

Research Activities is published three times a year by SWOV Institute for Road Safety Research in the Netherlands.

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Photo: Harvey Chartrand (CCMTA)

## Professor Fred Wegman: inspiring the new generation about road safety

**One day a week, SWOV's Managing-Director Fred Wegman leaves his office in Leidschendam to spend his time with the students of Delft University of Technology (TUDelft): recently he has been appointed Professor of Traffic Safety. "It takes some getting used to" says Wegman. "A university is a completely different world from a research institute." He has already clearly outlined his spearheads. Improving the infrastructure's road safety features is one of them. The new professor also intends making road safety an important issue in decision-making about roads and traffic.**

Fred Wegman is no unknown to TUDelft. He studied there himself and has been a lecturer at the university for the past decade. "I teach the subject Traffic Safety and am therefore familiar with the

Department of Civil Engineering which took the initiative for the Chair of Traffic Safety".

### Scientific profile

Meeting all the requirements for the professorate was not the only reason for Wegman to apply. "I have found that teaching and discussing the subject with students gives me much pleasure and

*Continued on page 2*

**"The real enigma in traffic psychology is the relation between behaviour and accidents."**

In memory of Talib Rothengatter  
Professor of Traffic Psychology,  
University of Groningen

QUOTE

### Editorial

The opening article in this issue of Research Activities is the interview with SWOV director Fred Wegman about his appointment as Professor of Traffic Safety at Delft University of Technology.

inspiration", he says "In addition I find the professorate a good opportunity to strengthen the relation between road safety and science. In my ten years as SWOV's managing director, we strengthened this relation. It is very pleasing to observe that the higher scientific profile of SWOV has also been recognized in the academic environment. I therefore consider my appointment as a reward for the entire institute. I hope that my professorate will further strengthen the relation, and even more important, can inspire the students."

### Interpretation

Initially Wegman will be engrossed in his interpretation of the professorate. "It can be described as an almost empty room which I can completely furnish myself. I can choose myself how to fill in the Chair. I am self-employed, really. In any case, two things are at the top of my list. I want to improve the knowledge about the infrastructure's road safety features and I will try to achieve that road safety is part and parcel of decision-making." Taking opportunities, creating possibilities, and creating an interest for road safety with the new generation are the core of his professorate.

### International cooperation

Already it is clear that Wegman does not limit his field of activity to the Netherlands. He absolutely wishes to seek for international cooperation. "Research into safe infrastructure is a complicated matter" he says. Especially finding solid data is a problem. In the Netherlands SWOV really is the only institute that investigates this issue. In other countries there are some ten to twenty institutes or universities that do research into the infrastructure's road safety. It would be advisable if we could join forces." According to Wegman there is a strong need for more research in this field in the Netherlands: "At present, our country lacks a good framework that can supply safer road design with a scientific foundation. The Netherlands can really do with and I look forward to making a contribution. Our Sustainable Safety vision already acts as a solid basis."

### Guidelines for road design

In relation with this subject Wegman mentions the Highway Capacity Manual which was developed in the United States decades ago. Also in the Netherlands this manual was a source of inspiration for the guidelines for road design. In the United States, however, it has been concluded

that applying this manual does not result in safer roads. Later this year, the Highway Safety Manual will be published in the United States. The book is based on thorough research and Wegman's expectations are high. "We really should consider the possibilities for such a project in the Netherlands", says Wegman. But perhaps our country is too small and we should seek cooperation with other countries" The Sustainable Safety vision is mentioned in connection with this topic: "It is a leading vision worldwide" says Wegman. „But the Sustainable Safety principles still need to find their way into guidelines for road design, and this requires more research."

### Opportunity

Wegman is pleased that Traffic Safety is a compulsory subject for students taking the master Transport & Planning. "I have worked in this field for 30 years now and during all these years I have been using knowledge as a tool to improve road safety. I consider it a great opportunity that as a professor I can convey this knowledge to a new generation, both at the university and in SWOV. An additional reward is that road safety is a very exciting subject. There is always something new, something different. Not only in the Netherlands, but all over the world." ◀▶

## Traffic signs: their use and necessity

### A discussion has been started in the Netherlands about whether road traffic would not benefit from (far) fewer traffic signs. Primarily, this discussion concerns the non-mandatory traffic signs.

Traffic signs are mainly intended to inform road users about how they are expected to behave and to warn them of possible hazards. It is often wondered if there is an excess of signs at certain locations. This could have a confusing effect on drivers. A subsequent question is to what extent safety would be threatened if part of the signs or all the signs would be removed.

Research indicates that a driver spontaneously notices only 10 to 20% of the traffic signs he passes. This suggests that traffic signs only make a small direct contribution to road safety. However, signs remain necessary for road safety – at least for important traffic rules like speed limits, indication of access or no access, driving direction, position on the road, and priority. These rules are so crucial for the prevention of dangerous situations that all must be done to convey their particular message to all road users.

### Too many signs

At present traffic signs and road markings are important aids. However, if too many traffic signs are placed at a certain location, the signs that must really be noticed are not conspicuous any

longer. Reorganization of those situations and hence removal of the superfluous signs is then desirable. Furthermore, the distinction between important signs and less important signs could be improved by, for example, varying their conspicuity.

### Further study

In the Netherlands, the first step must be to inves-

tigate to what extent there is an excess of traffic signs. Also it should be determined in the occurrence of how many and which types of crashes this plays a role. It is also necessary to investigate whether and under which circumstances traffic signs could be removed. SWOV advises against making adjustments without further previous investigation, because this may lead to more crashes and casualties. ◀▶



# Road safety knowledge and policy making: good communication a prerequisite

**A SWOV study indicates that good, clear communication between researchers and policymakers about expectations, wishes, possibilities, and limitations of research can stimulate road safety knowledge being used in policy making. This could make a contribution to the decrease of the number of traffic casualties.**

Scientific knowledge about road safety is not always used by policymakers. SWOV carried out a study to find the reasons for the usage and non-usage of knowledge.

## Use of knowledge

Interviews with policymakers and road designers in twelve provinces were conducted to investigate which information is used for the construction of infrastructural road safety measures on provincial 80km/h roads, and how the information is used. It is often the case that provinces construct measures of which the effects, and, to a lesser extent, the costs are unknown. Approximately half of the interviewees say to have an idea of the costs and effects of road safety measures on 80km/h roads. They have a clearer picture of the costs than of the effects. Two thirds of the interviewees indicate that cost-benefit information somehow plays a role in the decision-making, also if there is no clear picture of the costs and the effects.

Most provinces take their knowledge about the effects of measures from their own crash studies. Knowledge from outside the own organization is used to a much lesser extent. According to the interviewees, one of the reasons for this is the fact that scientific knowledge does not meet their knowledge requirements. Other reasons are that it is not in line with provincial policy, the poor applicability of the scientific knowledge under prevailing conditions, and the political delicacy of some of the topics.

## Data, ideas, ammunition

Study of different theories indicates that research is rarely used directly in policy making. Knowledge from scientific research can be used in three different ways: as a provider of data, as a provider of ideas, or as a provider of ammunition.

As a provider of data, science supplies research data which is used by policymakers in making concrete, often small-scale decisions. This type of knowledge use mainly serves the purpose of supporting plans that policymakers have already developed.

As a provider of ideas, knowledge can have an effect on the policy agenda, and help solving yet unsolved policy problems. The introduction of the Sustainable Safety vision is an example.

As a provider of ammunition, knowledge from sci-



entific research is used by policymakers to validate their own point of view and convince others.

## Interfering factors

Scientists who study the wide field of knowledge use often blame non-use of knowledge on the differences in the cultures of science and policy. There are several factors which can hamper the use of knowledge by policymakers. Possible obstructions, for example, are the quality of the research, the accessibility of the results, and the attitude and need of the knowledge user. Furthermore, the knowledge should match the type of problem the policymaker finds himself confronted with: for structured problems knowledge is used in a routine manner, for ill-structured problems knowledge can be used as part of the political game. Finally, the nature of the policy making process itself can have an influence on the use of knowledge. Examples are the centrality of the decision making, the number of parties involved, and the political delicacy.

## Communication

Scientific knowledge not always being used is partly due to the fact that policy and science are different worlds. Therefore it is advisable for both policymakers and researchers to have clear com-

munication about the expectations, wishes, possibilities and limitations concerning research. Subjects that must be well attuned between researcher and policymaker could be the problem the research needs to solve, the manner in which the results will be used and the appropriate presentation methods, the precise time at which the results must be available, and the consequences a delay will have on policy making. Furthermore, arrangements must be made about some sort of quality control, especially in cases where it is difficult for the party who commissioned the research to check its quality. The quality control could for example be carried out by an external expert or committee. Finally, it is important to agree on how the commissioning party should be involved in the research so that it has the possibility to adjust the course that is taken. ◀▶

*The fact sheet 'Use of road safety knowledge by policy makers' is in English and gives more information about this subject. The interview study has been published in SWOV report R-2008-13 'Use of information in decision-making about road safety measures; Study in twelve Dutch provinces'. The report is in Dutch, but has an English summary. Both publications can be found on SWOV's website [www.swov.nl](http://www.swov.nl).*

# Dynamic speed limit trials on motorways

**Mid-January 2009, the Dutch Minister of Transport Eurlings gave the green light for dynamic speed limit trials on motorways. SWOV is in favour of dynamic limits. Dynamic limits make it possible to adjust speed limits to the current traffic conditions like the amount of traffic and the weather conditions. Hence, dynamic speed limits are expected to be more credible than static limits, and, consequently, this also makes a dynamic speed limit system safer.**

The dynamic speed limit trials will be carried out at four motorway sections. This will not only be done for safety reasons, but also to improve the traffic flow and the air quality. At some road sections the speed limit will be raised when conditions are favourable, at other sections the speed limit will be lowered under unfavourable conditions. The speed limit, however, will never be higher than the maximum limit in the Netherlands

of 120 km/h. The trials will be held under different conditions on different road sections. The trials are expected to continue for two years. SWOV recommends that trials with dynamic speed limit systems should also be carried out on road types other than motorways.

## **Credible limit, better compliance**

Many road traffic casualties can be saved if road users keep to the current (safe) speed limit. Infrastructural measures and speed enforcement are important tools to achieve this. However, it is not feasible to place physical speed limiters or cameras at every thinkable location. SWOV has frequently indicated having high expectations of 'credible speed limits' as an additional measure. All too often a speed limit does not correspond with the traffic and road image and is not credible for many road users. An incredible limit not only affects the speed behaviour on that particular road, it could also be responsible for undermining the credibility of speed limits in general and, con-

sequently, their compliance. Of course credibility is subordinate to safety.

## **Road features determine credibility**

At present most speed limits still are static limits whose credibility is determined by the road's static features. Several SWOV studies have shown that specific static features of the road and its environment affect the credibility of a limit; examples are the road width, its curviness, and the 'openness' of the environment. Drivers appear to agree largely on the features that determine the credibility. Therefore, it is possible to make limits more credible by tailoring the road features to the desired, safe speed behaviour and the matching limit. Based on this principle, SWOV, together with some regional partners, is presently developing a decision support system for road authorities.

## **Dynamic limits always and everywhere**

According to SWOV it should be investigated if an entirely dynamic speed limit system could be achieved in the Netherlands; not only on motorways, but also on the secondary road network. This can be realized by in-vehicle indication of the speed limit in force at that particular location and at that particular moment. Not only are several technical developments required before this can be achieved, some crucial questions as regards this topic need to be answered as well. One of the most important of these questions is which speed limits under which conditions must be used to achieve an acceptable safety level. Another question is how frequently a limit can be adjusted. Acquiring this knowledge is an important challenge for road safety research in years to come.

*The fact sheets 'Measures for speed management' and 'Towards credible speed limits' give more detailed information about this subject. Both fact sheets are in English. SWOV report R-2004-12 entitled 'Safe and credible speed limits' is in Dutch, but has an English summary.*



## Possible standstill in road safety improvement in the Netherlands

**The number of road deaths in the Netherlands has shown a downward trend during the past decades. A remarkable and sudden decrease occurred in 2004. In the years 2005, 2006 and 2007 the number of fatalities continued to go down slightly to reach 791 in 2007. After a positive period 2000-2006, however, the most recent data on alcohol use, seatbelt use, red light running, and driving speed show no further improvement in 2007.**

Based on information from the Dutch Bureau Traffic Enforcement SWOV has come to the conclusion that in 2007 police enforcement has not increased as it did in previous years, but maybe has even been reduced. SWOV assumes a relation with the less positive development of traffic behaviour. Only the enforcement of drink-driving did increase in 2007. These are SWOV's observations in report R-2008-12 *Road safety in 2007: is a standstill a step backwards?* which was published late 2008. SWOV makes these observations to

draw the attention to a possible standstill in road safety improvement. Furthermore, the report contains a hoard of data about numbers of fatalities, risks for different transport modes and age groups, and traffic behaviours.

## **Fatality rate and behaviour**

In 2005, 2006 and 2007 the fatality rate continued to decrease, especially among car occupants. The fatality rate for pedestrians, (slow) moped riders and motorcyclists in 2007 was

somewhat higher than in previous years. No exact explanation of these developments can be given, but they are the result of changes in for example mobility, traffic behaviour, vehicle safety, infrastructural safety, enforcement and other factors. However, if we look at certain types of behaviour that are relevant for road safety, we cannot observe a continuation of the improvement in previous years. This is the case for drink-driving, seatbelt use, red light running, and driving speed at certain road types.

### Extra efforts

The relatively positive development of the number of fatalities since 2004 has prompted the lowering of the policy target from 580 fatalities to a maximum of 500 fatalities in 2020. Additional measures are required to reach this more ambitious target. The Dutch Ministry of Transport's Strategic Road Safety Plan 2008-2020, offers several handles that can be used for this purpose.

### Infrastructure and enforcement

SWOV report R-2008-12 *Road safety in 2007: is a standstill a step backwards?* also contains recommendations in which the infrastructure improvements and better enforcement play an important role. For infrastructure, lack of the required information has unfortunately made it impos-



sible as yet to determine to what extent investments have contributed to the road safety developments. SWOV emphasizes the importance of reliable information here and supports the Minister of Transport's intention to monitor the effects of measures. Concerning enforcement SWOV recommends to at least maintain the present level

and to make efforts to improve effectiveness and efficiency. ◀▶

SWOV report R-2008-12 'Road safety in 2007: is a standstill a step backwards?' can be found at [www.swov.nl](http://www.swov.nl) under Publications. The report is in Dutch, but contains an English summary.

## Accompanied driving for 17-year-olds



**Dutch Parliament has approved an accompanied driving trial. The trial will probably start in 2010 and will have a duration of a maximum of six years.**

In the accompanied driving trial youths will be allowed to take driving lessons when they are 16.5 years old and take the driving test at the age of

17. When the test has been passed successfully, they can only drive accompanied by an experienced driver until they reach the age of 18.

### Driving experience

Young, novice drivers are relatively often involved in crashes. For each kilometre driven their risk of having a serious crash is more than four times

higher than that of experienced drivers; for male young novice drivers the risk is even six times higher. Accompanied driving ensures that young novice drivers have more driving experience when they start driving independently. Therefore, SWOV is in favour of accompanied driving and estimates that the introduction of an accompanied driving system will save approximately 15 fatalities per year. Of course, a thorough assessment must be made to determine the precise effect of accompanied driving on road safety in the Netherlands.

### Graduated license

SWOV sees accompanied driving as a first step towards a so-called graduated driving license. A graduated license allows novice drivers to gradually drive under more complex conditions (e.g. driving at night or with passengers in the same age group) as they gain more experience. International research indicates that these restrictions can further reduce the number of crashes involving young, novice drivers. ◀▶

*The fact sheets 'Accompanied driving' and 'The graduated driving license' contain more information about this topic. Both fact sheets can be found on [www.swov.nl](http://www.swov.nl).*

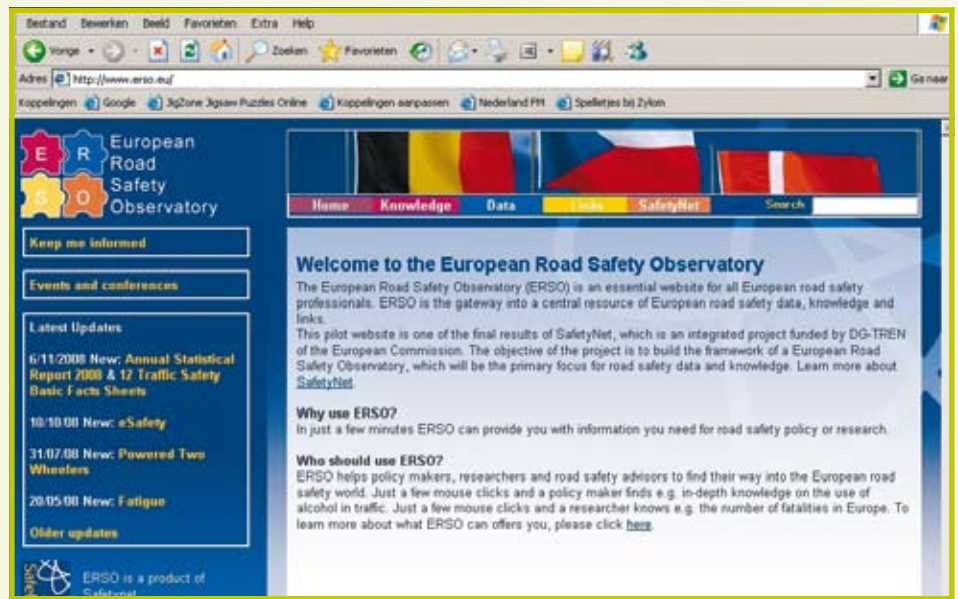
# SafetyNet: a successful European project

**The EU project SafetyNet, which was completed in November 2008, was assessed as a good to excellent project in the review report that was drawn up by three external reviewers.**

SafetyNet was coordinated by the University of Loughborough; 22 institutes cooperated in 7 workpackages. SWOV was responsible for the workpackages on road safety performance indicators and the ERSO website, but also made important contributions to the other five workpackages in this project.

## Achievements

The SafetyNet project was started to assemble a coordinated set of data resources and information network that would meet the EC needs for policy support. The foundations were laid of the European Road Safety Observatory which will enable the Commission to monitor progress towards targets, identify best practises, and ensure that new regulatory and other safety actions will result in the maximum casualty reduction. Important components of the Observatory were developed and other components will still be added in future years. The Observatory contains information on all aspects of road and vehicle safety policy development at European and national levels. SafetyNet has made new proposals for common European approaches in several areas, including Safety Performance Indicators and independent and trans-



parent accident investigation. It has extended the CARE database to incorporate the new EU Member States and has developed new fatal and in-depth accident causation databases. It has also developed new statistical methods that can be used to analyse combined macroscopic and other data. All data assembled or gathered within the project are made available via the ERSO website ([www.erso.nl](http://www.erso.nl)) to the entire road safety community.

## Review

The reviewers concluded that the SafetyNet

project achieved all its objectives and made the following recommendation: "The potential of the ERSO website is reflected in the increasing number of visitors worldwide. It is vital that this website is maintained and updated, because it is the best source of road safety information in the whole EU." ◆◆

*In addition to information for road safety policy or research, the ERSO website [www.erso.nl](http://www.erso.nl) also gives an overview of all the SafetyNet activities.*

## Increasing mass differences between passenger cars have a negative influence on road safety

**In the specific crash type 'collision between two passenger cars', 25% of the fatalities among drivers could be prevented if differences in car mass are eliminated. This is the main conclusion in a SWOV study of the effect of vehicle mass on the injury or death rate in crashes between two passenger cars.**

According to biomechanics, the difference between the vehicle masses affects the risk of injury and the injury severity in a crash between two vehicles. Therefore, the SWOV study investigated the effect of differences in vehicle mass. The study mainly used data from the Dutch database of registered crashes. Since 2001, this data has included information about the vehicles that are involved, also about their mass.

## Increasing mass, increasing differences

Since 1999, the Dutch vehicle fleet's average

mass has been increasing by 15 kg per year. The differences in mass also increase every year. This is the result of existing passenger car models increasingly becoming heavier, while new, light models are being introduced in the light vehicle segment of the fleet. Furthermore, there is also the ascendancy of extra large and extra heavy passenger vehicles like SUVs and MPVs. Hence, the mass differences between vehicles are increasingly becoming larger.

## Measures

The SWOV study has quantitatively determined the effect of the differences in vehicle mass on the injury rate and the injury severity in crashes involving two passenger cars. This required determining the absolute injury rate as a function of the relative mass difference. The absolute injury rate is the risk of injury, given a crash between two vehicles with a given relative mass difference. The relative mass difference is the mass difference divided by the sum of

the masses. This measure for the differences in vehicle mass between the two vehicles that are involved in one crash has proven to be very useful in the present study. The absolute injury rate was determined for three levels of injury severity: death, in-patient, and minor injuries.

## Larger differences, more fatalities

Earlier studies have shown that vehicle mass has not only an influence on the risk of a driver of a passenger car, but also on the driver of another passenger car (or another road user in collision with a car). Greater dispersion in mass results in more fatalities. If all passenger cars were to have equal masses, the fatalities among drivers in crashes involving two passenger vehicles would decline by a quarter. Using the 2006 data for the Netherlands, there would have been 10 fewer fatalities among drivers in collisions between two passenger cars. In addition, there would also have been fewer fatalities among the car passengers.

## Example

Drivers of light vehicles have an increased injury and fatality rate when they collide with a heavier car. This means that they run a higher risk of injury or fatal injury in a crash involving a heavier opponent. The fatality rate of a driver in a light car (approx. 800 kg) who crashes with a vehicle of average mass (1.080 kg) is twice as high as that of a driver in a car with an average mass who crashes with another average-mass car. At the same time, the possibility that the light car inflicts fatal injury on the driver of the other vehicle, is only half that of the average fatality rate. The differences in injury rate, both for in-patients and for slight injury, are much smaller, because these rates are not as strongly determined by the relative mass difference.

## Recommendations

Road safety policy does not influence the weight of passenger cars. What could be done, how-

ever, is to reduce the incompatibility in collisions between passenger cars. Given the mass differences, this would limit the severity of the collision's consequences. On a European level this is a subject for research and policy. One example is to come to a better proportion of the bumper height and the vehicle design.

The vehicle structure must be adapted in such a way that it can absorb the difference in mass: this involves making large, heavy vehicles less rigid. ◀▶

*SWOV report R-2009-5 'The effect of vehicle mass on the risk of injury in crashes between two passenger vehicles' can be consulted on [www.swov.nl](http://www.swov.nl). The report is in Dutch, but has an English summary.*

Absolute injury rate	=	$\frac{\text{number of times that a driver is injured}}{\text{number of times drivers are involved in a crash}}$
Relative mass difference (Difference in vehicle mass between the two vehicles involved in one crash)	=	$\frac{\text{mass difference}}{\text{sum of masses}}$

# SWOV starts pilot in-depth study road traffic crashes

**In 2009, SWOV is working on a three-year pilot in-depth study of road traffic crashes. The pilot is meant to investigate the added value of this type of research for increasing road safety knowledge and supporting road safety policy. The Ministry of Transport has provided SWOV with an extra grant to carry out this pilot study.**

SWOV's in-depth team will be operational in the middle of 2009. The first months of the pilot are being used to set up the organization and to make the necessary arrangements with incident rooms, police, ambulance services and hospitals.

## Specific crash types

An important characteristic of the SWOV in-depth study is that it will actually consist of several studies, each of them aimed at a specific type of crash with a strong emphasis on human behaviour. For each of these crash types, a multidisciplinary research team will investigate which factors have contributed to a crash occurring and its outcome. The course of the crash process will be investigated thoroughly: which road users were involved in the crash, where did they come from,

where were they going to, what did they observe and how did they react, how did others respond, and what was the role of the vehicles and the road environment.

## Use of information

The information that is obtained will then be used to investigate where and at which point in time things started going wrong, why they went wrong, how this can be prevented in future, and how the severity of the outcome can be limited. This will provide leads for which measures can be taken to prevent future similar crashes or to reduce the injury severity of that specific crash type.

## Based on experiences abroad

In setting up the in-depth pilot, we carefully looked at the experiences abroad. For this reason, SWOV's project leader Ragnhild Davidse visited Loughborough University in the UK, INRETS Salon-de-Provence in France and the Road Traffic Accident Investigation Board (HVVU) in Denmark and discussed the pros and cons of the various approaches. ◀▶

## Colophon

Research Activities is published three times a year by SWOV, Institute for Road Safety Research in the Netherlands. Research Activities contains articles about road safety research and scientific projects carried out by SWOV and by others.

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The SWOV website contains a wealth of information about a variety of road safety topics. SWOV fact sheets are all available in English. The library has extensive possibilities to search for international road safety literature and publications.

# Fact sheets

**Three new fact sheets have recently been published about road safety topics that deserve extra attention.**

## **Use of road safety knowledge by policy makers**

The fact sheet *Use of road safety knowledge by policy makers* looks at the definition of the terms 'knowledge' and 'knowledge use' and discusses the ways in which knowledge is used. The fact sheet goes into the different factors that positively or negatively affect the use of knowledge in the policy making process. The article *Road safety knowledge and policymaking on page 3* gives more information about the study on which this fact sheet is based.

## **Safety effects of navigation systems**

A fifth to a quarter of Dutch drivers now have a navigation system and their share is still growing. A navigation system is first and foremost an individual tool to assist the user in reaching his destination along the shortest and/or fastest route. However, a navigation system also has road safety effects. The fact sheet *Safety effects of navigation systems* looks at the pros and cons of using navigation systems and makes recommendations to limit the negative effects.

## **Motorcyclists**

In a motorcycle crash, the lack of protection often leads to serious consequences for the rider and possible passenger. In the Netherlands, the fatality rate, per kilometre travelled, is 25 times higher



for motorcyclists than it is for car occupants; the injury rate is 20 times higher. The fact sheet *Motorcyclists* discusses the possible causes of crashes involving motorcycles and makes recommendations for measures that can reduce the number of these crashes.

*All fact sheets are available in English and can be consulted and downloaded on [www.swov.nl](http://www.swov.nl)*

# Publications

Below is a selection of reports that have recently been published by SWOV. Most SWOV reports are written in Dutch, but they all include an English summary. Reports that were published in or after the year 2000 can be found on our website ([www.swov.nl](http://www.swov.nl)) and may be downloaded free of charge. Fact sheets are also placed on our website under Research.

## **Road safety in 2007: is a standstill a step backwards?; Analysis of crashes, mobility, behaviour and policy**

W.A.M. Weijermars, Ch. Goldenfeld, N.M. Bos & F.D. Bijleveld. R-2008-12. 112+ 23 pp. € 20.- (Dutch) .

In recent decades, the number of traffic casualties has shown a decreasing trend and a remarkable and sudden drop in 2004. In the years 2005, 2006 and 2007 the number of fatalities showed a further decline to 791. It is not possible to give a precise explanation of these developments. It is known, however, that they are influenced by all sorts of changes in mobility, traffic behaviour, vehicle safety, safety of the infrastructure, enforcement, and other factors. This report describes the road safety developments and the relevant circumstances.

## **Safe speeds and credible speed limits (SaCredSpeed): a new vision for decision making on speed management**

L. T. Aarts, C.N. Van Nes, F.C.M. Wegman, I.N.L.G. Van Schagen & W.J.R. Louwerse. Compendium of papers of the 88th Annual Meeting of the Transportation Research Board TRB, Washington, D.C., 11-15 January 2009. (English).

Speed is an inherent characteristic of mobility and a hazard to safety. Several approaches exist of how to manage speed. In the Netherlands, the

emphasis has mainly been on harm minimisation during the last decades, due to the implementation of the Sustainable Safety vision. Speed management remains a core business in this vision, by means of an integral approach of speed management measurements.

A request from a number of regional authorities to assist them in developing a decision support system for speed management was the starting point for elaborating SWOV's vision on safe speed and credible speed limits (SaCredSpeed) into an algorithm. The SaCredSpeed algorithm uses input data of design, image and traffic characteristics of a particular stretch of road to assess a safe speed and speed limit for that particular situation. This safe speed is related to the real speed (V90; optional), and, depending on the fit, the credibility of the speed limit, the enforcement situation (optional), the network function of the road, the condition of the adjacent roads, and the priorities the decision maker wants to set, SaCredSpeed offers suggestions for adaptations. These can consist of a) speed limit adaptations, b) road design adaptations or c) additional enforcement adaptations. This integral approach to speed management from the view of safety and credibility can be a good addition to other speed or safety instruments that exist.

## **Perception of lack of traffic safety; An exploration of subjective safety**

W.P. Vlakveld, Ch. Goldenfeld & D.A.M. Twisk. R-2008-15. 91 pp. € 15.- (Dutch).

This report discusses what has been found in lit-

erature about subjective safety. This is safety as it is experienced during traffic participation, and the concern about traffic safety that one experiences outside traffic participation. The report looks at the effect of subjective safety on road traffic behaviour, on the acceptance of and compliance with traffic measures, and on prioritization of policy measures. This is followed by a brief survey of the development of views on subjective safety in the Netherlands during the past decades and the effects this has had on the institutionalization of the pursuit of improving road traffic safety.

## **Knowledge utilization in decision-making processes in provinces; Report of an experiment**

C.A. Bax & H.M. Jagtman. R-2009-03. 36 + 21 pp. € 11.25 (Dutch).

This report describes an experiment that was used to study the use of knowledge. In this experiment three cases were presented to eighteen policy makers and road designers in Dutch provinces. It has been investigated how they used the (presented) knowledge in these fictitious cases in their choice for a (safe) design of road sections or junctions. It has also been investigated to which extent barriers for knowledge use that were found in previous studies, play a part in this.

## **Factsheets:**

- Use of road safety knowledge by policy makers
- Safety effects of navigation systems
- Motorcyclists