

# **Sharing responsibility - central and local government partnership**

Fred Wegman

D-2001-7



## **Sharing responsibility - central and local government partnership**

Contribution to the Road Safety Conference of the European Transport Safety Council, 12 September 2000, Brussels

D-2001-7  
Fred Wegman  
Leidschendam, 2001  
SWOV Institute for Road Safety Research, The Netherlands

## Report documentation

Number: D-2001-7  
Title: Sharing responsibility - central and local government partnership  
Subtitle: Contribution to the Road Safety Conference of the European Transport Safety Council, 12 September 2000, Brussels  
Author(s): Fred Wegman  
Project number SWOV: 30.903

Keywords: Responsibility, government (national), local authority, partnership, safety, policy, Netherlands.

Contents of the project: During the last decennia, a great deal of knowledge has been developed about the effectiveness of certain measures in improving road safety. However, there is a lot less knowledge about the implementation of measures.  
In this report, the introduction of the 'sustainably-safe' approach in the Netherlands is described. It illustrates the proposition that the cooperation between various government departments during the implementation of measures determines the success of policy.

Number of pages: 21 pp.  
Price: Dfl. 17,50  
Published by: SWOV, Leidschendam, 2001

SWOV Institute for Road Safety Research  
P.O. Box 1090  
2260 BB Leidschendam  
The Netherlands  
Telephone 31703209323  
Telefax 31703201261

## Abstract

During the last decennia, a great deal of knowledge has been developed about the effectiveness of certain measures in improving road safety. However, there is a lot less knowledge about the implementation of measures. It is exactly this implementation that eventually leads to potentially effective measures actually resulting in less traffic victims. It is the cooperation between various government departments during the implementation of measures that determines the success of policy. This proposition can be illustrated by the introduction of the 'sustainably-safe' approach in the Netherlands.

Sustainably-safe takes the point of view that the current road transport is intrinsically unsafe, and that a better implementation of existing policy will not result in a drastic reduction of the number of traffic victims. Sustainably-safe is based on the notion that mankind should be the measure of all things, and that the road user should be provided with such a traffic environment that the chance of making mistakes (with the resulting serious accidents) is reduced considerably.

This sustainably-safe approach has been introduced in the Netherlands, and is now an official element of Dutch road safety policy. The introduction process was carried out with a great deal of care and intensity, in order to obtain the cooperation of all parties that bare a responsibility for road safety. The ambition was, and still is, to involve all parties in the implementation of the sustainably-safe approach. This ambition makes great demands of the introduction process.



# Contents

|      |  |    |
|------|--|----|
| 1.   | <b>History of road safety</b>  | 7  |
| 2.   | <b>Towards a safer country</b>   | 9  |
| 2.1. | Quantitative targets   | 9  |
| 2.2. | A trail to a safer country   | 10 |
| 3.   | <b>Road safety policy in the Netherlands</b>                           | 12 |
| 3.1. | Priorities in the 1980's and the 1990's                                | 12 |
| 3.2. | Developments in the 1990's   | 12 |
| 3.3. | Two policy approaches  | 13 |
| 4.   | <b>Sustainable safety - a new road safety vision</b>                   | 14 |
| 4.1. | Concept of sustainable safety  | 14 |
| 4.2. | Application of three safety principles                                 | 14 |
| 4.3. | Characteristics of a sustainably safe traffic system                   | 15 |
| 5.   | <b>From concept to successful implementation of sustainable safety</b> | 16 |
| 5.1. | Start-up Programme Sustainable Safety - 'Go to the start'              | 17 |
| 5.2. | Demonstration projects   | 18 |
| 5.3. | Supporting measures  | 19 |
| 5.4. | Financing sustainable safety   | 20 |





## 1. History of road safety

As far as we know, the very first road death in the Netherlands was on the 24th of September 1901. However, it was not until 1926 that road deaths were registered. In that year, they appeared as such in the Statistics of the Causes of Death. The Road Safety Statistics did not start as a separate registration until 1934. The Netherlands uses the definitions for road deaths according to the 1968 Convention of Vienna. These include the so-called 30-day period: road victims that die as a result of a road accident, within 30 days after the accident occurred, are called road deaths. Up till the year 2000, we estimate that approximately 110,000 people have been killed in road accidents.

*Figure 1* shows the number of road deaths in the Netherlands since 1950. This is about 10 years before the mass motorisation process started in the 1960's. The number of deaths were about 1000 in 1950, 2000 in 1960, and 3000 in 1970. The peak was reached in 1972, with 3264 deaths. Since then, the number dropped to about 2000 in 1980, and (slightly more than) 1000 in the year 2000.

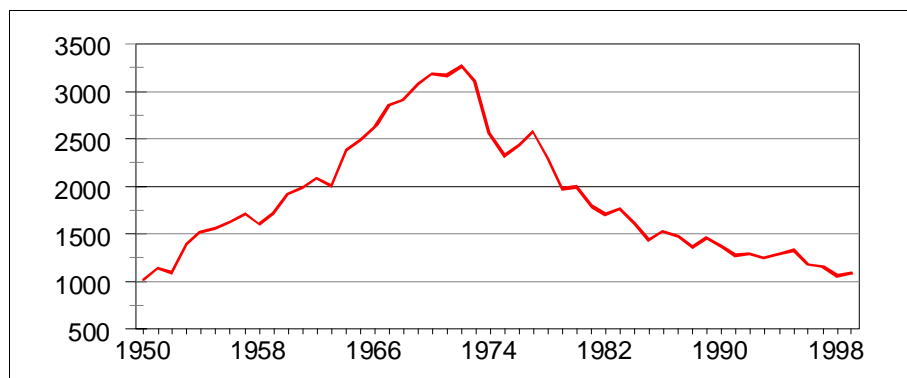


Figure 1. *Number of road fatalities in the Netherlands since 1950.*

During the years, there have been many ways of looking at the causes of accidents. *Table 1* shows, in a few words, how they were regarded in the world. This overview is inspired by an OECD study on road safety theories and models.

|           |   |
|-----------|---|
| Period    | View on the main cause of accidents   |
| 1900-1920 | Accidents are a chance phenomenon (they are BAD LUCK!)  |
| 1920-1950 | Accidents are caused by dangerous drivers (accident proneness)  |
| 1940-1960 | Accidents have one dominant cause   |
| 1950-1980 | Accidents have a combination of causes (the SYSTEM APPROACH)  |
| 1980-2000 | The human being is the weak link: influence more his behaviour  |
| 2000      | <ul style="list-style-type: none"> <li>- Better and more cost-effective implementation of existing policy.</li> <li>- Dutch SUSTAINABLE SAFETY: adaptation of the system to suit human limitations</li> </ul> |

Table 1. *The several ways of looking at the causes of accidents in the 20th century.*

During the period of the system approach (1950-1980), a matrix was presented by William Haddon in 1972, in which he introduced a logical framework for road safety. An example is given in *Table 2*.

| Phase      | Main components of road traffic |                      |                 |
|------------|---------------------------------|----------------------|-----------------|
|            | Human                           | Vehicle              | Road            |
| Pre-crash  | Alcohol intoxication            | No profile on tyres  | Street lighting |
| Crash      | Wearing seatbelts               | Collision resistance | Barrier rail    |
| Post-crash | Guarding accident location      | Fire resistance      | Telephone posts |

Table 2. *An example of applying the so-called Haddon-matrix.*

In 1985, a Swedish study indicated that the human factor was at least partly responsible in 95% of all accidents, the road and its surroundings for 30%, and the vehicle for less than 10%.

## 2. Towards a safer country

The Netherlands had the 3rd lowest mortality (road deaths per million inhabitants) of the 15 countries of the European Union in 1997 (see *Figure 2*). Only Sweden and the United Kingdom had a lower mortality; all three are so-called highly developed countries. This has been the situation for at least the last 10 years. By far the highest mortalities are those for Greece and Portugal. These are two of the least-developed of the EU member states.

The mortality for the Netherlands is approximately half of the EU average.

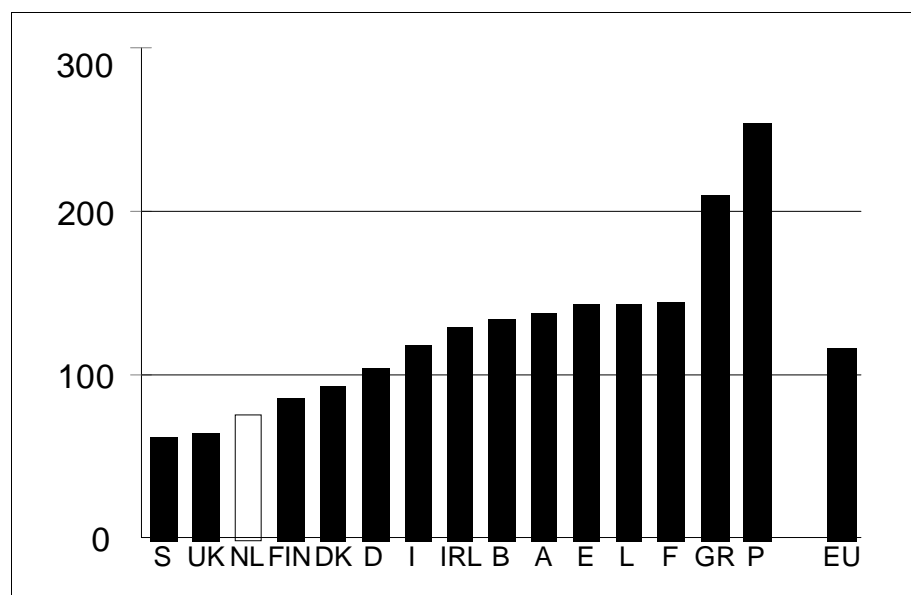


Figure 2. Number of road victims killed per 1,000,000 inhabitants in the countries of the European Union in 1997.

### 2.1. Quantitative targets

The Netherlands was the first country of the European Union to establish quantitative targets for road safety; Japan had done this a few years earlier. These targets were set for both the registered number of deaths and for in-patients. The base year was 1985, and the targets were 25% reductions by the year 2000, and 50% (for deaths) and 40% (for in-patients) by the year 2010.

*Figure 3* shows that, as far as deaths are concerned, the target will be achieved when the efforts to improve road safety further will be continued.

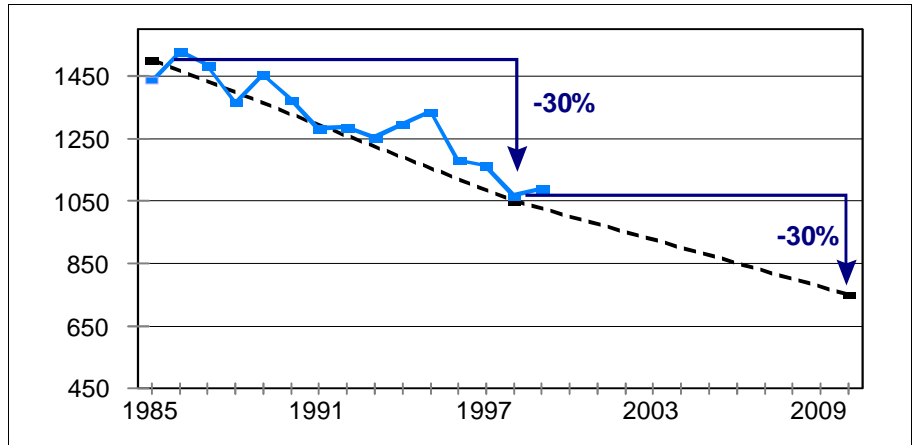


Figure 3. Quantitative targets for road fatalities (dashed line) and the actual fatalities (solid line) in the Netherlands since 1985.

## 2.2. A trail to a safer country

A policy instrument or measure often generates a subsequent policy instrument or measure. The total 'life-cycle' leads to an overall effect. For road safety policy, a life-cycle of at least four generations can be distinguished (see Figure 4).

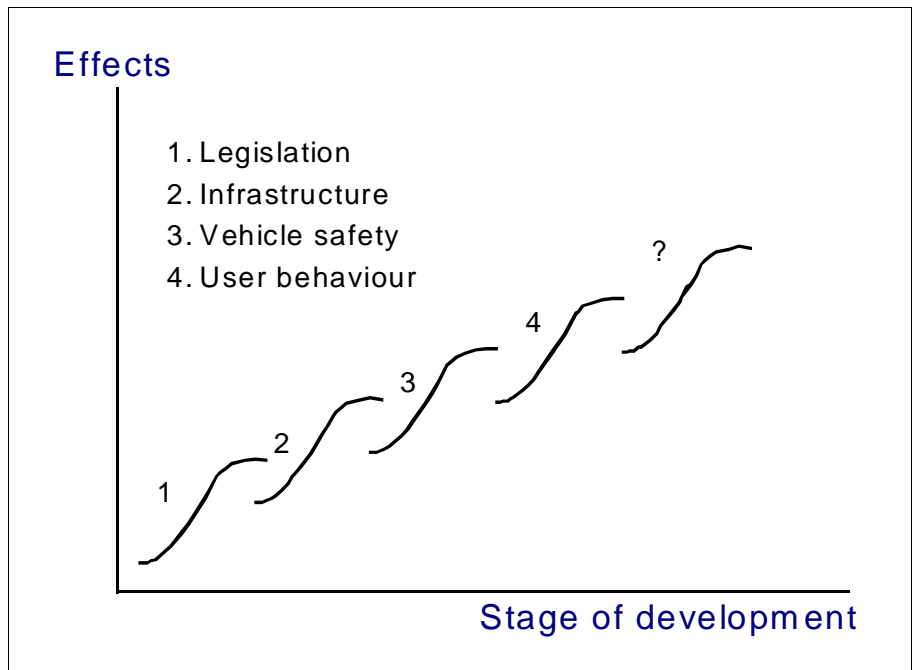


Figure 4. Four 'generations' in the 'life-cycle' of road safety policy.

The first generation is chiefly concerned with laws and rules and the belief that relatively little supervision of compliance is necessary. The second generation concerns the adaptation of the infrastructure, especially outside built-up areas.

The third generation concerns measures that result in increased vehicle safety, especially so-called passive safety, such as crash helmets and seatbelts.

The fourth generation is based on influencing road users' behaviour by means of combinations of laws, information, education, enforcement, and changes in the infrastructure.

Fifth and further generations of measures can not yet be clearly distinguished, but they will almost certainly announce themselves.

### 3. Road safety policy in the Netherlands

#### 3.1. Priorities in the 1980's and the 1990's

The priorities in the Dutch road safety policy of the 1980's and the 1990's were the following:

- Drinking and driving;
- Speed;
- Hazardous locations;
- Children and the elderly;
- Safety devices.

This list is taken from the Dutch Long-term Road Safety Programme in which the priorities are called 'spearheads'. The complete list of spearheads (written in the words of the English translation of the Dutch report) is: alcohol, safety devices as seatbelts and helmets, speeding, hazardous situations, older and younger road users, and heavy traffic.

The list of spearheads was chosen by using the official/police road accident registration data, knowing it to be incomplete (even for in-patients) and selective (for example, cyclists and pedestrians are much more incomplete than car and lorry occupants). The data was used because the alternatives, such as hospital data and two 12-month long surveys, had other defects. The choice of spearheads was based on a combination of a) a large absolute number and/or b) a high risk (victims per kilometre travelled) and/or c) a large absolute number as crash opponent and/or (the expectation of) a considerable increase in the future of a), b), and c).

#### 3.2. Developments in the 1990's

Recently, the Dutch Ministry of Transport conducted a survey amongst 'key stakeholders', such as regional and local authorities, the police, road safety organisations, etc. In this survey, a picture was given how the implementation of policy can be improved and how the partners can contribute to this. The following picture was given:

- The increasing mobility demands additional efforts to achieve road safety targets.
- Concern exists about deteriorating road user behaviour and reduced levels of traffic law enforcement.
- Implementation of sustainably safe road transport asks for more financial means, a better understanding of the concept, and more integration with environmental planning and general safety policy.
- Decentralisation of road safety policies needs to further crystallise and the parties still have to become accustomed to their new role.
- Development and dissemination of relevant information on road safety policies need to be improved.

### 3.3. Two policy approaches

From then on, two approaches could possibly be followed:

1. To implement the existing policies and programmes in a better (scale, quality) and more cost-effective way.
2. To tackle the roots of an intrinsically unsafe road traffic system.

#### *Ad 1.*

There is a considerable number of policy interventions and measures known, but the maximum profit has not yet been achieved in many countries. This requires more attention to a higher quality of the 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).

#### *Ad 2.*

The question is 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 (see section 2.2 '*A trail to a safer country*') has its limitations and the question could be posed: could 'more and better implementation' result in a considerably (10 times?) safer road system? The results of the policies and programmes of the early 1990's and their potentials answered this question negatively. New, innovative concepts were required, which could be regarded as a sixth generation of road safety measures.

## 4. Sustainable safety - a new road safety vision

New, innovative road safety policy was required, and in 1990 SWOV was invited by the Dutch Government to develop a scientifically supported, long-term concept of a considerably safer road traffic system.

The general concept of sustainable development was introduced by the UN Brundtland Commission (see *Figure 5*). This concept also inspired the new vision for road safety: no longer do we want to hand over a road system to the next generation in which we have to accept that road transport inevitably causes thousands of deaths and tens of thousands of injured victims; year after year in the Netherlands.

“We do not wish to hand over the next generation a road traffic system in which - inevitably - a road accident toll as today’s has to be expected.”

Figure 5. ‘Sustainable development’ of the UN Brundtland Commission, adapted to road traffic.

### 4.1. Concept of sustainable safety

The aim and strategy of the concept of ‘sustainable safety’ are:

- to drastically reduce the probability of accidents in advance, by means of infrastructure design, and
- to virtually exclude serious injury in the accidents that still occur, by influencing the process which determines the severity of the accidents.

The concept is based on the principle that man is the reference standard, or ‘the measure of all things’. A sustainably safe traffic system therefore has an infrastructure that is adapted to the limitations of human capacity.

A sustainably safe traffic system has:

- proper road design adapted to limitations of human capacity,
- vehicles fitted with ways to simplify the tasks of man and constructed to protect the vulnerable human beings as efficiently as possible, and
- road users who are adequately educated, informed and, where necessary, controlled.

### 4.2. Application of three safety principles

The key to arrive at a sustainably safe road system lies in the systematic and consistent application of three safety principles:

1. **Functionality:** functional classification of the road network to prevent unintended use of roads;
2. **Homogeneity:** prevent large differences in vehicle speed, mass, and direction;
3. **Predictability:** prevent uncertainties amongst road users, by enhancing the predictability of the road’s course and the behaviour of other road users.



#### 4.3. **Characteristics of a sustainably safe traffic system**

The concept and the three safety principles of sustainable safety result in the following characteristics of a sustainably safe road system. The *road user* represents the central element, the reference.

With respect to *vehicles*, the diversity should be kept to a minimum. Furthermore, the various types should be clearly distinguished. When used in the same traffic area, vehicles should demonstrate the same behaviour as far as possible, or otherwise be provided with separate facilities.

*Roads and streets* are built with one major function. Three options should be distinguished:

1. the flow function,
2. the distributor function, and
3. the access function.

## 5. From concept to successful implementation of sustainable safety

The systematic and consistent application of the three safety principles requires the active support of all actors, and a readiness of key stakeholders to implement measures in a coordinated manner.

In order to create a partnership amongst the key stakeholders, they:

- were involved in developing the vision,
- were invited to sign 'implementation agreements'.

The introduction of sustainable safety in the Netherlands followed the lines depicted in the diagram in *Figure 6*.

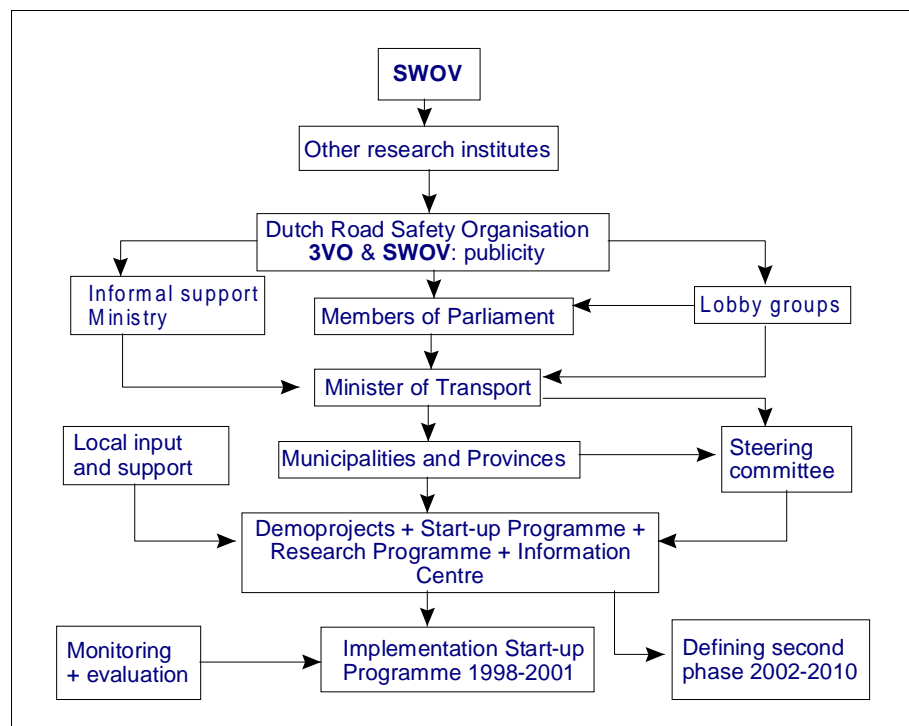


Figure 6. Description of the introduction of sustainable safety in the Netherlands.

This diagram of external experts and authorities in *Figure 6* should be read in the following context and background. Based on the experience in the Netherlands, there are certain prerequisites to make a programme successful:

- 'Launching' of the concept in which road safety experts and the professional world 'speak with one voice'. If experts disagree, policy makers and politicians don't know what to do. They will feel uncertain and may use the disagreement as an excuse to do nothing.
- There should be a general feeling - without knowing too much - that the direction is appealing especially for Members of Parliament and for the public press.

- Road safety organisations and lobby groups (stakeholders and 'actors') have to consider the concept as giving them new chances.
- In the beginning, the concept has to create creativity and not resistance. An important element with respect to this: appealing directions, not too many opportunities to be against it, and no obvious drawbacks.
- A new concept has to solve a problem in the field of road safety policy. The existing policy is not satisfactory enough to reach the targets; something 'new' is needed.
- A concept has to appeal in both the short and the long term basis. One has to realise that a concept is not written for eternity. After a certain period of time, something new is needed again.
- Integrate implementation of the concept in existing budget streams.
- Define the concept as a winner. Look for structural possibilities to connect the concept to other activities: drafting guidelines for road design, education curricula for schools, etc.
- And last but not least: find intelligent ways to commit stakeholders.

Thus, in order to implement the concept of sustainable safety as successfully as possible, the following steps should be taken:

- Organize general support about the vision.
- Show that the existing policies and programmes are not enough to reach the targets.
- Speak with one mouth.
- Show creativity and prevent resistance in the road safety community.
- Make it attractive/effective in both short and long term basis.
- Integrate implementation in existing procedures and budget streams.
- Commit stakeholders.

#### 5.1. **Start-up Programme Sustainable Safety - 'Go to the start'**

The covenant named 'Start-up Programme Sustainable Safety' sets the short-term action plans for the implementation of the first phase (start-up) of the sustainable safety programme. The actions outlined were sanctioned by the partners and are currently being actively supported and implemented by road authorities.

#### **The Dutch Start-up Programme Sustainable Safety:**

- is a document that sets out 24 implementation goals and strategies, including the time framework and the financial arrangements.
- is a formal agreement between the central government and three major road safety stakeholders:
  - Union of Local Authorities
  - Interprovincial Consultation Body
  - Union of Water Management Authorities

Sustainable safety will be implemented in two phases. The first phase covers the period 1997 to 2001 and entails a) the implementation of a coherent basket of infrastructural and educational measures, and b) the preparation of a detailed action plan for the implementation of Phase 2. As a contingency and given the extent of the programme, Phase 1 may be extended to the end of year 2002. However, the detailed action plan for Phase 2 must be completed and tabled by the end of 2001.

During 1999, decisions were made regarding the implementation of a general 30 km/h speed limit in urban areas. In support of this ruling, stakeholders were required to enter into agreements binding them to providing adequate levels of traffic law enforcement during, and after, the introduction of the new limit.

Apart from this 'planning', the programme consists of the following twelve actions: infrastructure, expansion of 30 km/h zones, 60 km/h zones in rural areas, assigning priority/right-of-way on traffic arterials, roundabouts, the moped on the roadway, priority for cyclists from the right, financing, subsidy splits between 30 and 60 km/h zones, enforcement, education and communication, and supporting measures (see section 5.3).

### **The Dutch Start-up Programme Sustainable Safety**

consists of:

- **Infrastructure and highway code:**
  - functional categorisation of Dutch road network (first step: two categories; later three)
  - speed limit in urban areas: 30 km/h with exemptions in areas where higher limits are safe
  - implementation of 30 km/h zones in built-up areas (15% in 1997, 50% in 2000)
  - introduction of rural 60 km/h zones (3,000 kilometres)
  - change of priority rules (cyclists, roundabouts, traffic arterials)
  - measure 'Moped on the motorway', no longer on cycle tracks
- **Law enforcement:**
  - large scale and intensified regional projects (alcohol, speed, safety devices).
- **Education and communication:**
  - large scale information campaigns supporting the changes in highway code
  - creation of awareness and support for sustainable safety in the Dutch society
  - improved traffic education.

## 5.2. Demonstration projects

Six large-scale demonstration projects of sustainable safety are implemented. The aim of these projects is twofold:

- to gain practical experience when applying the sustainable safety principles,
- to transfer to practitioners the knowledge about detailing the concept and the decision-making process.

Four of the demonstration projects are co-financed by the Dutch Ministry of Transport. These are: the southwestern part of the province of Zeeland, the area of Oosterbeek, the area of Grubbenvorst, and a project in the north-western part of the province of Overijssel. Other plans have been developed without such financial support. These are the areas of Westland and West-Friesland (part of the province of Noord-Holland), and some others.

*Figure 7* illustrates the estimated safety effects and costs of three different packages of measures to restructure and redesign the road network in the

southwestern part of the province of Zeeland according to the principles of sustainable safety. The road network will be divided into four categories, and the total operation involves 1,000 kilometres of roads, mainly the upgrading of roads. Intersections between the highest and the lowest categories of roads will be eliminated, and many intersections will be transformed into roundabouts.

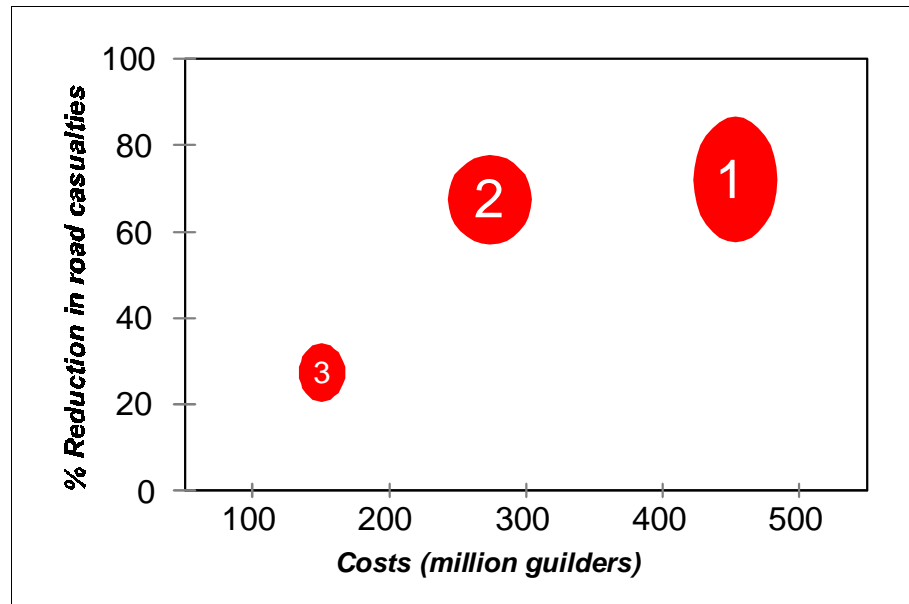


Figure 7. *Estimated safety effects and costs of three packages of measures implementing sustainable safety in the southwestern part of the province of Zeeland.*

It is important to know that all four road authorities in the region (central, provincial, municipal, and the district water board) are cooperating and are co-financing the implementation of this major restructuring of the road network. Based on the agreements reached so far, it is estimated that all construction work will be finished in the year 2000. It is important to know that public participation is considered as an essential step in this process. Furthermore, activities in the field of publicity, education, and enforcement will support the changes to the infrastructure.

### 5.3. Supporting measures

Supporting measures for the Sustainable Safety Programme were:

1. establishment of an Information Centre,
2. road safety audits and road safety impact assessments,
3. manuals and guidelines for road design (functional categorisation, design of rural roads),
4. facilities for research.

#### *Ad 1.*

A traffic and transport knowledge (technology transfer) centre was established on the basis of the VERDI agreement. To this end, an information centre (Information Point Sustainably Safe), dedicated to

providing technical and other support to the implementation of the Sustainable Safety Programme, was established. The information centre facilitates the exchange of knowledge, provides technical support (guidelines, layouts, etc.) and is the medium where road authorities can exchange ideas and experiences during implementation. The cost of running the centre is borne by the government. Internal communication (i.e. within the structures of road authorities) was the responsibility of that particular authority or organisation.

*Ad 2.*

Before 1st March 1998, the road authorities, in consultation with practitioners (consulting engineers, police, road safety specialist, etc.) should develop a protocol for the execution of Road Safety Audits. The development costs were borne by the central government. The Union of Local Authorities, the University of Wageningen, the Interprovincial Consultation, and the Ministry of Transport ensure that local, provincial, and national road authorities and practitioners are made aware of the road safety audit procedures and processes. The cost of executing an audit will be borne by the end user.

*Ad 3.*

The state, in collaboration with road authorities, should ensure that the guidelines of the Dutch Centre for Research & Contract Standardization & Traffic Engineering CROW are published for the design and layout of sustainably safe roads. In consultation with road authorities, design criteria were tested in pilot applications and demonstration projects (see section 5.2). By the 1st of January 1999 definite design guidelines were published and circulated to end users.

*Ad 4.*

By the end of the year 2000, local, provincial, and national road authorities should have classified their road networks on the basis of the CROW guidelines. Although no definite arrangement was made for the coordination of this process, provincial road authorities took it upon themselves to undertake this. To ensure that discrepancies in the road networks across municipal, provincial, and other boundaries are minimised, responsible road authorities coordinate and communicate with neighbouring authorities in this regard.

#### 5.4. **Financing sustainable safety**

The investment costs of the Start-up Programme Sustainable Safety - 'Go to the start' - were 200 million Euro.

The central government planned to provide 50% subsidy, but at the moment new financial and new commitment arrangements are still being developed.

Estimates have been made to investigate what the complete introduction of a sustainably safe traffic system would cost. The first SWOV estimates resulted in 60 billion (Dutch) guilders (i.e. c.30 billion Euro). This is for a highly-industrialised and motorised country with an area of c.40,000 km<sup>2</sup> and a population of nearly 16 million. A major proportion of this money should be invested in adapting the existing road infrastructure according to the principles of sustainable safety.

Based on different, recent, and more detailed estimations - especially based on the demonstration project in the western part of the province of Zeeland (see section 5.2) - a more sober implementation would cost 30 billion guilders (i.e. c.15 billion Euro). SWOV has suggested to spread these investments over a period of 30 years in order to run these investments in parallel with the standard maintenance of the road infrastructure. A period of 30 years is a reasonable one for the Dutch circumstances.

### **Financing Sustainable Safety**

- **Background:**

- Socio-economic costs are estimated at 6 billion Euro per year, i.e. 2% of the Dutch Gross National Product.
- Available road budgets are 3.5 billion Euro per year.

- **Assumptions:**

- Road investments are spread over a 30 years period.
- Investments are integrated in road rehabilitation, maintenance and plans for new layout.
- Costs are 15 billion Euro, or 0.5 billion Euro per year.

- **Expected benefits:**

- approx. 60% reduction in the number of road casualties,
- rate of return of 9% of the investments (only 4% is required by the Ministry).

If we invest 30 billion guilders over a period of 30 years, we estimate a reduction of 60% of the number of road accident casualties. Even if we use a conservative basis for cost-effectiveness estimates, SWOV concludes a cost-effectiveness of 9%. This is considerably higher than the customary government standard of a 4% return on investment for infrastructure projects. The next question is why such cost-effective investments have not yet been made.

A part of the answer might be that the benefits of a sustainably safe traffic system do not go to those who have to invest. The benefits of a sustainably safe traffic system can be divided into the effects for various groups: government, private individuals, and employers.

The group of private individuals and employers would benefit most, such that a proportional investment would be profitable in this case. However, this leads to a kind of paradoxical obstruction. If only the odd individual invests, no gains are made; if many invest, the benefits are also shared by those who do not contribute. In order to still encourage individuals or companies to invest, government intervention is likely to be necessary. Insurance companies (both of motor vehicles, as well as life and health cost insurers) who would also profit from the steady drop in claims - and hence in payments - could be employed as intermediary for this purpose. But from this perspective, it might become clear that the key stakeholder to achieve a sustainably safe road traffic system, is the government; either directly as investor, or indirectly as 'broker'.

