INTRODUCTION

People need to be able to travel for their work, social life and recreation, and to make use of health care and other facilities. Goods need to be conveyed to companies, shops and consumers. Mobility is an important element in the social and cultural development of people and society. An efficient, safe and sustainable transport system is essential to prosperity and well-being. Mobility must be available to all groups in society, yet within the limits of assured road safety and an acceptable environment.

With its National Traffic & Transport Plan NVVP 2001-2020, the Dutch government has given a new impetus to strengthening existing policy on road safety, and its implementation.

OBJECTIVES AND APPROACH

The Dutch government is largely responsible for the provision of transport infrastructure, regulating public transport and steering this. The government supplies the infrastructure, regulates the market and commissions public transport, and as such has a major influence on the quality of the transport system. Yet the government is not solely responsible for transport, nor is it solely responsible for the problems. The users themselves (road users and commercial enterprises), through their individual choices, together determine the ultimate outcomes. There is shared responsibility in seeking solutions which are supported by society. Co-operation between authorities and with the private sector is needed for issues such as reducing private car use; policy on commercial land use development and car parking; urban distribution; and the area-targeted approach of regional transport plans and municipal planning. The basic principle of co-operation requires a clear division of roles and responsibilities.

The Netherlands was the first country to formulate quantitative targets for road safety. In 1987 the first Long-Range Plan for Road Safety MPV was published. The year 2000 target formulated in the plan was 25% fewer road accident victims compared with 1985.

The Second Transport Structure Plan SVV of 1990 subsequently reduced the targets for 2010, to 50% fewer road deaths and 40% fewer injuries compared with 1986. In order to achieve these targets, the policy adopted two approaches: firstly, the ‘spearhead’ approach
focusing on alcohol, speed and protective devices in cars; and secondly, the more preventive approach of 'sustainable safety' through road infrastructure.

The current National Traffic & Transport Plan NVVP of 2001 maintains these objectives. This is ambitious, because mobility has increased more than was expected ten years ago. Retaining the absolute target thus represents a higher goal in practice, especially because the law of diminishing returns is in operation, so more complex and more expensive measures will have to be taken.

The present targets for 2010, taking 1998 as the base year, are:
- fewer road deaths, down to 750 per year (-32 % compared to 1998);
- fewer hospital admissions due to road accidents, reduced to 14,000 per year (- 25% compared to 1998).

Compared with the new reference year of 1998, these targets for 2010 mean that the number of road deaths must be reduced by over 300, and the number of hospital admissions by 4,600.

These national targets have been translated into regional targets. Different road authorities take their shared responsibilities in fulfilling the targets, laid down in formal agreements between them and the national government.

The cost of road accidents in The Netherlands is estimated at 7 billion US $ per year (loss of production, medical costs, material costs), or 13.5 million US $ a day.

A reduction in the number of road accidents will therefore also yield an economic return. It has been calculated that achieving the above policy will reduce the cost to society by an amount in the order of 1.2 billion US $ a year in 2010 and the years thereafter; a rate of return of 7 per cent per year. In fact, there are no good reasons conceivable for not investing in road safety!

To achieve these goals in the area of road safety, an integrated safety approach to person-vehicle-road has been adopted. This results in a range of measures which give the most effect at a reasonable cost. A so-called 'risk approach' (numbers of victims in relation to mobility) makes it possible to determine where there is a hazardous situation, where the hazard is greatest, where, and in what combination measures should be taken. Targets for this are currently being formulated for each region; these will be discussed with all the regional partners concerned and in 2002 they will be definitively agreed and adopted in joint administrative discussions. This will make it possible to set priorities.

'SUSTAINABLY SAFE' TRANSPORT SYSTEM

The ‘sustainable safety’ approach and programme is currently being implemented in The Netherlands.

A ‘sustainably safe’ transport system involves co-ordinating the interaction between road users, the road infrastructure and the vehicle in relation to each other; there is also an organizational co-operation aspect. The concept is based on the principle that man is the measure of things. A sustainably safe traffic system has a road infrastructure which is adapted to the capabilities and limitations of the road user; uses vehicles which simplify the driving task and are constructed in such a way that they effectively protect the occupants and other vulnerable road users; and serves road users who are adequately trained, and if necessary subjected to checks.
This approach was first proposed by the SWOV Institute for Road Safety Research in 1992 in the document entitled Towards Sustainable Safety in Road Traffic (Naar een Duurzaam Veilig Wegverkeer). The basis for a sustainably safe transport system lies in the systematic and consistent application of three safety principles:
- functional use of the road network by preventing unintended use;
- homogeneous use of the road network by preventing large differences in vehicle speeds, vehicle masses, and direction of travel;
- predictable use of the road network by rectifying uncertainties in road behaviour and introducing predictability into the way in which the road proceeds.

The three safety principles can be translated into road specifications, which are divided into a different road types according to function:
- flow function: through roads with high intensities and high speeds;
- district distribution function: roads connecting the through road network to the lowest order access road network;
- access function: roads giving access to residential areas, industry parks, shopping areas, sports centres.

These basic principles result in two categories of roads within the built-up area (distributor roads and access roads), and three categories of roads outside the built-up area (freeways, rural distributors and rural access roads).

The Netherlands supports an integral approach to road safety. Controlling road users’ speed will also be approached from this point of view. Efficient and effective methods of controlling speed include infrastructural measures, influencing behaviour (public information, surveillance) and ITS applications.

**SPEED BEHAVIOUR**

Drivers appear to set themselves an internal speed limit which, in their judgement, is the appropriate speed for them at that time and place under the prevailing conditions. The internal speed limit is often above the signposted speed limit. Mopeds are often ‘tuned up’, many drivers get a kick out of driving too fast. Speed limits are exceeded en masse and many road users think that exceeding the limits is no big deal. As a result speeding is widespread.

Whilst speeding is acknowledged as illegal, it is justified by drivers on a number of grounds. According to a study done by Ross Silcock Limited in the United Kingdom, the most common attitudes can be paraphrased as:
* unintentional;
* in a hurry (e.g. to collect a child from school);
* being “forced” to speed (by someone tailgating me);
* the limit is wrongly set for this location (based on experience of similar roads with higher limits);
* my modern car can stop more quickly than those on the roads at the time the limit was set, therefore my speeding is safe;
* the same limit should not apply at all times (when the road is empty, late at night);
* the limit does not apply to me because I am an above-average driver; and
* my speeding is acceptable because it is not a lot over the limit and others abuse it more flagrantly.
Some also linked choice of speed to in-vehicle safety features such as air-bags and side-impact bars. Their presence give some people confidence in driving faster.

This does not mean that all speeding is acceptable in the public’s mind. But there is a dichotomy between “my” speeding and “others” speeding, which is not always accepted. It shows from this study that there is also a view that a modest amount over the limit doesn’t do any harm. The problems are caused by “boy racers” and “company car drivers”; not “me”. It may be that using these stereotypes is one of the means by which speeders justify their behaviour, as they will rarely admit to belonging to one of these groups.

The fact that speeding is so widespread reinforces the view that there is little chance of detection and prosecution, for moderate speeding at least. It is also a widespread belief that the police allow a fair degree of tolerance on top of the legal limit.

The conclusion of this study was that speeding is not seen as a crime. Whilst “serious speeding” is accepted as dangerous, “moderate speeding” is not.

From the literature it appears that the most important indicator of a person’s immediate attitude towards exceeding the speed limit is usually their driving pleasure. Risk and police enforcement are generally of secondary importance in determining attitude in relation to the driving speed adopted.

THE SPEED PROBLEM

Newtonian physics implies that higher speeds will increase the crash risk due to a reduction in the available friction, leading to risk of loss of control, reduced time-to-collision, and crash forces increasing by the square of speed. On the basis of extensive research on the relationship between speed, speed limits, and accidents, it is estimated that, depending on the road category, a 1 mile per hour reduction in the mean traffic speed could produce a 2 to 7 percentage point reduction in the number of injury accidents.

Other researchers have pointed to the importance of speed variance: vehicles moving much slower or faster than the mean traffic speed tend to be over-represented in accident statistics. So it is not just high speeds which increase the risk. The curve is U-shaped: car drivers in the lowest speed range as well as those in the highest are more often involved in road accidents than drivers in the middle category. The safest driving speed is that which is maintained at or around the average speed.

In Europe over 42,500 people (800 every week) are killed on EU-roads and more than 3.5 million persons are injured in road traffic accidents each year. The estimated cost of all these crashes within the EU is over 160 billion Euro: an incredible figure. It is around twice the EU budget and close to 2 percent of GDP.

It appears from European figures from ETSC that speed contributes to one third of fatal and serious crashes; 13,000 fatalities in Europe. Two in three drivers exceed the speed limit in urban areas; and one in two drivers exceed the limit on single lane rural roads.

Better speed management, which can reduce average speeds by 5 km/hr, could save as many as 9,000 lives annually in the European Union!

On urban arterial roads where a speed limit of 50 km/h applies, it seems that when cars involved in an accident with pedestrians are travelling at 40 km/h, 70% of the pedestrians survive. At a speed of 60 km/h this figure falls to just 15%.
This paper concentrates on countermeasures to influence speed, directed at the main elements of a sustainably safe road traffic system: road user behaviour, the road infrastructure and vehicle technology.

**INFLUENCING BEHAVIOUR**

The most important key in the approach to road safety is road users’ behaviour. The vast majority of road accidents are ultimately attributed to the consequences of human error; even if only because legally a guilty party must be found from whom to obtain redress for the consequences of the accident.

Drivers are bombarded with a constant stream of information, both visual (the road, other vehicles, pedestrians, road signs, intersections, etc.) and auditive (listening to the radio, mobile phone calls, conversations with passengers, etc.). A driver processes all this information to a greater or lesser extent.

However, prior to this, it is also possible that a driver may not have seen a situation. This could be because the light or visibility was poor, or because the driver happened to be looking the other way. Research has shown that observation errors play a part in one-third of road accidents. The fact is that we are human, and we do not observe well.

While it is true that well laid-out roads can reduce the risk of road accidents, the road users themselves are ultimately at the wheel. By promoting safe road use through education and public information, road users can become more responsible. People’s understanding of the relationship between road infrastructure, road use and speed behaviour, road accidents and the ensuing injuries therefore has to improve.

The imposition or lowering of speed limits has usually reduced the frequency and severity of crashes. Speed limits have, of course, a key role to play in speed management, and are especially important on those types of road where infrastructure design has limited influence on speed choice.

Police enforcement is one of the possible measures to change undesirable traffic behaviour and thus reduce the number of traffic accidents. Intensified speed enforcement can reduce average speeds on national roads by 2.5 km/h. This has been translated as a reduction of 12.5 per cent of all serious injury accidents occurring on these roads.

**DUTCH ENFORCEMENT PILOT STUDIES**

In co-operation with the Dutch Bureau of Traffic Enforcement (BVOH) of the Ministry of the Interior, the SWOV Institute for Road Safety Research has set up a research programme to evaluate a 4 year-long national police enforcement intensification programme in The Netherlands, which is to be carried out in 8 of the 25 police regions. The stepped-up enforcement programme will focus on 5 main areas: speeding on trunk roads and urban through-roads, drinking and driving, red light running, seat belt use and helmet use by moped riders. The enforcement programme takes a regional approach and is tailored to each region based on a problem analysis of each regions’ specific traffic safety situation. Regional targets have been formulated and the programme is supported by public campaigns.

To be able to effectively apply different enforcement tactics and strategies, all enforcement activities need to be systematically monitored and evaluated. Besides considerations related to the cost-effectiveness of police enforcement, one of the main objectives of the study is to
gain a clearer understanding of the social and cognitive processes underlying these effects, and to identify the conditions under which enforcement can have a more sustainable effect on drivers’ speeding behaviour.

As part of every regional plan speed measurement induction loops will be installed on all road stretches to enable stricter enforcement (30 to 40 in each region). The data (including a self-reported survey among 6,000 drivers) will become available in 2003.

Public information and communication are essential to inform road users about the relationship between their speeding behaviour and road safety. In some countries it is clear that information about the important role that speed plays in crashes is not getting through to road users. We need to enhance public awareness of the consequences of driving at high and inappropriate speeds and that there is a good chance of getting caught.

Through public information and publicity campaigns it may be possible to increase people’s subjective perception of the possibility that they might get caught. Something which is unlikely to occur objectively, but this perception could influence attitudes in relation to the speed limits in force and thus ultimately have a positive effect on speeding behaviour.

According to Norwegian research, the relationship is as follows.

Increasing enforcement on a given road by three to five times increases the subjective risk of detection, reduces the numbers of offenders, and may reduce the number of accidents by about 10-20 per cent.

Increasing enforcement on a given road by more than five times increases the subjective risk of detection, reduces the percentage of offenders, and may reduce the number of accidents by up to 20-30 per cent.

The Dutch government is supporting the following experiments in this field.

~ National public information campaigns are a permanent part of The Netherlands road safety policy. The effectiveness of national and regional campaigns is increasing due to their inclusion as an integral part of regional projects.

~ The government aims to extend the eight pilot studies with intensive police supervision of regional enforcement of the traffic regulations in all 25 police regions in The Netherlands.

~ The government will step-up the enforcement of speed limits on the motorway network, through extra deployment of the national police force. In 2001 9.2 million fines were imposed by the police, 70 per cent of which were for speeding.

**ROAD INFRASTRUCTURE**

In an integrated approach to road safety, improving the road infrastructure cannot be carried out in isolation. One of the main elements included in the agreements on improving the infrastructure is a more detailed classification of the road network. The road authorities hold primary responsibility for the safe lay-out of the infrastructure. Guidelines for a sustainably safe lay-out are being developed within this framework.

It is important to realize that with a better road classification system which has uniform design specifications for consistency, drivers can more easily determine the desirable level of speed from the road design itself. This is the concept of “self explaining roads”, advocating a traffic environment that elicits safe behaviour simply by its design.
We need to bring together best practice in self-explaining roads and match them with appropriate limits and road lay-outs.

The most serious road safety problems in The Netherlands are found on the urban arterial roads and on the regional through roads. It is therefore the municipalities and provinces which face the biggest challenge. Achieving a sustainably safe infrastructure usually has to be ‘made-to-measure’. Consequently, road authorities within a region must work together to develop integrated packages of measures on the basis of regional targets. To support the regions, a catalogue of measures has been developed and published. The document outlines the effects that various, mainly infrastructural, measures, may have on road safety.

The European project MASTER (Managing Speeds of Traffic on European Roads) summarised the following findings.

# In built-up areas, residential areas and traffic calming zones, speed humps and road narrowing are fairly effective in reducing driving speeds. Road surface treatments are also effective in reducing high speeds. However, negative side effects are also reported such as decreased driving comfort at low speeds, abrupt braking patterns, and increased noise levels. [In The Netherlands, the ‘woonerf’ has led to a substantial reduction in driving speeds and in the number of injury accidents; in some projects a 70 per cent reduction of injury accidents has been reported. Since 1983, the Dutch road authorities have been able to set a legal limit of 30 km/h on roads or in zones in built-up areas. Here too, the effect on speeding behaviour has been substantial and the number of serious injury accidents has dropped by more than 30 per cent. Where intersections have been changed into roundabouts, the total number of recorded accidents has fallen by almost 50 per cent. In fact, the overall number of accident victims has reduced by about 70 per cent. The lower approach speed to the roundabout being the main causal factor here.]

# Rural roads show the most varied speed choice patterns and frequently score highest in accident rates. At specific locations on these roads, driving speeds can be reduced by placing transverse road markings or rumble strips. Longitudinally placed rumble strips also reduce comfort when taken at high speed, require more accurate lane keeping, which is usually only possible at a reduced driving speed. Advisory speeds may serve as a warning for dangerous locations, but will only lead to actual speed reductions if drivers understand the reason for the warning. Decreasing visibility distances by increasing curvature, rising and falling gradients, vertical elements and measures such as reducing lane width, may help to reduce speed, but could also become potential hazards themselves.

# Motorways have the highest design standards. Usually, the concept of design speed is used, a speed a driver can maintain comfortably under normal traffic and weather conditions. The whole geometric design is based upon this assumption. Drivers have a high level of expectancy about this and behave accordingly. In substandard conditions on motorways, drivers should be explicitly warned. Variable Message Signs (VMS) are frequently used in combination with dynamic speed limits to regulate and guide the traffic on motorways. Depending on the visibility conditions, for example, a fog warning can be given together with an appropriate speed limit. In The Netherlands, when such a system is used in dense fog conditions speed reductions of 8 to 10 km/h can be achieved.
VEHICLES AND TECHNOLOGY

The authorities are promoting the development, standardisation and implementation of technology to improve road safety. New technology for motor vehicles can greatly improve road safety. The priorities in applying new technologies lie in the following areas.

The policy gives top priority to projects which reduce the risk of injury to vulnerable road users, such as pedestrians and cyclists, and reduce serious injury to vehicle occupants. One of the areas focused on is the prevention of whiplash.

Current trends in car design, which insulate drivers from feedback about their speed, are acknowledged as a factor which contributes to speeding. But there are a variety of ways in which intelligent vehicles could provide appropriate feedback or remove the decision about choice of speed from the driver.

On 1 January 1995 the speed limiter became mandatory in trucks heavier than 12 tonnes and built after 1-1-1988. On the same date the speed limiter was made mandatory in buses heavier than 10 tonnes. The purpose of the mandatory speed limiter was to prevent trucks from driving at very high speeds. The vehicle regulations laid down that the speed limiter for heavy trucks should be set at 85 km/h and that 90 km/h must not be exceeded. The current speed limit is 80 km/h. The regulations specify that buses heavier than 10 tonnes and built after 1-1-1988 must not be able to exceed a speed of 100 km/h. The current speed limit is 80 km/h.

Furthermore, in 1995 the Minister of Transport concluded an agreement with organisations in the motorcycle sector to end the phenomenon of tuning up ‘snorfietsen’ (mopeds subject to a speed limit of 20 km/h). The sector has since promised not to introduce any mopeds onto the market which fail to meet the European Directive intended to prevent this.

Technology can also be used to influence driving behaviour, and is therefore an essential part of road safety policy. Systems are being developed which support and simplify driving, such as various forms of Automatic Vehicle Guidance AVG.

INTELLIGENT SPEED ADAPTATION ISA

Intelligent Speed Adaptation ISA is an example of technological innovation for greater safety. The speed of a car can be regulated externally, which offers opportunities to greatly improve road safety. In busy traffic or bad weather, the speed of a stream of traffic can be adapted to the circumstances, without major enforcement problems.

Intelligent speed adaptation is one of the options available for making drivers slow down in residential areas. A trial has been conducted in the city of Tilburg, The Netherlands, with support from the European Union.

This trial has shown that ISA is technically feasible, and only relatively minor problems were encountered keeping the system operational. Up to 65 per cent of test drivers support the idea of ISA. Among reference groups outside the test area 30 per cent declared that they are opposed to the idea. For all groups the percentage of neutral drivers is around 20 per cent. Support for ISA is mainly based on the realisation that speeding in traffic is a problem in everyday life.
Support for ISA is highest if it is to be implemented in 30 and 50 km/h zones. Almost 66 per cent of car drivers support its implementation on streets of that kind. Support for its implementation on 80 km and other rural roads was much lower.

The main conclusion is that ISA does indeed have a considerable effect on driving behaviour. Average speeds are lower, in absolute terms and in speed variation. This is due to the fact that high speeds are cut off. ISA has a traffic calming effect, and therefore a positive effect on road traffic safety. This effect is confirmed by the test drivers who reported fewer overtaking moves and larger following distances.

Calculations based on the theoretical relationship between speed and traffic safety resulted in predictions of a 34 per cent reduction in fatal accidents and a 27 per cent reduction in injuries (as a result of widespread introduction of ISA in 30/50 km/h areas).

In Sweden small scale pilot projects with Intelligent Speed Adaptation (ISA) have been completed and four large scale pilots have now begun. ISA is one of the main elements in Sweden’s national road safety policy. In Sweden ISA is considered a voluntary system, unlike The Netherlands’ approach to ISA. British universities too, are carrying out contract research in the area of ISA. The view (expressed by the University of Leeds) is that in terms of organisation a mandatory system could only be introduced as a standard system in Europe in 20 years’ time.

Mandatory ISA will not be implemented in the near future. Public acceptance of such a measure is still too low. However, a number of car manufacturers already offer voluntary variations of ISA in some of their models. Over the next few years manufacturers and governments should work together to increase the market penetration and functionality of such voluntary systems. Further research is also required to establish the interaction and effect of these systems between equipped and non-equipped vehicles.

There is more faith in Advanced Driver Assistance (ADA) systems, and driver support systems such as Adaptive Cruise Control, Lane Departure Warning Assistant and Collision Avoidance Systems. In The Netherlands experiments are being conducted with the Lane Departure Warning Assistant (LDWA) for freight transport, the Autonomous Speed Assistant (ASA) and the External Speed Assistant (ESA).

When it comes to road safety, most accidents occur on urban arterial roads and 80 km/h roads outside built-up areas. Therefore, in The Netherlands there will also be more emphasis on improving road safety on the secondary road network using Adaptive Cruise Control, Lane Keeping, Intelligent Speed Adaptation and Interactive Green Waves.

The Dutch pilots studies should provide more information about the effects of these applications, public acceptance and whether they can be scaled up. In addition, these systems need to be more widely promoted to make people familiar with them.

**THE AUTONOMOUS SPEED ASSISTANT PILOT (ASA)**

The Autonomous Speed Assistant supports the driver when selecting a safe speed by giving information: on a screen, by means of an “active” electronically controlled accelerator or brake pedal or through a link to the Adaptive Cruise Control. ASA helps to increase road safety (partly by preventing dangerous situations) and reduce traffic jams caused by road accidents. A safe speed is determined on the basis of the road geometry (advisory speed on certain road sections or stretches), fixed speed limits and vehicle dynamics (including tilt
The main purpose of the ASA pilot is to obtain a clearer understanding of the effectiveness of the ASA system and of the subsystems which make up ASA. The pilot study will be aimed at professional road users in various target groups and will include at least 10 trucks, 5 delivery vans and 10 private cars. FIAT and BMW have already indicated their willingness to take part. The study will take place during 2003 and 2004.

THE EXTERNAL SPEED ASSISTANT (ESA)

The External Speed Assistant system is a speed advisory system. The speed information is obtained from sensors which communicate with the road infrastructure. The dynamic advisory speeds can be presented to the driver in various ways: by means of an active accelerator and brake pedal, on a screen or through a link to the pre-set speed of the Adaptive Cruise Control. Each of these options will be investigated. ESA will help to increase road safety on the motorways. Furthermore, because individual streams of traffic can be influenced, it offers good prospects for effective use of the main road network. ESA will also help to reduce congestion by reducing the number of road accidents. The main purpose of this ESA pilot study is to learn more about this technique and the consequences of its implementation.

The pilot will be carried out in normal commuter traffic and involve 5 private cars where information is presented on a display, 5 cars with an active accelerator pedal and 5 cars with a link to the ACC. The study will take place from 2005 to 2007.

Until recently, road safety was only a by-product of ITS (Intelligent Transport Systems) development and certainly not a central aspect of design. Today, there is sufficient evidence to suggest that the development and applications of ITS should not be left entirely to market forces, as the market does not necessarily select the alternative most beneficial to safety. Manufacturers should receive help in dealing with design, development, and implementation issues, in order to establish the correct balance between safety and other ITS objectives.

Another important consideration in technological innovation are the psychological aspects. For new technologies to be accepted, it is not enough simply to emphasize the benefits to society; the advantages for the individual road user must also be pointed out. Conversely, new technologies must not result in the driver being swamped with information, thus increasing the risk of manoeuvring errors.

SUPPORTED BY THE DUTCH GOVERNMENT

Speed is a key design parameter in a fault-tolerant traffic system and as such offers an effective means of reducing speed-related causalities. The government views its task as creating a good quality infrastructure. Part of this involves maintaining an average speed of 60 km/h on the main highways in peak periods. On many stretches of motorway, particularly in The Netherlands’ main western conurbation, this has not yet been achieved. Studies are underway to increase speeds in those areas where they seem likely to permanently remain below 60 km/h.

Further research in this area is necessary to obtain a better understanding of the likely behavioural responses to different levels of technological intervention. Therefore, the Dutch government is supporting further experiments.
~ Through experiments, the government is giving an impetus to the development of Advanced Driver Assistance (ADA) systems. ADA is an umbrella term for various forms of intelligent speed adaptation and lane departure warning systems. Large-scale tests will be carried out from 2003.

~ The government is setting up a schedule for the development of Automatic Vehicle Guidance (AVG) over the next few years. This is being done in co-operation with the private sector, specifically to improve road safety and road utilization. The intention is to follow international developments and to create the necessary legal frameworks.

The government has further resolved to undertake the following:

~ The government will start a trial with a speed limiter in light trucks and vans. This will be done in co-operation with the private sector. After the trial, based on the results, the government will work to amend the European legislation in this context.

~ The government will give an impetus to the introduction of Intelligent Speed Adaptation (ISA). Following the first, successful trial in a residential neighbourhood in Tilburg, large-scale trials are planned.

~ The government will support the development and introduction of the on-board computer and the driving behaviour data recorder (black box). The accent will be placed on the commercial market, and freight transport in particular, for the purpose of gaining logistic advantages and contributing to safer driving (especially in relation to speed). A pilot study is being prepared.

It is clear from the current situation that we need to establish a long-term strategy on ITS with a view to road safety (ETSC and SWOV). The strategy also needs to include how these organisations can develop their role in giving advice to industry with regard to the design, development, implementation and evaluation of new products. It is important to ensure that the potential benefits to the community are maximised and that any disadvantages are minimised.

Priority should be given to the development of ITS that addresses identified road safety problems, rather than promoting technologies for their own sake. General aims other than safety are, of course, legitimate as long as safety is not hampered.

The implementation of ITS-related technology must take place in a co-ordinated and integrated fashion.

The current limits also need to be looked at more carefully. People are driving too fast on a massive scale which raises the question of whether road users really understand why a certain limit is in force.

On a sustainably safe road network the limits should match the road picture in a logical fashion. This is not always the case. The system of speed limits is fairly rigid. Limits which can be adapted to driving and weather conditions would be more credible and therefore more closely observed.

Where the road infrastructure does not enforce the required speed limit, other measures will be needed. In the short term enforcement will be carried out by the police, but at the same time technological solutions could also be investigated.

The Netherlands is opting for quality: quality of human life and the quality of the environment. We may have mobility, but we must also have road safety!
REFERENCES


