Road safety policy in the Netherlands: facing the future

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1. Setting the scene

The early 1970's may be considered as a turning point in the history of road safety in the Netherlands.

From the end of World War II to the early 1970's, the number of recorded traffic fatalities increased to a yearly maximum of approximately 3,300; mass-motorisation being its major cause. The intensely felt threat of traffic was no longer accepted by the public at large. A hot debate, the setting-up of pressure groups, etc., induced actively applied road safety policies to curtail the problem. Measures taken over time with a large positive effect were, for instance: new traffic legislation (e.g. speed limits, drinking-and-driving legislation), the expansion of the motorway network, traffic calming measures in built-up areas, the physical protection of car-occupants and moped drivers, education, information, and other means of influencing road user behaviour, and stimulating decentralisation.

As a result, the number of recorded traffic fatalities incessantly decreased to approximately 1,100 in the year 2000, despite the fact that mobility almost doubled over the same period of time (Figure 1). The number of recorded casualties with serious injuries, which is approximately 12,500 at present, has shown about the same trend. The estimated degree of registration is 93 % in the case of fatalities and 64 % for serious injuries. These days, the traffic fatality rate per 100,000 inhabitants amounts to 6.9 (cf. France: 14.3).

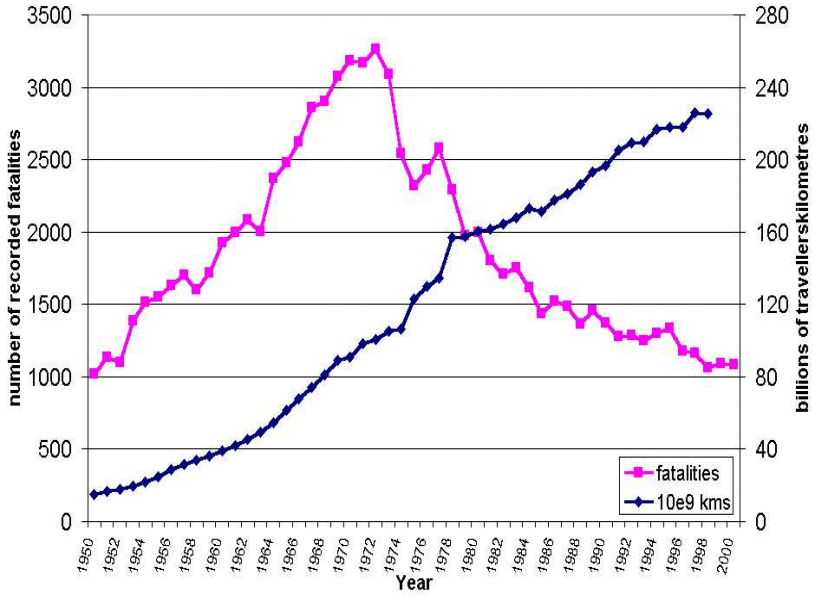

Figure 1. *Trends in mobility and actual recorded traffic fatalities. (Source: the Netherlands Transport Research Centre (AVV), Department for Statistics and Data Management, and Statistics Netherlands).*

Although the road safety record of the Netherlands ranks among the best in the European Union, the accident toll is still to be considered as unacceptably high. In line with this, recently new targets for reducing the number of road accident fatalities and serious injuries have been set in the ‘National Traffic and Transport Plan for the Netherlands, 2001 - 2020' (NVVP). According to planning, the NVVP will be considered in both Houses of Parliament in the foreseeable future.

The NVVP targets for the year 2010 include a 30 % reduction in fatalities and a 25 % reduction in serious injuries (related to 1998 data). In order to meet this challenge, important elements of the present-day national policy, as formulated in the NVVP, are going to be the cooperation between and the sharing of responsibilities among all parties involved in traffic and transport policies, and a much intensified implementation of the long-term road safety approach of ‘Sustainable Safety’.

2. Present-day road safety policy in the Netherlands in historical perspective

As stated above, road safety has had high political priority in the Netherlands for the last decades. During this period, safety action taken over time was of a multifarious nature.

In 1983, a ‘National Plan for Road Safety’ was issued. Like in many other countries, the then customary philosophy was: ‘the solution to the problem is to take away its cause’. In fact, the policy plan can be characterised as an extensive list of measures of this kind. Soon it was recognized, however, that some drawbacks adhered to such a ‘mono-causal’ approach, since it did not take into account that a solution for one cause might raise problems of another kind, nor that a different solution might solve other problems as well.

Facing the complexity of the road safety problem, as well as the difficulties of embedding solutions in society, safety initiatives became more centred around the divergent and sometimes conflicting functions of the ‘public space’. Traffic had to be kept flowing, city(-centre)s accessible, economic life alive, etc., and at the same time the lack of safety of travel and transport had to be obviated. In view of this, principles were developed on the segregation and/or integration of incompatible travel modes and/or traffic participants, on a hierarchical road-infrastructure, on pedestrian precincts, on bicycle paths and routes, on traffic circulation, etc. This resulted in an integrated road safety philosophy, which has been the basis of long-term road safety policy plans (MPV s) since the mid-1980's .

The first ‘Long-term Road safety Plan’: MPV-I, was issued in 1987. Its theme was: ‘More kilometres, less accidents’. The plan set a target of minus 25 % injury accidents for the period 1985 - 2000. To realise this, ‘spearheads’ or focus areas were defined on alcohol, speed, hazardous locations, children, the elderly, and safety devices. Basically, the approach had a reactive and curative character, aimed at addressing problems when and where they occurred.

The theme of MPV-II, released in 1989, was ‘Ambitious, but attainable’. It paid further attention to the spearheads. Apart from this, it emphasized the importance of participation in the policy processes by local and provincial authorities and other stakeholders. Soon after, the road safety target was redefined and accentuated in the second ‘Structure Plan for Traffic and Transport’ (SVV-II). Thus, in 1990 the target became: a 50 % reduction in fatalities and 40 % in injury accidents for the period 1986-2010.

In the early 1990's, it was no longer taken for granted that the latter targets would be met by means of the spearhead policies alone. It also became obvious that the spearhead policies were not effective in addressing problems at their source. Accident analyses indicated, for instance, that remedial action was necessary to reduce the differences in fatality and injury accident rates on different road classes. In a study, entitled ‘Towards a sustainably safe traffic system’ (Koornstra et al., 1990), an outline of a new vision was developed for coping with the road safety problem in the

next decades. It stressed the need for a preventive, structural and enduring kind of approach. In response, MPV-III, issued in 1991, adopted a ‘twin pronged’ policy of renewing and intensifying the spearhead approach on the one hand, and the implementation of this ‘Sustainable Safety’ vision on the other.

3. Sustainable Safety: the concept and its elaboration

The starting point of the concept of ‘Sustainable Safety’ is to drastically reduce the probability of accidents in advance, by means of infra-structural design. In addition, where accidents still occur, the process which determines the severity of these accidents should be influenced, so that serious injury is virtually excluded.

The concept is based on the principle that “man is the reference standard.” A sustainably safe traffic system has an infrastructure that is adapted to the limitations of human capacity, through proper road design, vehicles equipped with tools to simplify the tasks of man and constructed to protect the vulnerable human being as effectively as possible, and a road user who is adequately educated, informed and, where necessary, controlled.

The key to arrive at a sustainably safe traffic system lies in the systematic and consistent application of three safety principles:
- functional use of the road network by preventing unintended use of roads;
- homogeneous use by preventing large differences in vehicle speed, mass and direction;
- predictable use, thus preventing uncertainties amongst road users, by enhancing the predictability of the course of the road and the behaviour of other road users.

As stated before, the *road user* as the reference standard represents the central element in a sustainably safe traffic system. He/she must be prepared to accept an infrastructure, vehicles, rules of behaviour, information and control systems, that may restrict his/her individual freedom, in return for a higher level of safety. If this willingness is not present, resistance will be the result. Perhaps, the willingness to accept all elements could be achieved by ‘social marketing’. Freedom restrictions without good arguments should not be offered to the road user.

Education could and should play an important role in the transition period from the traffic system of today to the sustainably safe system. Education could concentrate on the whys and wherefores of sustainable safety. Public awareness, public participation, and education should create support for implementation and find their place alongside implementation of other key elements of this vision.

With respect to *vehicles*, the diversity of vehicles 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. In the sphere of passive sustainable safety provisions lie those that work independently of the driver or the passenger: ‘built-in’ devices like solid passenger compartments of cars, combined with crushable zones and air bags (in addition to the compulsory use of seat belts). Improvement of the front-end design of passenger cars, to reduce injuries to pedestrians and cyclists, is relevant as well.

In the field of active safety a lot of progress may be expected from devices which provide relevant information to the road users, improve their observation, or simplify their tasks (emergency manoeuvres). The practical application of electronic equipment is now being emphasized. An interesting development is the so-called Intelligent Speed Adapter. This device prevents the speed of a vehicle from exceeding a location-specific maximum, on the basis of electronically sent signals from its surroundings. The technology for the components of this device is available; integration of these components has not yet been realized, however. Two real 'problems' have to be solved: gaining public acceptance and support, and developing an introduction strategy.

The three safety principles (functional use, homogeneous use and predictable use) require the specification of the intended function of each *road and street*. Roads should be built with one of three major traffic functions in mind. These are:

- the flow function: enabling high speeds of long distance traffic and, often, high volumes;
- the distributor function: serving districts and regions containing scattered destinations;
- the access function: enabling direct access to properties alongside a road or street.

Besides a traffic function, streets and roads in built-up areas should allow people to stay in the vicinity of their house safely and comfortably. This so-called residential function could well be combined with the access function.

The concept of sustainably safe road transport comes down to the removal of all function combinations by making the road mono-functional, i.e. by creating categories of roads: pure through roads, pure distributor roads and pure access roads. Multi-functionality leads to contradictory design requirements and also to higher risks. *Table 1*. indicates the risk levels of different road types, and from this we learn that applying the safety principles, as was done on motorways and in 30 km/h-zones, leads to relatively low risks (Janssen, 1988).

Road type	Speed limit	Mixed traffic	Intersecting/ oncoming traffic	Injury rates per 10^6 veh.kms
Residential areas	30	yes	yes	0.17
Urban street	50	yes	yes	0.61
Urban artery	50/70	yes/no	yes	1.08
Rural road	80	yes/no	yes	0.46
Express road or road closed to slow-moving vehicles	80	no	yes	0.21
Motor road	100	no	yes/no	0.08
Motorway	100/120	no	no	0.05

Table 1. *Injury rates in the Netherlands on different road types.*

The differences between the existing approach to categorise a road network and the sustainably safe approach are depicted in *Table 2*.

Common practice at present		Sustainably safe practice	
Existing types of roads	Function	Function	Sustainably safe types of roads
	Traffic function	Traffic function	
Motorway	Increasing flow and decreasing access	Flow	Ia. Motorway
Motor road			Ib. Motor road
Main distributor		or	IIa. Distributor road (rural)
Local distributor		Distributor or	IIb. Distributor road (semi-urban)
District artery	Decreasing flow and increasing access	Access	IIIa. Access road (rural)
Neighbourhood artery			
Residential street			IIIb. Access road (urban)
Woonerf			
	Residential function	Residential function	

Table 2. *Common practice and sustainably safe practice of categorising roads and streets.*

Based on our existing knowledge, functional requirements for design criteria have been developed for a sustainably safe traffic system (Van Minnen & Slop, 1994):

- make residential areas as large as possible;
- let the main part of every trip be travelled over the safest type of road;
- make routes as short as possible;
- let the shortest route coincide with the safest route;
- prevent search behaviour for destinations;
- make road types recognisable;
- reduce and uniformize design characteristics;
- prevent conflicts between on-coming traffic;
- prevent conflicts between crossing traffic;
- separate different transport modes;
- reduce maximum speed where conflicts could occur;
- prevent obstacles alongside a road.

Recently, these functional requirements have been made operational in ‘draft guidelines’ by a CROW working committee (CROW = information and technology centre for transport and infrastructure) (CROW, 1997). An example of these guidelines for roads outside urban areas is presented in *Table 3*.

Design criteria	ROADS OUTSIDE BUILT-UP AREAS		
	Through road	Distributor road	Access road
Speed limit	120/100	80	60
Longitudinal marking	complete	partly	no
Cross section	2x1 (or more)	2x1 (or more)	1
Road surface	closed	closed	open
Access control	yes	yes	no
Carriageway separation	yes, physical	yes, visual, to be crossed over	no
Crossing road sections	grade separated	grade separated	at grade
Parking facilities	no	no	parking space or on the carriageway
Stops for public transport	no	outside the carriageway	on carriageway
Emergency facilities	emergency lane	in verge or on hard shoulder	no
Obstacle free zone	large	medium	small
Cyclists	separated	separated	depending
Mopeds	separated	separated	on carriageway
Slow motorised traffic	separated	separated	on carriageway
Speed reducing measures	no	appropriate measures	yes

Table 3. *Design criteria for road sections outside built-up areas.*

4. Sustainable Safety: the concept and its implementation

The consistent application of the three safety principles of Sustainable Safety on the functional, homogeneous and predictable use of the road network, as mentioned in Ch. 3, requires the support of all actors and their commitment to implement measures in a coordinated manner. In order to create such a partnership, the key stakeholders had to be involved in developing the vision and its implementation.

With a view to promoting and enhancing the implementation of measures of this kind, the central government, the representative bodies of the provincial and the local administrations, and the union of water-management authorities agreed upon an action programme for the period 1997 - 2002. This so-called 'Start-up Programme', regarding in fact the first phase of their combined efforts, constitutionalised the tasks and shared responsibilities, as well as the planned programme of measures. The central government were providing one half of the total financial means required (approximately • 240 million); the other partners the second half.

The following measures are part of this Start-up Programme:

- road classification programme (for the complete road network of more than 100,000 kms. of road length), which lets roads fulfill their functions satisfactorily and forms a basis to solve the problems of contradictory design requirements;
- stimulate a low-cost introduction of 30 km/h-zones inside built-up areas (excl. roads with a flow function and with a distributor function); an extension of possible 30 km/h-zones, from 10% at the start to 50% -to be realized by the year 2000- was agreed upon;
- use simple means to introduce 60 km/h-zones for minor rural roads; aiming for some 3,000 kms of road length in 60km/h-zones to be realized in 2000;
- if necessary and possible, infrastructural measures like cycle facilities, roundabouts, and small-scale measures to support 30 km/h-zones and 60 km/h-zones;
- inside urban areas mopeds on the carriageway instead of on cycle tracks or cycle paths;
- indication of priority at every junction (outside the 30 km/h-zones); bring the priority rules for cyclists and mopeds into line with the rules for motorised traffic;
- public information campaign to support the introduction of Sustainable Safety; better law enforcement by the police and education programmes;
- the introduction of a road safety audit;
- intensified surveillance and traffic law enforcement;
- supportive measures for knowledge transfer, and
- the planning of the second implementation phase of Sustainable Safety.

On the verge of this first stage of implementing the Sustainable Safety programme, the recently proposed 'National Traffic and Transport Plan for the Netherlands, 2001 - 2020' '(NVVP) will be considered in Parliament.

With regard to safety, the proposal defines and clarifies the responsibilities of all stakeholders. The adage is: "decentralised, if possible; centralised, if

necessary”. Moreover, it states: “Greater mobility should not be achieved at the cost of safety and quality of life. There is a notable pay-off to be achieved here in further reducing traffic casualties, hence the follow up of the Sustainable Safety Programme.” This programme involves boosting the safety of the infrastructure, training, information, and stricter enforcement of traffic rules, as well as measures to reduce the pressure on the subsidiary road network, which will benefit its safety.

5. Lessons learned

Specific elements in implementing the Sustainable Safety approach turned out to be at least supportive of, or were even a prerequisite for successful action:

- The conviction that the current policy was not sufficiently effective in reaching the targets. Thus, something ‘new’ was needed: a new concept to solve the road safety problem.
- Road safety experts and the professional world should express themselves in full accordance with the new concept. If experts disagree, policy makers and politicians will feel uncertain and decisions might be postponed.
- The concept has to appeal in both the short and the long term. Of course, no concept is drawn up for all eternity.
- From the start, the concept has to enhance creativity and not resistance. An important element with respect to this: appealing directives and no obvious drawbacks.
- road safety organisations and lobby groups (stakeholders and ‘actors’) have to consider the concept as offering them new opportunities.
- Implementation of the concept must be integrated in existing budget streams.
- Structural opportunities to connect the concept to other activities should be looked for and created: drafting guidelines for road design, education curricula for schools, etc.
- Last but not least: intelligent ways to commit stakeholders have to be found.

Therefore, one may conclude that the following steps are to be taken, in order to implement the concept of Sustainable Safety as successfully as possible:

- Show that the existing policies and programmes are not enough to reach the targets.
- Organize general support about the new vision and express this in an unambiguous way.
- Show creativity and prevent resistance in the road safety community.
- Make it attractive / effective in both the short and the long term.
- Integrate implementation in existing procedures and budget streams.
- Commit all stakeholders.

A final remark
Sustainable Safety offers a lasting solution for the road safety problem in the long term and at considerable cost. However, “investment precedes profit”, as a Dutch proverb on the facade of the former Bourse of the city of Amsterdam states.

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