GOVERNMENT STATUS REPORT FROM THE NETHERLANDS

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1. THE DUTCH ROAD SAFETY SITUATION

After several years working now with the concept of Sustainable Safety the Netherlands have since ESV 2001 now succeeded for the first time in reducing the number of traffic fatalities under 1000 on an annual basis. This is the same level of traffic fatalities as in 1950: long before the mass-motorisation in the Netherlands took place.

In the Netherlands the ambition regarding safety is to achieve continuous improvement. The strategy developed to accomplish this is called Sustainable Safety. The most essential of Sustainable Safety is that it tries to design the traffic system in such a way that human error is avoided. Accident research clearly indicates that up to 90% of all accidents is caused by human errors. If the components of the traffic system (infrastructure, vehicles) can be designed in such a way that safe behaviour is the natural choice for people in traffic, many accidents may be avoided. For this reason great investments ave been made to improve the safety of local and regional roads into 30 and 60 km/h zones and other types of self-explaining roads.

After the general elections earlier this year preparations are now ongoing to set new safety targets for 2010 and 2015. To maintain the level of progress new initiatives are required. Within the concept of Sustainable Safety the system approach will in the future also focus more on the capabilities of vehicles to contribute to road safety. A first step in this direction was made by the publication of a policy paper with the Dutch perspective on Automated Vehicle Guidance in 2002.

2. PARTICIPATION IN INTERNATIONAL RESEARCH

The Netherlands are participating in the following European projects:

- EEVC working groups – 12, 13, 14, 15, 16, 17, 18, 19 and 20.
- EU projects – ADASE, HASTE, PROSPER, RESPONSE 2, ROSETTA.
- Ertico activities – Speed Alert, Electronic Car Identification

3. IMPROVING THE SAFETY OF VEHICLES

3.1. Maintaining the quality of the existing fleet

An instrument to control the quality of the existing fleet is periodical inspection. Since the introduction of periodical technical inspections in the 1980's several improvements have been introduced. An evaluation study on periodical inspections has just been started. The report will be presented to Parliament in the beginning of 2004.

The registration of vehicles is important in order to enforce compliance with existing legislative requirements. At this moment such a registration does not yet exist for all vehicle categories in the Netherlands. In 2002 it has been introduced for trailers. In 2003 –2004 license plates will be introduced for mopeds and agricultural tractors.
Concerning licensing, the use of new technologies is also stimulated. The Netherlands will participate in a European Union project that aims at the introduction of an electronic car identification (ECI). The introduction of ECI will prevent fraud with license plates and create new opportunities for storage and dissemination of car related information.

3.2. Improving the quality of vehicles

In the passed years, annually large numbers of pedestrians and cyclists were killed by trucks taking a corner. An important explanation for this was that truck drivers were still having a blind spot in spite of the mandatory rear view mirrors. In the passed two years a subsidy was given to transport companies to equip their vehicles with systems to overcome this problem . Starting 2003, these systems have become mandatory for trucks with a Dutch registration. The European Union is working on a directive to make it mandatory for all member states.

4. THE PERSPECTIVE ON ADVANCED VEHICLE TECHNOLOGIES

4.1. The national policy paper of 2002

Important driving force for putting effort in Automated Vehicle Guidance is the expected contribution of these intelligent systems in the improvement of traffic safety, but also for reducing congestion and to a lesser extent reducing environmental problems of road traffic.

In the paper some opportunities for the deployment of fully automated vehicles are identified in well controlled situations, such as containerterminals and on dedicated lanes for public transport. A roadmap for Fully Automated Vehicles is under development and will be finished in the beginning of next year. The major focus however is on Advanced Driver Assistance Systems where the objective is to keep the driver in the loop.

Development of Advanced Driver Assistance Systems is lead by the automotive industry, it is within the industry that the necessary technological capabilities are available. The aim for the Dutch government is trying to be complementary to this. In this respect the following roles are identified: development of a vision concerning Advanced Driver Assistance Systems, stimulator, legislator and road authority.

Creating a vision concerning the deployment of Advanced Driver Assistance Systems together with industry can help to set a common goal. Also it will give insight on the areas where industry can expect active support from the authorities. A major point of reference for the Dutch situation has been the developments as elaborated in the Advanced Driver Assistance Systems-roadmap. In the Netherlands the focus in the national vision is in particular on speed and lateral support. From the technologies that contribute to driver performance in those area's, the highest benefits for safety and throughput are expected. For instance: the Dutch Institute for Road Safety Research SWOV has indicated that if 90% of all drivers would drive in compliance with current speed limits on roads outside built-up areas alone, already 200 fatalities could be prevented. Certainly for the 10-15 years to come available systems will be driver support systems, so the driver will stay in the loop.

Too often the focus with intelligent systems in cars is on the distant future. Automated Vehicle Guidance is often seen as a kind of Jules Verne story: it may become reality some time but probably for future generations. For the average consumer but also often for politicians this is not very appealing: their perspective is more short term. In order to make society benefit from Advanced Driver Assistance Systems technologies as soon as possible, but also to maintain attention from consumers and politicians, the Dutch policy regarding Automated Vehicle Guidance is focussing on those elements of Advanced Driver Assistance Systems that are now already for sale at car dealers or that will be on the marketplace at latest approximately five years from now.

Stimulating the deployment of technology that is now on the market is done by giving fiscal incentives to in-car systems that contribute in particular to safety or the environment. These systems need to be Original Equipment Manufacturer-equipment on new cars and fit as building blocks in the national strategy for Advanced Driver Assistance Systems. Every year a list of car accessories is published that will receive the tax benefit: an exemption of the 40% tax on new cars. The list for 2002 contains amongst others navigation systems and cruise control.
The role as a stimulator is also fulfilled by identifying near to market technologies that may be the subject of Field Operational Tests. The objective is to see which technologies provided by industry can help to solve which transport problems and what are their benefits for society. In addition to that the Field Operational Tests can help to create awareness and support for functionalities developed by industry. In the end the co-operation of authorities and industry in Field Operational Tests may result in finding launching customers for new automotive products. The current executed LDWA-Field Operational Test in the Netherlands is an example for this approach.

The role as legislator is focussing on the establishment of a legal framework that at least allows the deployment of Advanced Driver Assistance Systems, but where possible actively

supports the application of those systems. Major issues under consideration are of course liability and human-machine-interface. The Netherlands are participating in European activities for finding solutions to these questions. Issues at the national level are the creation of legal instruments that facilitate experimental activities like Field Operational Tests. Also under consideration are the possible implications of the introduction of intelligent in-car systems for the driver education and perhaps even the driver licensing requirements.

The Dutch Ministry of Transport also is acting as the road authority for the motorway network in the Netherlands. In this respect the participation in Field Operational Tests is important in order to be able to anticipate on the possible requirements for infrastructure that may be necessary for the introduction of Advanced Driver Assistance Systems. The reverse is also the case, tests together with industry can for instance give information concerning the feasibility to raise the capacity of motorways by temporary increasing the number of lanes during rush hour.

In the Automated Vehicle Guidance policy paper several Field Operational Tests are announced, these are focussing on lane keeping and on speed. In the next paragraphs the ongoing and proposed activities will be explained.

4.2. Lane Departure Warning Assistant

The Lane Departure Warning Assistant (LDWA) system warns the driver if he is in danger of leaving his lane unintentionally. Target groups are long-distance coaches, freight trucks and delivery vans. The focus is generally on professional drivers clocking long distances.
The system is available on the market in various forms. Opinions on the effectiveness of the system are various. LDWA may contribute to increasing traffic safety and reducing traffic jams resulting from major accidents (caused by heavy road users). The primary goal of the LDWA pilot is to obtain insight into the benefits and risks of the system to be able to develop effective policy related to deployment of LDWA. Research questions are: what are the effects, how is the user acceptance and how is the system perceived, what may be the consequences for infrastructure operators, and how LDWA can fit into a long term strategy (i.e. compact driving). A fleet of 50 vehicles (trucks and buses) has been equipped. In the course of 2003 a decision will be taken how to proceed with the possible deployment of this functionality in the Dutch market.

4.3. Autonomous Speed Assistant (ASA) Pilot Field Operational Test

The Autonomous Speed Assistant system aids the driver in selecting a safe speed at the right place and moment by providing information: auditory, visual or through an electronically operated "active" (haptic) gas pedal or brake pedal, or via a link with the Adaptive Cruise Control (ACC). A variety of user-interfaces should be tested and evaluated. The idea is that ASA contributes to increasing traffic safety by preventing dangerous speeds and situations and reducing congestion resulting from accidents.
Safe speed is determined on the basis of road typology, fixed speed limits and vehicle dynamics (including rollover warning systems) and the distance to other vehicles. The primary goal of the ASA pilot is to obtain insight into the effectiveness, user acceptance, and infrastructure consequences that the independent systems may lead to. Strength & weakness analyses could lead to effective policy making.
The pilot study is focused on the professional user in various target groups and the pilot proposal involves at least 10 trucks, 5 light commercial vehicles and 10 passenger cars.

The ASA system is primarily intended to increase safety on the main and secondary road networks. ASA may contribute to reducing accidents related to the following situations (these account for approximately 50% of all fatal and serious injury accidents and 75% of all serious injuries outside urban areas in the Netherlands).

- excessive speed;
- insufficient following distance (prevented by the ACC, keeping a safe distance);
- loss of vehicle stability (vehicle dynamics, rollover stability);
- dangerous curves (including under poor visibility);
- dangerous intersections (including right-leading right-of-way).

According to the plan, the pilot will be performed in 2004-2005, and should be completed by the beginning of 2005. Currently a pre-ASA study is being done. This study is intended to further specify the design for Field Operational Tests.

4.4. External Speed Assistant pilot (ESA)

The External Speed Assistant system is a dynamic speed management system. The system receive its speed data through sensors communicating with the infrastructure. The dynamic recommended speeds are transmitted to the driver through several variants that have to be investigated:

visual/auditory, a haptic throttle and brake pedal, through a link with the speed setting of the Adaptive Cruise Control (Extended ACC). ESA is expected to contribute to increasing traffic safety of the primary road network. Furthermore it offers the ability to affect traffic flows actively at the individual level. Thus, expected travel time may become more reliable. Besides this, ESA may contribute to reducing traffic jams by reducing the number of accidents. Internationally, various committees are actively involved with ESA variants and various demonstration projects are planned. The primary goal of the ESA pilot is to gain experience with this technology and the consequences of its implementation, such as the necessary organization of road authorities.
The pilot proposal is focused on commuter traffic and will involve at least 5 passenger vehicles with on-screen information, 5 passenger vehicles with active gas pedals and 5 passenger vehicles linked to ACC. According to the plan, the test site will be operational from 2005 to 2007. A potential bottleneck could be liability-related.

A start has been made with the execution of a pre-ESA activity. The outcome of this study will be a specification of the design for the ESA-trial. A final go/no-go decision moment will be scheduled in the course of 2003.

Important driving force for putting effort in Automated Vehicle Guidance is the expected contribution of these intelligent systems in the improvement of traffic safety, for reducing congestion and to a lesser extent reducing environmental problems of road traffic.

4.5. Fully automated vehicles

In the paper some opportunities for the deployment of fully automated vehicles are identified in well-controlled situations, such as container terminals and on dedicated lanes for public transport. Within this framework a semi-automated bus (Phileas) has entered in operational service in the city of Eindhoven. This bus is equipped with precision-docking technologies. Due to legal provisions, a driver still is present.
In addition to the already existing ADASE-roadmap, a roadmap for Fully Automated Vehicles is under development and will be finished in 2003. Further a project has been started to elaborate a set of criteria and rules that can be used for the approval of fully automated vehicles to (public) roads. These activities should facilitate the deployment of a new generation of people movers as scheduled for the next years.

4.6. Other activities

There is an increasing amount of information coming available for the driver. The objectives of the information may differ: from improving the operational driving task to providing leisure for the driver. For the year 2004-2005 a pilot is scheduled that aims to present, to the driver in the vehicle, the relevant information that nowadays is presented by signs etc. along the road. The benefit may be to give the driver relevant, tailor-made information during travels.