

A trail to a safer country

Conceptual approaches to road safety policy

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Contents of the project: In all countries of the world people are trying to improve road safety. In road safety literature, however, there are many indications that road safety improvements are moving slowly. Several causes are given for this: firstly, the political priority is relatively low; secondly, it is not well-known how, exactly, road safety should and could be improved. And sometimes there is quite some debate about policy instruments and possible countermeasures. This study focusses on the question whether and how countries can learn from each other how to improve road safety. The question relates to road safety policy in general, as well as the choice of (counter)measures to be taken. This is a study of the PIARC Committee on Road Safety (C13), Working Group 1: Safety Policy. This paper was presented and discussed during the XXIst World Road Congress, October 1999 in Kuala Lumpur.

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1. Introduction

As far as we know, there is not one country in the world where the Government or Parliament has officially announced that road safety is not seen as a social problem. Everywhere in the world people are trying to improve road safety. In road safety literature, however, there are many indications that road safety improvements are moving slowly. Several causes are given for this: firstly, the political priority is relatively low; secondly, it is not well-known how, exactly, road safety should and could be improved. And sometimes there is quite some debate about policy instruments and possible countermeasures.

It is important to realise that road safety problems have proved not to be unsolvable (Wegman et al., 1996). By investing in the quality of the road network system, considerable improvements are possible: *road safety is for sale*. In theory there are many policy instruments available, measures imaginable, and also practically applicable. Nevertheless, one often hears said that not enough is being done to improve road safety. In other words, road accidents cause too many unnecessary casualties. This idea motivates all those for whom improving road safety is their job. This idea nags at those involved in designing the transport system, and especially the road transport system.

In time, many ways are tried to indicate the seriousness of the problem of road safety. To mention a few: a) to compare the road risks with those of other transport systems (road risks are much higher); b) to emphasise their economic consequences (1 to 2% of a country's Gross Domestic Product); c) to position road safety as a public health problem (e.g. the main cause of death among people aged between 15 and 45 and therefore leading to a high number of 'years of life lost' (YLL); d) to announce that, world-wide, 700,000 people are killed every year, according to recent estimations of the World Bank; or e) to state that everyone has a considerable chance of being injured in an accident, some time during their life (in highly-motorised countries, this chance is estimated at more than 50%). However, all this has not resulted in road safety being given a high social and political priority. Although, as already said, no country is satisfied with the present situation, and everywhere in the world road safety policy is being carried out in an attempt to improve road safety.

Road safety measures are quite often controversial: because the positive results are doubted, because reservations are made about the claimed efficiency, because other public goals (e.g. environmental protection) or private interests are involved, and the price for greater safety is too high. Especially in this context the question arises: *what is effective and what does that cost?*

It is understandable that road safety professionals from different countries wish to learn from each other. This is particularly so seeing the fact that road safety is a problem that, to a large extent, is avoidable. On the one hand it is so difficult to attract the necessary attention for it, and on the other hand it is not precisely clear which measures are optimal. The progress made, the effects of specific projects, and the nature of road

safety policy in general are all widely reported in research reports and policy documents, scientific magazines and journals, in international congresses, meetings, working visits, etc. The assumption here is that an effective example from one country, with the necessary local adjustments, can also be effective in another country. In these forms of communication, attention is rarely paid to the specific cultural and institutional context within which measures have been developed and carried out. However, it is this context that determines the generalisation of knowledge, the answering of questions if particular policies have as much chance in a different context as where it was originally carried out.

The central question in this report is whether and how countries can learn from each other how to improve road safety. This question relates to road safety policy in general, as well as the choice of (counter)measures to be taken.

2. Research method

Research into the (potential) safety effects of road safety policy should have a policy theory as basis. A policy model or a conceptual model should be derived from this, leading to an implementation strategy. Such a strategy can be characterised by 'shape, contents, and size'. An example to illustrate this: a Central Government can introduce a subsidy for municipalities that take certain road safety measures, e.g. establishing 30 km/h zones. The type of policy intervention is a subsidy. The conditions of the subsidy come next (e.g. how much subsidy per m², which subsidy percentage, which districts do qualify and which do not). Finally there is the question how large the policy intervention should be (e.g. how many municipalities should be considered, and what is the total sum available, etc.). These characteristics of shape, contents, and size, once they have been established, can be described in evaluation studies, using: a) background characteristics, b) a process description (have many municipalities applied for the subsidy, how many kilometres road have been altered), and c) product measurements (how many less casualties are the result of the 30 km/h zones introduced using subsidy). For this it is necessary that the data be gathered by independent sources, according to a fixed protocol, and be examined per case. Approached in this manner, more cases can be compared with each other, and this will lead to a better insight into forms of effective policy.

The above portrays the ideal situation of the way in which a relationship can be established between policy carried out, and its effects on the development of road safety. However, the actual practice is different. The term 'policy theory' means, according to management experts, that there is a set of assumptions at the basis of tackling a problem; in this case road safety. This is more theoretical than is generally true in real life policy making. It would therefore not seem to be a good starting point for choosing a policy theory linked to a policy and conceptual model. For such a top-down approach there is no generally accepted policy theory. Moreover, the necessary basic data will very probably not exist. It does not therefore make it the most suitable path. Several other possibilities could be explored. Four options are realistic and have been considered in this study.

Option 1

The first approach is to describe the present road safety situation in comparison with the past, and link this to developments in road accident casualties. To do this it is necessary to know: those dates when policy interventions took place, what the interventions meant in terms of measures, which problems were encountered when implementing the measures, and what effect they actually had in terms of road user behaviour. This demands an accurate description in all countries which will be compared. There must also be insight into the possibility of other influences having contributed to any changes. A good example of such a quantitative approach is the study in Victoria, Australia (Cameron, Newstead & Vulcan, 1994).

Option 2

A second approach can be to examine the developments in road accident casualties during a particular period of time. This demands, first of all, a good insight into the data on accident casualties. Then moments can be

specified when policy interventions or other factors could possibly explain changes in the number of road accident casualties. These can then possibly be linked to specific policy interventions or perhaps other (autonomous) developments. If there was such a policy intervention, a deeper analysis of it can be made to see how effective it was.

Option 3

A third type of approach can involve not including the complete area of policy in the comparative study. Such a study can be limited to parts, on the assumption that such parts are a point of interest in many countries. Subjects that readily spring to mind are seatbelt usage (Harvey & Durbin, 1986) driving under influence, and speed-limit policy (e.g. Scandinavian countries, USA). The various countries have different laws concerning these, and undoubtedly approach the matters in a different way. This certainly applies to legislation, enforcement, education, and public information. Deeper comparisons can lead to a better insight into factors for success or failure, and to learn from each other in this way.

Option 4

Another completely different approach is to start with the behaviour of road users and not with road safety policy or the development in the number of road accident casualties. This means that, for the policy parts agreed on, behavioural observations are needed for a period of many years. Changes in behaviour could possibly be linked to policy interventions. Then, depending on the nature of the changes, a relationship with their effectiveness (casualty reduction) can be established.

It can be concluded that all four possibilities mentioned can potentially result in a useful comparison of the successes (and failures) of countries' policies. Each of the approaches however, demands the availability of many different types of information which do not appear to be available in the same way for every country. Comprehensive data has to be gathered, dependent on the chosen explanation model (European Commission, 1999). Such data can be divided into three categories: 1) dependent variables (i.e. accident casualties); 2) independent variables (policy interventions); and 3) data about other relevant influences on road safety development (e.g. economic, social, and environmental indicators). Within the framework of international research methods and data collection, it is to be recommended that agreements are made making it possible that the road safety community increases its knowledge and speed up the learning process (Wegman et al., 1996).

For obvious reasons it was not possible to follow one of the designs described above: the data were almost not existent and certainly not for comparisons between countries. Another approach has therefore been chosen. In the first place, a theory of road safety policy, the choice process concerning policy instruments with the relevant road safety measures, has been developed. The policy theory, here applied to road safety, distinguishes between the various phases of a policy process. The thought here is that each phase of that process must be covered, and that it is unlikely that phases will be missed out. This theoretical approach is dealt with in section 3.1. The same approach applies also to the road safety measures. The thought here is that certain types of measures do and others do not fit a certain level of road safety development (section 3.2). It is here also the

question arises of whether there is a logical succession of measures. If a succession of policy instruments is 'inescapable', certain emphases for measures could not be missed. The question now is, if this theory is feasible, is it consistent with the observed practice in different countries. An attempt has been made to test this in a qualitative way. The results may be regarded as indicative. The results are discussed in Chapter 4.

The design has been chosen so as to invite those countries represented in PIARC C13 Working Group 1 to describe in a short essay, the history of road safety policy in their country. The essence of such an essay means that a personal interpretation can be given of the developments surrounding the implementation of the road safety policy. It is expected that, when writing this essay, attention be paid, in any case, to the following subjects:

- background data, such as: a) the development of the numbers of casualties, b) the risk, and c) an indication of the most important road safety measures, activities, and their effects;
- a description of the history including the road safety situation, the policy followed, the plans and programmes devised;
- a description of the present situation (i.e. halfway through the 90s);
- a view of the future developments;
- a general conclusion.

A questionnaire has been prepared as a guideline for writing this essay. Not every question had to be answered individually. The questions, however, offer support for covering the whole road safety terrain. The questions were grouped around the following subjects:

- organisation of road safety policy;
- plans and programmes;
- budgets;
- accident data;
- most important problems;
- road safety research.

The questionnaire can be found as *Appendix 1* of this report.

Eventually, ten countries provided information: Brazil, Cuba, France, Greece, the Netherlands, Germany, Poland, Sweden, Norway and Slovenia.

The information gathered was analysed. It was then seen if it would fit in the theoretical framework. The information is summarised, per country, in *Appendix 2*.

3. A conceptual approach to road safety policy

3.1. A strategy to improve road safety

The approach of a social problem should normally be done in phases which logically follow each other. Each phase is based on the results of the previous phase. For road safety, also defined as a social problem, one can imagine such a phased approach.

The first phase is one of *signalling and identifying* the problem. The way in which this is done and who does it, can be extremely varied. The initiative can either be political, from social ('non-profit') organisations, journalists or interest groups. But it can also be from individual citizens (scientific or not) who are worried about (in their opinion) undesirable, social developments.

The second phase is characterised by the *demand for social recognition* of the problem. There are not only protests about the worsening of the problem, but also demands for action. Incidentally measures are taken, mostly in a rather isolated manner. Accidents are seen as an individual responsibility of road users and no active role for a government is considered.

The third phase shows the *initial social recognition* of the problem; this phase is the start of public consciousness and awareness. The government takes up a certain responsibility to prevent accidents and develops the initial ideas for (counter)measures. Partly as a result of external pressure, legal measures are prepared. Furthermore, a start is made in developing a vision of future policies.

The *emphasis on the legal instrument* as an important aid to tackling the problem, is the essence of the fourth phase. Not only the government, but also others involved, are convinced that laws are essential to halt and reduce the size of the problem.

The fifth phase begins with the understanding that laws and rules on their own are not sufficient for an effective and long-lasting approach: a *broad preventative approach* is seen as essential. This preventative approach forms part of a formal policy and is aimed at specific parts of the problem.

The sixth phase begins as soon as the approach to the problem, together with the necessary instruments, is deeply anchored in society. This sixth phase is characterised by a *broadening of the initiatives* for an effective approach. More and more organizations who feel involved with the problem are prepared to undertake initiatives. In this phase, more and more attention is paid to the need for insight into the effects of measures, activities, and into questions of optimization.

The seventh phase is one not only of an increasing broadening of initiatives but there is also an *increasing readiness to carry them out*.

The eighth phase is the last one, and is one of complete *anchoring in social activities* of the approach to the problem. One can here speak of it having become 'everyday'. When reaching this phase it is just normal practice when taking decisions, which could influence road safety, to take into account road safety considerations and weigh these seriously.

This conceptual approach or phase approach reflects the way in which protection of the environment had been promoted. It is quite possible that, consciously or not, the social problem of road safety was approached along the same lines. If this is the case, then one or more of these phases should be apparent from descriptions of the policy followed in the various countries. The hypothesis is that the different phases should be examined to see what there is to learn for the next phase. Such a learning process leads, in the long term, to the success of the policy followed.

One must however realise that countries or societies can be very different from each other at a structural and cultural level. Because of this, good ideas cannot just be adopted without thinking; they have to be 'translated' to one's own situation. The abovementioned division in phases should be seen more in conceptual terms.

3.2. **A succession of road safety measures**

Most countries show an increase in mobility, although the time in which this happens may differ. If there was no adequate (road safety) policy, this was accompanied by an increase in road accidents. The development of road safety would therefore appear to be the result of two, apparently autonomous, processes which have a relatively continuous nature. The first process is that of a growth in traffic that tends towards an S-shape curve. This is because the growth is continuous, but the relative growth, in terms of percentage, declines from year to year. The second is the process of a decreasing risk; the number of road deaths per unit of distance travelled declines smoothly. This is in no sense a result of some natural law or a spontaneous development. We might consider this to be a result of a collective effort to adapt a society to growing traffic. Growing traffic requires an enlarged, renewed, improved (and well-maintained) road traffic system. This results in better and newer roads, increasing drivers' experience, newer and safer vehicles and appropriate traffic regulations and enforcement. If the combination of these two processes (mobility growth and risk reduction) then leads to an increase in the number of road casualties, there is every reason to intervene by means of policy and measures.

The concept of the effectiveness of measures is shown in *Figure 1*. The thought here is that every measure has an initiation phase. After this there is an increase or acceleration in its effectiveness, dependent on the size, the scope and the quality of measures. Next, a saturation point is reached; extra efforts lead to a declining positive effect. This is an example of the Law of Diminishing Returns (80-20 rule).

It is without any doubt that an initiation phase for a measure could only start when the society recognises (lack of) road safety as a problem to be tackled. This relates a succession of road safety measures with the conceptual approach as described in section 3.1.

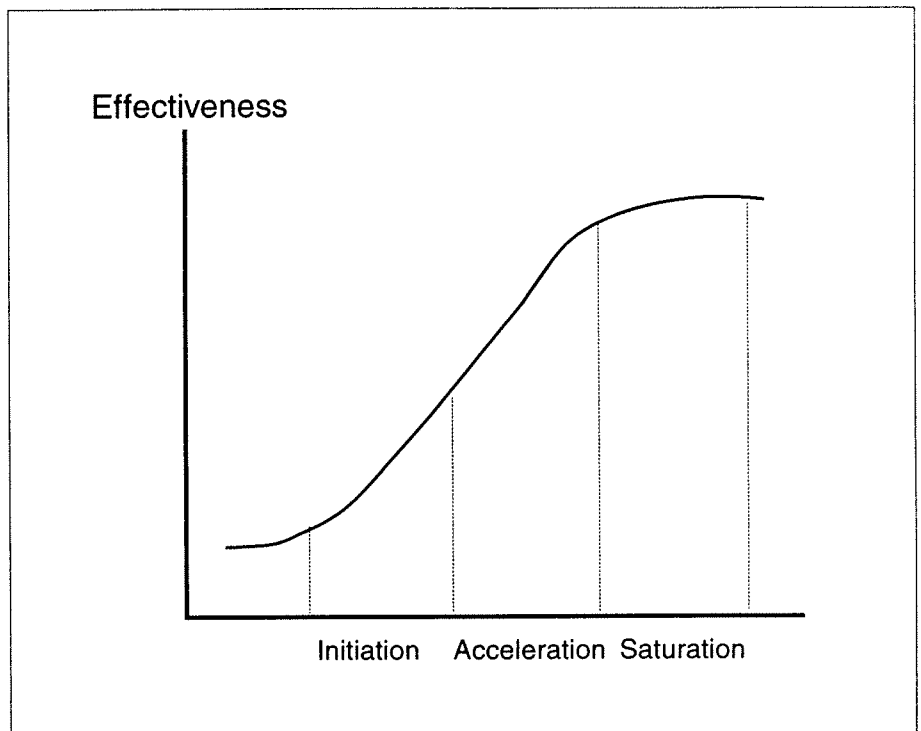


Figure 1. Effectiveness of measures in three phases

Looked at it this way, it would appear, generally speaking, that road safety policy can be characterised as a succession of (generations of) road safety measures (see *Figure 2*) where the start for each road safety measure type is induced by signalling and recognition of the road safety problem combined with the experiences from implementation of road safety measures before.

This leads to the idea of a life-cycle of a policy instrument or measure generating a subsequent policy instrument or measure. This is visualised in *Figure 2*.

The first generation is chiefly concerned with laws and rules and the belief that relatively little supervision of compliance is necessary. Especially in the beginning, this leads to an important contribution to the reduction of the traffic risk. However after some period of time, the risk remains more and more constant, and extra legislation no longer results in a drastic further decline of the risk.

The second generation of measures concerns the adaptation of the infrastructure, especially outside built-up areas. There is a demand for more (physical) space for the increasing traffic (e.g. expanding the motorway network). In this way much more traffic travels on relatively safe or safer roads, partly resulting in a decline in the risk. A lessening of the adaptation tempo, which is happening at the moment in many highly-motorised countries, leads however to a slowing down of the decrease in risk.

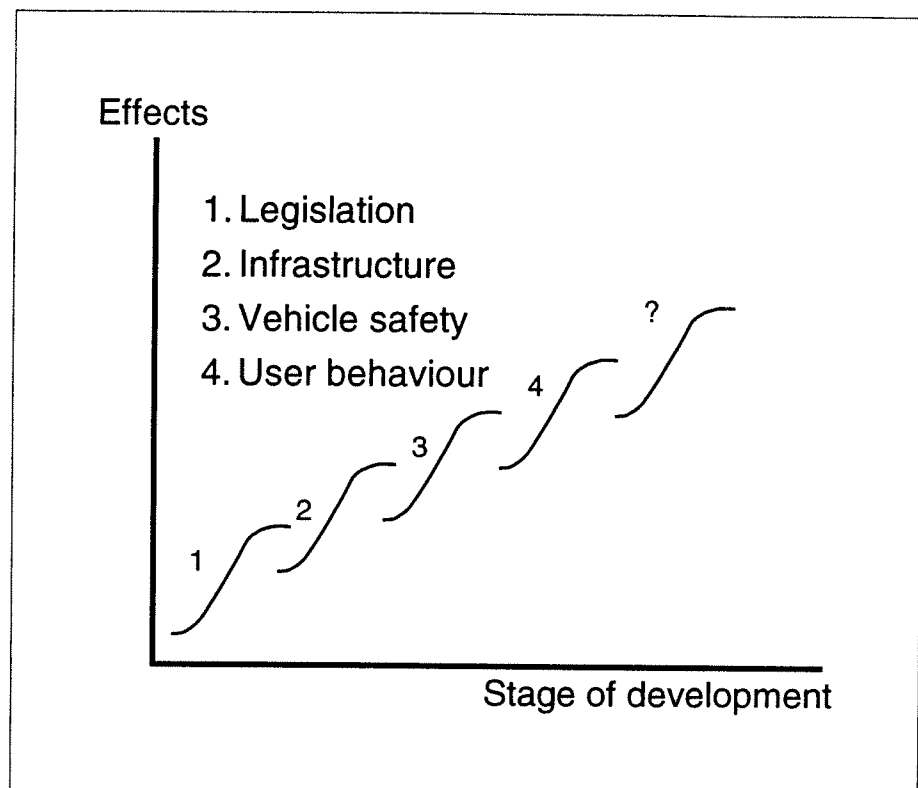


Figure 2. Increase in effects of a succession of road safety measures

The next generation of road safety measures concerns measures that result in increased vehicle safety, especially so-called passive safety. These include the use of crash helmets and seatbelts, but also the improvement (for safety purposes) of car construction. Using such measures, the possibilities of a further reduction in risk does not seem to have been exhausted. This is especially true for the consistent use of protection devices.

The fourth generation of measures is based on influencing road users' behaviour by means of combinations of laws, information, education, enforcement, and changes in the infrastructure. Their greatest exponents are alcohol limits, speed limits, and infrastructural adaptations in residential areas that should lead to lower speeds.

Fifth and further generations of measures can not yet be clearly distinguished, but they will almost certainly announce themselves. It seems anyway to be the case that, when the contribution of a generation of measures towards the decrease in traffic risk is beginning to run out, a subsequent generation is brought to life.

As far as further generations of road safety measures are concerned, there are two notions.

The first notion is that there is a considerable number of policy interventions and measures known, but that the maximum profit has not yet been achieved in many countries. This requires more attention to a higher quality implementation of known policy interventions and measures. This, in turn, leads to more attention to implementation problems in practice and to the possibilities or impossibilities of the execution of measures by different stakeholders (local governments, police, private organisations). It almost seems as if this understanding of problems related to a sound implementation of measures leads to a greater contribution of other bodies than the central government. This is probably the result of an increasing consciousness that road safety is still a problem (even in the safest countries in the world) and that this problem could not simply be solved by just inventing and implementing new road safety measures. More and better implementation of existing measures could be considered as the fifth generation of measures.

The second notion is the question of whether or not adaptations of the present road transport system will lead to much safer road traffic in the longer term. Even the fifth generation of measures has its limitations and the question could be posed: could 'more and better implementation' result in a considerably (ten times?) safer road traffic system? This notion has led to developments of new concepts: in Sweden 'Zero-vision' (SNRA, 1996) and in the Netherlands 'Sustainable Safety' (Wegman & Elsenaar, 1997). These concepts answer this question negatively. These new concepts could be regarded as a sixth generation of road safety measures.

The schematic presentation of road safety policy as a succession of generations of measures does not, by any means, cover all countries or types of measures. Measures, as a result of different, specific circumstances, can certainly differ by country. It does, however, seem to be true that the principle of successive phases does indeed apply. The past, therefore, could be our guide: a trail to a safer country.

4. Concluding remarks

From the essays studied, it can not be directly derived how, and to what extent, the countries have learned when formulating road safety policies, designing packages of measures and implementing them in the form of countermeasures. Certain indications have, however, been found from which can be deduced that countries learn from each other. Furthermore, policy processes and choices of measures fit, in the main, in the theoretical policy model with the consecutive generations of measures as described in Chapter 3.

In all countries, a phase of problem signalling is evident. However, this is not always followed by the second phase of problem recognition. This is evident from the explicitly formulated road safety policies. As would appear from the essays, this is mainly a result of the fact that in those countries there are other, more important problems; which is why there are none or limited financial resources available for road safety. There appears to be an interaction between political decisions, policy making and public opinion. Society has priorities above road safety problems, and politics is inclined to concentrate on these priorities.

In the countries where road safety has indeed been signalled and recognised as a problem, it is apparent that this idea was born roughly in the same period as that in which the number of accidents increased. This study provides no examples of countries in which the growth of mobility was accompanied by such timely and great investments in road transport system improvements that an increase in the number of accidents was prevented. It is clear that an increase in the number of accidents (evident from the extremely high economic costs and human suffering) is a prerequisite for problem recognition. An expected increase is not. It was not reported that countries did not know which measures to take. This might be explained by the fact that a considerable amount of information on safety effects is available because it is reported in the international literature (e.g. Accident Analysis and Prevention), in state-of-the-art reviews (e.g. OECD) and at international conferences (Rumar, 1999).

Growth in mobility and the accompanying increase in the number of accidents and casualties lead in almost all countries to the same approach. First of all, changes in the law, their enforcement, and, if their effect was less than expected, an intensification of law and enforcement. At the same time, in all countries, attention was paid to institutional questions, viz. how to organise road safety policy. This is an issue that is of importance in many countries up to today. Also attempts to broaden preventative road safety policies could be traced in all countries.

The hypothesis that the strategies to improve road safety go according to the already mentioned policy model, would seem, until now, to be confirmed. It is, however, still not clear if countries have learned from each other. The essays do not deliver hard evidence but the information certainly suggests the plausibility of this learning process. The phases of problem signalling and recognition happened in the most highly-motorised countries around the same time. At this point one becomes internationally

interested and orientates around those problems relevant to road safety. It may be assumed that countries have learned so much from each other during this period that they have copied measures from other countries. A few examples: drinking and driving policies (random breath testing, ICADTS-conferences), passive safety (seat belts, ESV-conferences), traffic calming, design of motorways (PIARC, IRF conferences). A glance at the *Appendix 2* shows this 'copying process', to a large extent, to be the case. Similar types of measures follow each other in rapid succession, or are considered.

A stagnation in the decrease of casualty risk is in turn the reason to consider new initiatives or even a new approach. Some countries choose to fall back on well-known measures and on an intensification of already existing, well-known measures. Others seem to be focussing on the possibilities that modern electronics could offer. Some others try a different approach and aim for a traffic and transport system that is called inherently safe. No results in terms of accident reductions were reported yet for these last two.

These last developments, which can all be considered as belonging to the later phases of the policy model, seem to have been reserved for only those countries who have had a strong economic growth and mobility growth since the Second World War. This does make sense because an effective road safety policy is expensive and becomes even more expensive when simple road safety measures have been exploited fully. This fact, together with the fact that growth in public consciousness is also relevant, explains that in some countries road safety has not got such a high priority as in other countries. In highly-motorised and highly-developed countries increased attention is paid to a population's general well-being; thus to accidents and their prevention. This probably explains why relatively few countries give road safety a high priority.

The policy model, as described earlier, would seem to be applicable to most countries irrespective of their phase in mobility development. Unfortunately, only an increase of the number of casualties seems to initiate the development of road safety strategies and remedial measures.

What can we learn from the experiences which we have had until now? The first lesson is that we should be socially conscious so that we signal and recognise road safety as a problem. Fundamentally, this is a *reactive approach*: first road accidents, then measures to prevent them. It seems to be the case that this is an inevitable route! Of course, how to raise awareness will vary per country because institutional and cultural differences have to be taken into account. It is not clear from the essays how this is realised in the different countries, but it is crystal clear that this is an area which is not very well documented. The second item deals with the question how to improve road safety (which measures to be taken?) and what could countries learn from each other in this respect. Initially, the answer is found in laws. Then follows the well-known range of measures: driving licence, vehicle tests, alcohol limits, seatbelts, and speed limits. Here we have to understand that 'only laws' do not change human behaviour; laws are only one link in a chain (information and enforcement). Furthermore, we have to understand that some measures are potentially good, but not implemented well enough or are not maintained, leading to lower effects than expected.

This then leads to increasing attention to the quality and the scale of implementation. Over the years the number of effective measures has increased, our knowledge has increased and these measures could be copied (in modified form) in other countries. It is without saying that just copying of 'good examples' is a poor response if measures are not related to well-analysed problems and are not adapted to local conditions.

An important question here is how much more safety can be built into the road transport system if components of this system are moistened, renewed and expanded (*a pro-active approach*). On the one hand this requires enough knowledge, in which international exchange plays an important part. On the other hand there is the matter of establishing political priorities in decision making. This sometimes leads to an intensification of the existing measures, sometimes to developing a new policy vision, and sometimes to a combination of both.

Considered this way, the learning process is the sum of a logical, step-by-step sequence of learning events, in which it would not be logical if the next step was not dependent on the previous step. There first has to be a step/phase of problem recognition. If then a strategy and policy are formulated, the next step is attempting to optimise them. This means that one must monitor and evaluate which effects implemented policies have (input, throughput and output). This process could be even stronger if quantitative targets are used. OECD (1994) has in its report 'Targeted Road Safety Programmes' given an overview of the effects of setting quantitative targets in road safety and practices in different Member States. The report shows convincingly that these targets result in more realistic traffic safety programmes, better use of (scarce) public funds and other resources, and improved credibility of those involved in the traffic safety work.

This approach requires using so-called *performance indicators* to make strategies, policies and countermeasures transparent, leading to valid conclusions about successes and failures. This of course is a far wider issue than road safety. A conceptual model for performance indicators was developed (OECD, 1997) and is being tested in field trials in 15 OECD countries. A short introduction of these performance indicators can be found in *Appendix 3*.

5. Recommendations

It is not very clear which mechanisms are active in the phases of problem signalling and recognition, and how to improve or stimulate public consciousness and awareness. It is recommended that further research be undertaken in this field. Furthermore, it seems to be useful to develop tools which allow road safety considerations to be taken seriously when changing components of the road transport system. This recommendation is based on the assumption that road safety is not only a separate sector, but is a facet of other policy fields. For example, this relates to town and country planning and the planning of infrastructure, but can also be relevant to other sectors such as public health. The development of a zero-vision and sustainable safety reflects this clearly.

It is furthermore recommended to study how transitions could be accelerated between the different phases of the conceptual approach as described in section 3.1. A second follow-up from this study is to define which road safety measures fit in the different phases of the conceptual approach.

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Appendix 1

Questionnaire on road safety policy

A. Organisation of traffic safety policy

1. Who is responsible for road safety policy in general?
2. Who is responsible for the aspects of traffic safety like education, enforcement, engineering?
3. Are there special governmental commissions with regard to (aspects of) traffic or traffic safety?
4. If yes, which bodies or institutions take part in those commissions?
5. Is road safety work co-ordinated e.g. between ministries (how, since when, results)?
6. Are there legal regulations for co-ordination?

B. Laws and regulations

7. How do politicians get information about the situation regarding traffic safety?
8. Is road safety one of the topics of governmental policy (since)?
9. Is there a specific governmental plan on traffic safety policy?
10. Are there specific local plans on traffic safety policy?
11. Are local plans adjusted to governmental plans?
12. Do you have a road safety programme (since when)?
13. Which are the main objectives?
14. Did you set quantitative goals (which, since when, results)?
15. Do you have laws with special regulations for road safety regarding the construction of roads?
16. Do you have road safety impact assessment?
17. Do you have safety audits?

C. Budget

18. Do you have a special budget for traffic safety?
19. Does the number of traffic accident influence the decisions for investments in the construction of roads?
20. Do you have special programmes for traffic calming in urban roads by reconstructing or low cost measures?
21. Are those programmes State-aided?
22. Do you have means for road safety campaigns, workshops, audits?
23. Do you promote private activities?

D. Accident data

24. Who collects accident data?
25. How are data published?

E. Main problems

26. Which are the main problems regarding to traffic safety?
 - black spots;
 - DWI;
 - speeding;
 - driving through red;
 - accidents with bicyclists;
 - accidents with pedestrians;
 - accidents younger people;
 - accidents with elderly people;
 - other.
27. Which is the kind of measures taken (rules, enforcement, information, education)?
28. Did measures have effect (how measured)?
29. Which criteria are handled to test the effect of measures?
30. Is there any independent evaluation of implemented road safety policy?

F. Private activities

31. Are there any private activities regarding road safety?
32. Do they have political influence?
33. Do private organisations get financial support?
34. Is there private road safety research in your country?

Appendix 2 Summary of the questionnaire outcome

Country	1*	2*	3*	4*	5*	6*	7*
Norway	1970	Early 70s	No	Design guides black spot impr. alcohol legislation seat belts speed enforcement information education	New urban roads intensifying measures roundabouts ASC speed limits humps safety handbook	Decentralisation to counties same measures but more effective attention for special groups traffic safety packages safety related to environment	Increasing mobility declining consciousness
<p>Conclusion in Norway: We have been able to reduce road accidents so far, but have not been able to eliminate the problem. This calls for a new and more effective approach. We will have to make do with less money and use it better. Concentrate on what we know and work more closely with all parties interested in road safety. It is vital to decentralise road safety work and help counties and communities in their efforts. Develop strategies that can improve road safety and the environment as well. Revitalise the traffic safety initiative we had in the 1970s and early 80s.</p>							
France	1972	No	Yes	Speed limits seat belts alcohol legislation helmets	Decentralisation incentive programmes minus 10% additional funding new alcohol law specific speed limits	Mandatory check of cars new licensing system safety education in schools point demerit system	Quantitative target
<p>Conclusion in France: Managing road safety policies has not been easy in the past, due at first to the national government and local authorities having other priorities, then to resistance in the public. Incentive programmes have had a demonstration effect thus facilitating the expression of a demand for road safety and generating further action at the local level. There are two drawbacks in the policies set up since 1982. First, involving more people in road safety work at the Department level has meant a decrease of the proportion of actual professionals in the decision-making and planning processes. Second, the super-imposition of deconcentrated road safety policies and locally initiated ones has sometimes created complex decision-making and action processes in departments or cities and some local actors find it difficult to sort out the different tasks or responsibilities.</p>							
Western Germany	1970	Yes	No	Obstacle free zones safer road design guidelines constr. speed limits alcohol legislation seat belts point system helmets first aid package	Vulnerable road users second programme 2 step driving licence		
Eastern Germany	1977	No	No	Statutory seminars for drivers	Guidelines for road building enforcement		
Germany						30 km/h zones enforcement child restraints increase penalties for speeding vulnerable road users	'Bicycle amendment' to improve cycling 'cycle streets'
<p>Conclusion in Western Germany: After a steadily increase of fatalities in traffic - following the increase in motorisation - a broad preventative approach brought a steep decrease in fatalities since 1970. Parents initiatives and private organisations had influence on the local, regional and national political levels. The good experiences with traffic calming in the Netherlands has had a great influence on road safety politics and measures for urban areas in Western Germany.</p> <p>Conclusion in Eastern Germany: Up to the reunification in 1990 road safety policy in the former DDR emphasised on legal instruments combined with a consequent enforcement. Preventative measures were concentrated on education. The safety standards of cars and roads were low. Unification brought the breakdown of enforcement combined with the steep increase of private cars resulted in a dramatic increase of the number of fatalities. In the following years the safety standards of cars and (the most important) roads increased considerably and the road safety effects are positive. But still, the number of fatalities are considered as far too high: 17 fatalities per year per 100.000 inhabitants. Even nine years later the social recognition of this safety problem is low and only scarcely private initiatives are taken for a preventative approach.</p>							
Slovenia	1973	No	No	Construction of motorways	Construction of motorways	Construction of motorways analysis of accidents	Preparation of a plan new legislation constru- tion of motorways
<p>Conclusion in Slovenia: The road safety issue is nowadays slowly emerging in the Parliament and in the mass media as a national problem. It is expected that in the future the political climate will grow to establish an overall National Road Safety Programme that will set up and put into operation an integral system of activities which will result in achieving short and long term safety objectives.</p>							

Country	1*	2*	3*	4*	5*	6*	7*
Poland	1997	No	No	-	-	Road Safety Council, start of Gambit	Preparing a national plan
<p>Conclusion in Poland: In Poland there are no mechanisms at present which could help carry out an effective policy to reduce the growing jeopardy in road traffic safety. It is necessary to recognise road traffic safety as being the top social problem for society, politicians and decision makers. Furthermore it is necessary to agree and accept implementation of the National Programme of Road Traffic Safety Improvement. For realisation of the above, promotion of road safety problems in mass media together with allocation of adequate funds are indispensable.</p>							
Brazil	1996	Yes	Yes	-	-	-	-
<p>Conclusion in Brazil: despite the creation of a national integrated program, one can hardly say that there is one group responsible for traffic safety in general, placed for instance in the Ministry of Transport, under which leadership and coordination the program is implemented. Inappropriate institutional arrangements are aggravated by the lack of political willingness and, as a consequence, by the fact that politicians do not play a special role in the organisation of traffic safety policy..</p>							
Sweden	1967	1994	Yes	Speed limits enforcement seat belts helmets annual veh. inspec. DRL	Setting goal	Centralise responsibility programme, new goals, road safety performance indicators, result management	The zero vision, consumer information, private sector
<p>Conclusion in Sweden: The fact that the main organisations are now co-operating very well on all levels in society, together with the fact that politicians have accepted and support both the road safety vision and the road safety programme, have made the climate for road safety work in Sweden very favourable at the moment, regardless of the high level of road safety in respect to other countries.</p>							
Netherlands	1972	Yes	Yes	Legal force road building helmets alcohol legislation seat belts woonerfs	Vulnerable road users more enforcement	Decentralisation action minus 25% Regional Committees the idea of sustainable safety	Concept of sustainable safety became a pillar of road safety policy
<p>Conclusion in the Netherlands: there is a great deal of social and political attention paid to the improvement and extension of the physical transport infrastructure seen from the problems of congestion and accessibility. Road safety is trying to take advantage of this development by ensuring that the road safety effects are automatically taken into account whenever important decisions have to be taken. The concept of sustainable safety became a pillar of road safety policy and gave a fresh impulse. For a number of traditional road safety subjects like drink-driving, speeds and seat belts a new profile is looked for in combination with renewed and greater commitment of police and courts. Government budgets available for improving road safety do not seem to be sufficient.</p>							
Cuba	1993	No general plans	No	Speed limits, enforcement, vehicle inspection, black spot impr., road constructions	Education and information, black spot improvements, road constructions	Road constructions, bicycle facilities, traffic management systems	Road safety audits, evaluation of black spots and black sections
<p>Conclusions in Cuba: although some concern is expressed in Cuba about the increase of the number of casualties no massive efforts are taken to improve road safety.</p>							
Greece	1982	Only short term plans	No	1985	Speed limits, black spot improvements, mass media campaigns	First Road Safety Congress, White Book on road safety, construction of motorways, Traffic Code	Road safety policy adopted by Greek Parliament, Second Road Safety Congress, construction of motorways, new Traffic Code

* Column titles:

1. Highest rate of casualties
2. Plan
3. Goal(s)
4. First measures
5. Measures during the 80s
6. Mid 90 measures
7. Late 90s development

Appendix 3 Performance indicators for road safety

It should be clear that an international comparison of road safety policies, policy interventions, and measures is not possible because the necessary data does not exist. This is partly a result of the fact that it is more the exception than the rule that a country gathers such data systematically. There are also absolutely no international agreements on this subject, which makes it difficult to learn from each other. This study also shows once more that such agreements are extremely desirable. In making this recommendation we support a recent OECD study on this subject (OECD, 1997). The OECD report advocates the use of so-called Performance Indicators (PI) for the whole road transport system. By means of this it is possible to measure whether policy goals/targets have been reached, and which means contributed to this. This approach can gain more shape the more explicitly the policy goals are formulated. For example, in terms of quantitative goals, such as a reduction in the number of casualties of 35% in 10 years time.

Based on a policy theory, an explanatory (mathematical) model should be formulated for policy, and this in turn be translated into indicators. First of all it is necessary to define product or output indicators (e.g. the number of accident casualties); with or without reference to policy considerations (e.g. the number of accident casualties among children going to school). The policy to be carried out, or already carried out, should then be operationalised in terms of indicators (e.g. the number of random breath tests carried out). Then it should be measured as to which behavioural changes this has led (e.g. the number of those driving while intoxicated). Finally, it should be examined if these behavioural changes can also be found in the defined output indicators (e.g. the number of accident casualties). In order to make such a judgement, other possible factors of influence (e.g. the weather) should be measured and used in the analysis. Such an approach requires that an explanatory model be designed specifically for road safety. Designing such a model can rely on the recent developments whose uses can be extended in the direction of the above.

It is desirable that, within the framework of international bodies (the European Union, OECD, PIARC, etc.), agreements should be made about a uniform way of data collection, data analysis, and monitoring and evaluating measures. This should preferably fit into a generally accepted policy model. We suggest that the data thus gathered be stored in a database that is user-friendly. Such a database would then not only be available to learn from each other regarding road safety policy in general, but also for policy interventions and road safety measures.