughly implemented problem analysis. A clear link has to be established between content and nature of the problem and how to solve the problem.

Two different approaches could be used to define targets: a top-down approach and a bottom-up one. In a top-down approach the target is set first. The target must be attractive enough to be adopted by politicians. Such an adopted target legitimises the policy process (manpower, funds, etc.) for measures to be taken. It is to be hoped that enough effective measures will be or become available.

In the bottom-up approach, all relevant data and information have been collected and an assessment has been performed leading to a realistic target. This approach is by definition a realistic approach and is to be recommended when a rational approach was chosen, but to accelerate road safety policy the top-down approach could be advisable as well.

When a targeted approach has been chosen, a combination of the top-down and bottom-up approaches will be normal practice because this looping will make it possible to choose between realism and idealism.

4. Advantages and drawbacks of road safety targets

The underlying intention of target setting is to ensure that road safety would be assigned a (more) prominent place in the decision making process *over a period of years*. By declaring its commitment to this task, Government imposes an obligation on itself. The process of coming to a decision to use road safety targets could raise public interest to improve road safety and could create support in the population and among public and private organisations to contribute to reaching the target.

Another benefit of the targeting process could be quality-improvement of the road safety policy. Targets demand that plans must be developed in order to realise the tasks set. *Targets lead to targeted programmes*. This induces better use of scarce public funds and other resources and it improves the credibility of programme makers, i.e. the Government and politicians. This policy, in turn, may influence public acceptance of road safety measures positively.

Targeted safety programmes create pressure to monitor and assess recent development and road safety programmes and, therefore, to continue effective programmes and stop ineffective ones. In addition, plans that in themselves are not orientated towards a safety goal but are expected to affect the level of safety must be assessed on the basis of the task set and adjusted if necessary. A target could open new avenues which will be closed otherwise.

Two arguments are mentioned sometimes against the concept of targets and targeted programmes. The first one is that it is hard to decide what target to set, because targets have to be realistic and idealistic (challenging) at the same time. Another drawback might be that when a target is achieved, it must have been too easy and if it is not, those who are responsible are confronted with political loss of face. However, neither in Sweden nor Britain this has caused difficulty when a target has been achieved ahead of time: it had just been an encouragement to set a stiffer subsequent target (Allsop, 1996).

5. Road safety trends

Comparing the number of fatalities and casualties with the number of inhabitants can be considered as a public health indicator - a measure to compare different threats to life. A second road safety indicator relates the number of fatalities and/or casualties to the number of kilometres travelled. This measure indicates the safety quality of a road system. The first indicator is also known as mortality rate or personal safety, the second one as fatality/casualty rate or index of traffic safety.

It is fully possible to reduce both rates when the number of fatalities-/casualties are increasing. But, it is not acceptable to conclude that road safety has improved when both rates are decreasing and, at the same time, the number of fatalities and casualties increase. *Because of this, it can be understood why politicians tend to conclude to use absolute numbers of fatalities and/or casualties when using road safety targets.*

In Europe downward trends are seen in most countries over the last twenty years, with some exceptions in the south and, due to drastic changes in recent years, also in the East. However it can not be concluded that all rates are about the same. One can distinguish enormous differences between different countries which could not be understood easily. Many countries have found it difficult to continue downward trends.

A relationship has been established between the development in mobility and road safety (Koorstra, 1993). On the basis of empirical data from various countries, the conclusion has been reached that on a macroscopic level the annual number of road deaths can be expressed as the product of mobility (motorised kilometres) and the fatality rate (deaths per kilometre). Both factors can be expressed in terms of monotonic trends: a logistic, sigmoid trend in the case of the number of kilometres that approaches a certain saturation level and an exponential curve in the case of the fatality rate. A cyclical fluctuation should be added to this. It emerges that if the fluctuation in the increase in mobility leads to a sharper increase than that based on the monotonic trend, the reduction in the fatality rate is relatively minor. This is disadvantageous for the development of road safety on two counts: the sharp increase in mobility and the moderate drop in the fatality rate. From the point of view of road safety, this calls for a controlled increase in mobility and should this increase be high, for example due to a strong economic growth, then extra attention should be devoted to road safety measures with the aim of further decreasing the fatality rate.

This relationship connects transport and infrastructure policy and road safety policy directly. Moreover, this relationship could be used when setting (realistic) road safety targets.

6. Road safety targets

Various countries claim to have quantified targets. Three types of targets are mentioned. Some countries define targets in terms of activities achieved or facility improvements, e.g. hours of police forces in enforcement or number of blackspots improved. One can define this type of target 'administrative' targets and this type can be considered as the lowest level possible. The second possibility are targets in terms of change of human behaviour, e.g. percentage of drinking and driving, use of seat belts ('process targets'). The last and most commonly used target deals with the absolute number of fatalities and injuries, sometimes in relationship to the number of kilometres travelled in road traffic ('product targets'). Road safety targets are most of the time defined in terms of absolute number of fatalities or injuries.

Some countries have derived road safety targets from public health targets. This type of target setting was induced by the World Health Organisation in their report 'Health for all by the year 2000', in which the WHO sets a target of minus 25% for all sort of threats to public health. Especially Australia uses this approach. In The Netherlands targets are combined for growth of mobility (to restrict this to an increase of 35% by 2010, compared with the growth in the no-policy scenario of 70%), environmental targets (particularly air pollution an emissions) and road safety. In Denmark five years targets are used. In Australia different states use different targets.

The time frames for the targets are either about 3-5 years or the end of the century (up to ten years). When longer time frames are used, some intermediate year is used, like in Denmark where they divide the twelve years in three periods or the Netherlands where they use fifteen and twenty-five years. The annual rate of reduction varies between zero (Norway) and 5% (Finland and Denmark). Keeping in mind the correlation between growth in mobility and reduction in accident rates, differences are to be expected.

Reviewing the use of target setting in different OECD countries, three categories of approaches could be distinguished. First the large countries with a very decentralised social and political system, use targets at a very general level. Federal government leave implementation of policy to Regions, Provinces or States. Examples are Australia, Germany, Canada and the USA. Second, countries which do not have quantified targets but who consider it desirable to establish them. Finally, a number of countries which have established quantified targets dealing with the overall national numbers of casualties. In this category a number of relatively small countries are represented, with the best road accident statistics of the world but facing a stagnation in safety trends: the Netherlands, the Scandinavian countries as well as the UK.

Road safety targets sometimes lead to disaggregated targets. For example, in the UK disaggregated targets were set for user groups and for regions, in the Netherlands for vulnerable road users targets are set but also some behavioural targets are set for safety belt usage and for drinking and driving. This is also the case in Canada. Another approach was chosen in Finland where targets were set for accidents on national roads.

One of the interesting questions with respect to targeted road safety programmes is whether the provision of a national road safety target will be able to produce more and better road safety work on the regional and local level. A national Government is not in a position to reach a national road safety target with its own policy. Road safety is a matter of co-operation and setting up national targets and national plans seems to have a stimulating effect on local and regional authorities' road safety efforts.

7. Institutional changes

A major question of road safety targets and targeted road safety programmes is whether they improve either road safety policy decisions and/or the likelihood that policies will be implemented. The conclusion can be that an abundance of evidence is available that road safety targets improve policy decision making. Road safety targets mobilise the road safety community to produce broader road safety plans, to integrate the efforts of different actors and to more realistic programmes. However, to give road safety a higher position on the political agenda as a result of target setting was not a conclusion of the OECD-group. To summarise, targeted planning provides a rational basis for national agreement on priorities and enables all those involved in the process to understand their programme responsibilities and to see whether the planned objectives are being met.

Road safety targets and targeted road safety programmes induce monitoring of trends and evaluation of countermeasures. A lot of methodological problems have to be solved in these evaluation studies as 'normal' problems related to policy research (successes are more wanted than failures) and related to road safety research (small numbers of accidents, short after-period, no real control group, etc.). The results of evaluations are generally fed back into the process of planning road safety programmes. Nearly all countries have a formal system of periodic revisions of these programmes, also based on outcomes of evaluation studies and this feedback of newly gained knowledge might be considered as a fundamental point for targeted road safety programmes and which makes these programmes, at least theoretically, superior to other, less rational, types of policy.

8. Examples of targeted road safety programmes

To illustrate these general findings from the OECD study on 'Targeted road safety programmes', examples are given from three countries in some more detail: from Finland, Sweden and the Netherlands.

With regard to the Nordic countries, road safety in Finland is at a considerably lower level than in Norway and Sweden and approximately the same level as in Denmark. The Parliamentary Traffic Committee has set the road safety target to reduce the number of road deaths by half from the level of 1989 by the end of the 1990's. After reaching this goal Finland would be at the same level as the other Nordic countries, provided that they reach their own goals.

To reach this road safety target a decision was taken to start the preparation and implementation of a lot of measures during 1993-1996 in order to reach the target. These measures are headed under the following titles: reducing growth of vehicle mileage, improving safety of pedestrians and cyclists, driver training and the driver's test, vehicle safety, information about road safety, reducing accidents caused by the influence of alcohol, traffic supervision and consequences of violations, speed regulation, regional and local safety and a special program for national roads. A formal procedure for implementation, co-ordination and monitoring has been introduced, where the Ministry of Transport and Communications will report to the Council of State about the progress of the programme.

In 1994 a National Road Safety Programme for the period 1995-2000 was published in Sweden (Rumar & Stenborg, 1994). The main components of this programme are ten road safety reforms of which quantitative goals are formulated (for example: reduce speed violations by 35% until the year 2000, to increase the use of safety belts and child restraint systems to 95%, increase the crash worthiness index for cars by 12%, increase the proportion of pedestrians who use reflective devices to 50% in the urban area). If all the objectives for the different reforms are fulfilled, the total effect is estimated to 20-25% fewer fatalities and 15-20% fewer serious injuries compared to the present situation. The total annual costs are estimated to be around USD 90 million. So, we see here a combination of 'process' and 'product' targets. The preparation of the Swedish programme has been done by the Swedish National Road Safety Administration, the National Swedish Police Board, the Swedish Association of Local Communities together with many other organisations and road safety experts.

In the Netherlands a 'Long term policy for road safety' (Ministry of Transport, Public Works and Water Management, 1991) is part of the so-called Transport Structure Plan. In this plan the time frame is 2010. In this plan transport goals, environmental goals and road safety goals (-50% fatalities and -40% injuries in 2010 compared with 1986) are formulated in an integrated way using quantitative targets. Every few years recent trends are related to the targets. In 1991 this led to the following conclusion: 'Under the present policy, when enhanced, it is theoretically speaking still possible to achieve the goals for the year 2000 and 2010. But, we are running behind schedule. Since 1985 the previous annual reduction in the

number of victims has come to a halt. Without a sharpening of the current policy now, we will not achieve either our goal for the year 2000 or the goal for 2010. To bring the road safety targets within reach again, a dual policy approach has been chosen. First of all, the spearhead policy that is already having some effect, must be sharpened.

Secondly, the approach to road safety must be changed to a more preventative approach with the aim of producing a so-called 'Sustainably safe traffic and transport system'.

It is interesting to note that the very recent Dutch Road Safety Programme 'Suit the action to the word' (Ministry of Transport, Public Works and Water Management, 1996) has been built along the same lines as in Sweden. Members of Parliament have invited the Coordinating Minister for Road Safety to react on the disappointing developments of road accident casualties since the second half of the eighties, compared with the road safety targets. SWOV has analysed these developments and has tried to find the underlying causes. Moreover, SWOV offered in a study a variety of possible countermeasures on the short term (to 2000) and the longer term (to 2010) to reach the road safety targets. The Coordinating Minister has invited around seventy organisations, institutions, etc. to help in preparing this road safety programme and by doing so, to collect support for the implementation of this programme. The Dutch Parliament will discuss this programme at the end of 1996. It is quite evident that the disappointing developments of the number of road casualties in the Netherlands, related to the targets, induced political pressure to come up with new initiatives to improve road safety.

9. Good practice in targeted road safety programmes

From the evidence available, it cannot be concluded that targets automatically improve either programme planning or the likelihood of accident reduction. So far, only one study has reported effects of (quantified) road safety targets (Elvik, 1993). This study deals with the safety performance of Norwegian counties where quantified road safety targets were set against counties with only qualitative targets. The best performance was achieved by counties with highly ambitious quantified targets. Elvik concludes that the main implication of this study is that setting ambitious quantified road safety targets can help policy making by making it easier to implement effective countermeasures and set priorities effectively.

However, a number of the features of targeted programmes encourage good practice in programme planning. Clearly formulated road safety targets can guide policy-making in a far better way than less clearly formulated road safety targets. However, more research is needed how setting targets can best help policy-making. A careful monitoring of targeted road safety programmes is needed in order to make rational decisions and, if necessary, about the revision of road safety targets and the accompanying programmes and to explain policy performance.

It is useful to provide a description of road safety trends and the forces underlying them. A systematic description of road safety problems can help in identifying vulnerable road users or high risk groups that need special attention. The potential offered by various countermeasures for improving road safety should be assessed, as the effects of confounding factors. Balancing between realism and idealism targets could be set and alternative plans of action. It is good practice to monitor and evaluate targeted road safety programmes and to report on this at least annually.

An outline of good practice for targeted road safety programmes has been presented in the OECD report (OECD, 1994). See also Read (1995). *A targeted road safety programme is based on a clear target and consists of a set of countermeasures designed to reach the target.* The following steps are distinguished:

- *Analysing accident trends and road safety problems;*

It is useful to provide a description of road safety trends and the forces underlying them, both in order to understand past changes and to gain an idea of how road safety may develop in the future. A systematic description of road safety problems can help in identifying vulnerable road users or high risk groups that need special attention in a road safety programme.

- *Assessing the potential of countermeasures;*

Assessing the potential of the various countermeasures requires knowledge both of their effectiveness and the target group. Although this knowledge will either be lacking or highly uncertain, it is considered good practice to estimate their potential. The theoretical safety potential can rarely be fully realised. Practical, political and economic obstacles

are always present and realistic road safety programmes should address the implications of these obstacles.

- *Assessing the effects of confounding factors;*
Exogenous factors affecting safety are always present and their implication for road safety policy-making should be addressed as well.
- *Setting the targets;*
Clearly formulated road safety targets can guide policy-making in a better way than less clearly formulated road safety targets. Highly ambitious quantified road safety targets can help policy-making, but there is no guarantee of that the desired results are obtained.
- *Formulating alternative plans of action;*
In order to find the least costly alternative, alternative plans of action should be examined systematically. The phases involved should generate different alternatives, estimate cost-effectiveness or a cost-benefit ratio per countermeasure and construct a cost-effective programme.
- *Monitoring and feedback;*
The careful monitoring of targeted road safety programmes is needed in order to explain policy performance and, if necessary, to revise the targets and/or the plans and programmes. Monitoring is crucial in a targeted programme, leading to a need to improve the quantity and quality of road safety data - the lack of relevant, accurate, accessible, timely, standardised and integrated data hampers the development, delivery and evaluation of road safety countermeasures.

10. Conclusions

In sports, in economics, in politics it is common practice to analyse, to understand, to find underlying forces, to learn from the past, etc. And to set targets. It seems to be recommended to follow this rational approach in road safety policy as well. This might lead to safety-consciousness and more motivation and dedication of those who are designing and operating our road transport system using scientific knowledge as much as possible. Road safety targets and targeted road safety programmes will be helpful in this approach.

Literature

Allsop, R.E. (1996). *Towards a road safety strategy for the European Union*. Rapporteur's summary of ETSC Symposium 'Strategy for Road Safety', Brussels, 29 March 1996.

Elvik, R. (1993). *Quantified road safety targets: a useful tool for policy making?* In: *Accid. Anal. and Prev.* 25(5), pp. 569-583.

Koornstra, M.J. (1993). *Future developments of motorised traffic and fatalities in Asia*. Paper presented at the Conference on Asian Road Safety 1993 (CARS '93). Kuala Lumpur, October 25-28, 1993.

Ministry of Transport, Public Works and Water Management (1991). *Long term policy for road safety*. Dutch Ministry of Transport, 1991.

Ministry of Transport, Public Works and Water Management (1996). *Meerjarenprogramma Verkeersveiligheid. 'De daad bij het woord' ('Suit the action to the word')*. Dutch Ministry of Transport, 1996 [in Dutch].

OECD (1994). *Targeted road safety programmes*. OECD, Paris.

Read, M. (1995). *Road safety planning and targeting*. PIARC Committee 13 (Road Safety): Report to World Congress Montreal, September 1995.

Rumar, K. & Stenborg, L. (1994). *The Swedish National Road Safety Programme; A new approach to road safety work*. Swedish National Road Safety Administration, 1994.

Wegman, F.C.M. (1995). *Road accident: worldwide a problem that can be tackled successfully! Contribution to the XXth World Road Congress, Montreal, Canada, 4-8 September 1995*. D-95-11. SWOV, Leidschendam.