SWOV
INSTITUTE FOR ROAD SAFETY RESEARCH

RESEARCH ACTIVITIES

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Contents:

Editorial

The European Commision intends to draw up legislation to make certain safety devices obligatory in new cars.The opening article takes a look at vehicle safety and the possibilities for further improvement of road safety. Also in this issue of Research Activities is an article about the developments in the public health sector which may contribute to a further decrease of the number of traffic victims.

Increased vehicle safety: contribution to improved road safety

In the last 30 years, vehicle safety measures have greatly improved road safety. However, efforts in vehicle improvement should not only be aimed at the safety of a car's occupants, but also at the safety of the car's crash opponent.

Since the 1970s many adjustments have been made to cars to increase the occupants' safety. These adjustments are known as secondary road safety measures. They include all facilities that make the outcome of a crash less severe. The best known are (the obligation to wear) seatbelts, airbags, and the improved car structure. These measures were arrived at along two paths: legal measures were taken and the car manufacturers themselves were active in improving their products.

Technological developments also make it possible for car manufacturers to improve primary safety. This means preventing crashes by for instance improving brakes, installing better speed management systems, fitting devices for keeping distance, and making more accurate steering possible. The driver can benefit from high-speed instruments supporting and simplifying the driving task.

QUOTE

"The death toll on European roads is unacceptably high. Bringing the benefits of eSafety to all road users is therefore a top priority of the Commission"

Viviane Reding, EU-commisioner for Information Society and Media

The intelligent car

In 2005, there were 8000 fewer road deaths in the European Union than in 2001. But not enough progress has been made and more effort will be needed, at national and European level, to achieve the objective of halving the number of road deaths by 2010.
In February of this year the European Commission announced the initiative "The intelligent car", part of the eSafety project, which calls upon citizens, the industry and EU Member States to work together to solve transport-related societal problems and to improve the take-up of information and communication technologies to this end.
Intelligent cars are smarter, safer and cleaner, and can make a contribution to solving the major problems in the field of road transport: safety, congestion and fuel consumption. Technology that prevents rear-end collisions could eliminate 4000 accidents per year across the EU if just 3% of cars had it by 2010. Technology that helps you stay in lane, or to overtake, could prevent 1500 accidents per year if only 0.6% of cars had it by 2010. And technology that wakens drowsy drivers could help prevent 30% of fatal motorway crashes and 9% of all fatal accidents.

Safety facilities

The European Commission also intends to draw up legislation that will make many safety devices standard equipment in new cars. Examples are electronic stability control (ESC), seatbelt reminders and the obligatory use of the Isofix anchoring system for child restraint seats.

The EU project eSafety - Improving road safety using information & communication technologies has its own website at http://europa.eu.int/information_society/activities/esafety/index_en.htm.

Contribution to road safety

Research abroad has shown that since 1970, the number of road deaths and in-patients has decreased by an average of 1% a year due to improvements in the crashworthiness of cars. In spite of a large increase in the number of vehicle kilometres in the Netherlands, from 38 billion in the early 1970s to nearly 110 billion now, the number of casualties among car occupants has shown a strong decrease over the past 30 years, from 1,350 deaths in the early 1970s to 414 in 2004. This decrease was achieved by tuning vehicles and infrastructure ever better to the demands of the driving task on the driver.

Yet more possibilities

SWOV still sees many possibilities to further decrease the number of traffic casualties by making car improvements. This can be done not only by concentrating on more safety for the car occupants, but also by paying more attention to safety for other road users.

SWOV expects the number of casualties to decrease further if:
- daytime running lights are made obligatory;
- a cyclist-friendly car front is introduced;
- cars' crash zones are made more compatible;
- safe driving speeds;
- more advanced and safety approved ITS applications are introduced.

The fact sheets 'Vehicle Regulations', 'Daytime Running Lights (DRL)' and 'ITS and road safety' all discuss various aspects of vehicle safety. They can be found on the SWOV website www.swov.nl under Publications.

Public Health and Road Safety

Post-crash care and international attention offer chances to reduce the number of traffic fatalities. Also, the road safety lobby can be strengthened by joining forces with organizations in the field of public health. These are some of the conclusions and recommendations of SWOV's exploration of public health and road safety.

The public health sector covers many areas, such as prevention, cure & care, pollution, and various relevant organizational questions. A wide range of factors affect public health: demographic developments, individual characteristics, lifestyle, social environment, etc. Many of these factors also affect road safety. The elderly, alcohol and drugs, physical disorders, but also psychological factors, are traditionally issues which are important for both fields. Mobility in general and road safety in particular, have a large effect on public health, and, the other way round, the extensive public health sector is an important influential factor for road safety. SWOV has made an inventory of past, present, and future developments within the public health sector in order to gain insight into the interests which are common to both road safety and public health. We have also analysed which opportunities and threats there are for road safety.

New possibilities

A new possibility for joint efforts of the fields of road safety and public health may be the issue of pollution. Pollution by the emission of harmful substances in traffic is estimated to be responsible for an increase in the number of deaths and in-patients during days of high air pollution, and for a 1 to 2 years lower life expectancy for people who are exposed to high levels of air pollution. Recent measures to reduce emissions and stimulate slower means of transport have been taken on the basis of pollution motives, but these measures also have obvious road safety consequences.

Post-crash care

The care after a road crash offers the public health sector opportunities to further reduce the

number of road deaths. In order to reduce the number of traffic fatalities and the seriousness of injuries, response to the initial call must, of course, be as fast as possible, and the first medical aid must be of a high quality. Past improvements, for example, are the use of trauma helicopters and improved training of ambulance personnel.
Practical matters can interfere with the most efficient ambulance transport. Regular consultation takes place between the ambulance and traffic sectors about matters such as road design, approach routes, and possible obstructions for ambulances. Improvements of the care within the first hour after a crash can be still be made by further training of ambulance personnel and by using better software which will improve the performance of a Central Ambulance Post.
A Mobile Medical Team, which uses a trauma helicopter, is usually sent to crashes with severe and multiple injuries. Trauma centres recommend that this should be done more often. They report that in only 14% of the cases in which a trauma helicopter is needed, one is actually sent.
Other interesting new initiatives will have a postive effect on crash victims. First this is the use of a so-called rapid responder, a nurse who is the first medically trained person at the scene and who starts the ambulance help. A second initiative which will improve the post-crash care is the use of an 'e-call' which electronically sends the information to the emergency services about for instance location, vehicle, driver, and also driving speed.

International developments

The World Health Organization (WHO) has been drawing the attention of public health to road safety. More attention from international public health organizations could lead to these sectors increasing their activities to improve road safety. In the longer term, this development could have a favourable influence on the trends in crash rates. At present, the WHO focusses its efforts at the less developed countries where there is more to be gained, but also WHO European Region pays attention to prevention of traffic injuries as showed in their 2004 report Preventing road traffic injury: a public health perspective for Europe.
More worldwide attention for road safety in the future could eventually also raise the sense of urgency in the Netherlands.

Further explorations needed

With this exploration of public health, SWOV has increased its knowledge of social processes and trends which are related to mobility, traffic risk, and injury severity. A more complete picture will emerge when the results of future explorations are known. SWOV will then be in a better position to explain past developments, explore future trends, and to be proactive in anticipating and responding to 'opportunities and threats' from a road safety perspective.

The SWOV report entitled ''Public Health and Road Safety: an exploration' can be found at our website www.swov.nl under Publications. The report is in Dutch, but has an English summary. The WHO European Region report ' Preventing road traffic injury: a public health perspective for Europe' can be read and downloaded from www.euro.who.int under Publications.

Mobile phones: both hand-held and hands-free bad for road safety

Drivers must be made more aware of the dangers of mobile phone use and various other distracting activities. Furthermore the legislation of mobile phone use should be based on scientific evidence. These are two of the recommendations which are made in the SWOV literature study on mobile phone use while driving.

In recent years, there has been an increasing focus on issues relating to drivers' inattention and the role of driver distraction in road safety. Driver distraction and inattention in its various forms is thought to play a role in 20-30% of all road crashes. The reason for this increased interest is largely due to new in-vehicle technologies (e.g. various in-vehicle information systems, advanced driver support systems, entertainment systems) whose popularity is rising but whose implementation is also accompanied by the rising fear of their distraction potential and related effects on road safety. The SWOV literature review *Use of mobile phones while driving - effects on road safety* analyses studies published in the period 1999-2005, and includes simulator studies, closed-track studies and studies on the real road.

Four-times higher risk

The mobile phone has become one of the most common devices present in vehicles today but also distracts the driver's attention. The results of epidemiological studies strongly suggest that using a mobile phone while driving can increase the risk of being involved in a road crash up to four times. In terms of victims, in the Netherlands alone, the use of mobile phones while driving could have been responsible for almost sixhundred people injured or dead in traffic crashes in 2004. Despite this high number of traffic victims, drivers do not seem to be entirely aware of the effects of mobile phone use on their driving performance. More than two thirds of all drivers admit to using a mobile phone at least sometimes while driving: they feel that they can cope with the possible distraction. Many drivers don't realise that using

a mobile phone while driving negatively affects their driving performance.

Legislation

Hands-free versus hand-held use of the mobile phone remains one of the most commonly investigated features. The vast majority of studies report that hands-free phoning does not have a significant safety advantage over hand-held phoning. Although hand-held units add to the driving task due to the need for operating the phone, the most important negative factor of mobile phone use is the same for both types of phone - the distraction from the driving task to the conversation itself. In all European countries the ban on hand-held phones while driving seems to be the most popular measure for regulating mobile phone use while driving (see *Table 1*). However, it would be more effective to ban the use of both hand-held and hands-free phones.

Increasing number of fines

Since the introduction of the ban on the use of hand-held phones in the Netherlands in April 2002, the number of fines for using a hand-held mobile phone while driving has risen significantly each year. However, without data on the intensity of enforcement, the question remains whether this increase is only due to increased mobile phone use or whether the intensity of enforcement in that period also played a part.

Recommendations

In order to better determine, control and reduce the negative effects of mobile phone use on road safety, the study has led to the following recommendations:

- Identify the extent of drivers' use of mobile phones more precisely in order to generate more exact data on the risk of mobile phone use while driving.
- Record mobile phone use in accident reports in order to produce a truer estimate of the number of mobile phone crashes in the total number of crashes.
- Develop precise criteria and methodologies for assessing the safety implications of in-vehicle information systems (IVIS), including mobile phones.
- Support company policies like those imposing a complete ban on the use of mobile phones while driving and other kinds of policies contributing to the corporate safety culture.
- Use the 'technology against technology' principle: future developments in technology could also provide the answer, at least partly, to solving the problem of driver distraction. A GPS could for instance get the added functionality of banning incoming phonecalls when one is driving.

Furthermore, the issue of other road users like cyclists and pedestrians using mobile phones should also be investigated. No research has yet been found into the effect of mobile phone conversations on the behaviour of these categories of road users. Everyday experience and the nature of interference caused by mobile phone conversations lead to the impression that mobile phone conversations could also have an adverse effect on the road behaviour of these road users. Therefore, cautious use of mobile phones in traffic by these road users is also recommended.

Both SWOV-report R-2005-12 'Use of mobile phones while driving - effects on road safety' and the fact sheet with the same title can be found on the SWOV website www.swov.nl under Publications.

Fact Sheets

Vehicle regulations

The fact sheet *Vehicle regulations* reviews the vehicle requirements on the national level as well as on the European level. In the interest of road safety, the Dutch government makes requirements of motor vehicles. In these requirements the relevant European Union directives need to be adhered to. However, the international directives are compromises between many parties and are not so much aimed at improving road safety, but at removing trade barriers. As a result, these vehicle requirements should be seen as *minimum requirements* from a road safety point of view.
Nevertheless, on certain features vehicle manufacturers make their vehicles better and safer than the law demands. This is partly an achievement of the EuroNCAP crash test programme. Although EuroNCAP targets on serving the customer, it also encourages vehicle manufacturers to aim at achieving an as good as possible test result.

DRIPs

The fact sheet *Electronic route information panels (DRIPs)* discusses the effects of DRIPs on route choice and the possible effects on road safety. Route information panels on motorways, and particularly the dynamic versions, can guide traffic to alternative routes to assist improving the traffic flow. In the Netherlands also, the term Dynamic Route Information Panel (DRIP) is used for an electronic route information panel. A DRIP usually indicates if there are tailbacks on various motorway alternatives to a particular destination, how long they are, and sometimes what the estimated journey time is. This is intended to influence the route choice and thus to improve the traffic flow.

Source: Transport Research Centre

It appears that DRIPs generally only have a slight effect on the route choice. This is probably caused by force of habit, a preference for a particular route, and insufficient reliability of the information about the journey time. If the journey information on DRIPs becomes more reliable in the future, we can expect a greater effect on route choice and perhaps also on road safety.

Intelligent Transport Systems (ITS) and road safety

This fact sheet discusses the developments in the field of Intelligent Transport Systems (ITS) and the effects on road safety.
The application of ITS in traffic is experiencing a mushroom growth and the expectations about the positive effects for road safety are high. However, many of the present ITS applications are aimed at increasing comfort and improving accessibility. In addition systems are being developed that primarily aim at road safety; examples are alcohol lock and seatbelt lock. Finally, there are systems like Advanced Cruise Control and Dynamic Route Information Panels that are not specifically targeted at, but do have an influence on road safety.

Driver training in steps: does it produce safer drivers?

In the Netherlands a modular approach to driver training has been experimented with in recent years, called the Driver Training in Steps (DTS). What are the differences between the traditional Dutch driver training and DTS, and which one is more effective in creating safe traffic behaviour? SWOV tries to find some of the answers.

Traditionally, the Dutch driver training consists of a learner driver taking 1 or 2 one hour-long driving lessons per week until the moment the driving instructor considers him sufficiently competent to take the driving exam. This training phase has no formal curriculum, nor a set didactic method. In addition, no legal requirements apply to training other than the use of a car with dual controls and the presence of a licensed instructor. A few years ago a modularly structured driving course called Driver Training in Steps, DTS, was introduced. Other than the traditional training which is primarily aimed at passing the driving test, DTS aims at safe and responsible traffic participation. It covers more topics and skills than the traditional driver training and it pays extra attention to safe traffic behaviour in particular. DTS could therefore have a positive effect on the crash rate of young novice drivers. SWOV reviewed different studies on the effectiveness of DTS versus traditional training.

DTS

DTS has well-defined educational objectives which are placed in four modules ranking from easy to difficult. A new module can only be started when a test shows that the pupil has mastered the objectives of the previous module. On average, the number of driving lessons in DTS is usually the same as in the traditional training, but more candidates pass their driving test at the first attempt. An evaluation of the driving test results showed that the DTS candidates did significantly better than pupils who had followed the traditional training.

Six months after licensing another evaluation was made, comparing driving skills and behaviour of DTS trained drivers to those who had followed a traditional training. *Table 1* presents the results for a number of specific behaviours: odds ratios smaller than 1 indicate a "better" result for DTS training. This time the DTS drivers still did slightly, but consistently better than the drivers who had taken the traditional training.

However, as can be seen in *Table 1*, most differences had become too small to be statistically significant.

DTS safer?

Although the evaluation results seem to indicate that the DTS is better than the traditional driver training, an alternative explanation is a possible self-selection bias: DTS may be the logical choice for those candidate drivers who consider road safety an important issue, and who may become responsible drivers irrespective of the training they have had.
The European project BASIC (www.cieca.be) did research into different models for driver training and made recommendations for the best practice driver training.
DTS meets most of the recommendations in the BASIC report, but fails on different points such as: acquiring sufficient driving experience, periods of accompanied driving, and a long enough learning period to let knowledge and skills take root. These apsects are inherent to what is called the graduated license
Based on our present knowledge of effective driver training SWOV concluded that DTS is a step in the right direction. Combining DTS with a graduated driver training is expected to be more effective. However, a graduated driver training does not exist in the Netherlands as yet.

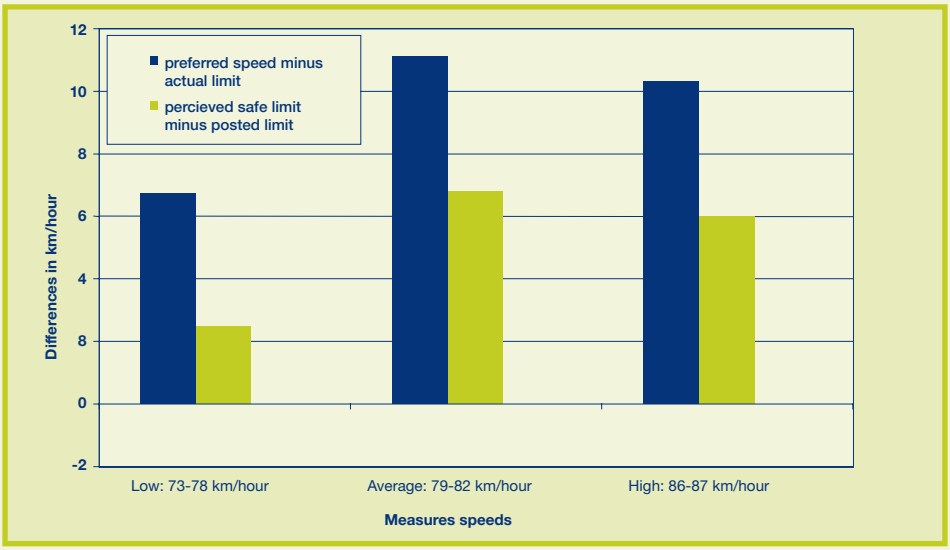
You can find more information about this subject in the SWOV fact sheets 'Driver Training in Steps', 'Young novice drivers' and 'The graduated driving license' which can all be found on www.swov.nl under Publications.

subject	Odds ratio	subject	Odds ratio
1. *Preparation before trip*	1.12	11. *Adjusted and decisive driving: speed*	0.85
2. *Vehicle handling*	0.37*	12. *Adjusted and decisive driving: decisions and actions*	0.87
3. *Vehicle control*	0.65	13. *Driving on straight and winding roads.*	1.09
4. *Energy saving*	0.51*	14. *Behaviour at intersections*	1.00
5. *Independent driving*	0.59	15. *Right and left turns*	0.69
6. *Social behaviour*	0.60	16. *Merging into and out of traffic streams*	0.83
7. *Defensive driving: Anticipation*	0.49*	17. *Overtaking*	0.71
8. *Defensive driving: visual scanning*	0.67	18. *Dealing with oncoming traffic and being overtaken*	0.72
9. *Defensive driving: Safety margins*	0.97	19. *Changing lanes*	0.89
10. *Risk awareness, hazard perception*	0.81	20. *Driving on non-standard road sections*	0.86

Table 1 Odds ratios on specific behaviours (Vissers et al., 2004). Those indicated with an "" were statistically significant (p< 0,05). Ratios <1 indicate a better result for DTS training.*

Credibility of speed limits: the influence of road features and personal characteristics

Motorists differ in their opinions on which speed is the most credible for a particular road, so it is impossible to have a speed limit that is equally credible for everybody. However, there are only small differences in the features that influence credibility for different (groups of) motorists. This makes it possible to set a limit that is more credible for everyone. These are the conclusions of a SWOV study of the influence of road features and personal characteristics on the credibility of speed limits.



Graph 1. Differences between preferred speed and speed limit, percieved safe limit and actual posted speed limit for 80 km/hour roads at different average speeds.

Speed is one of the most important road safety factors. Many motorists drive too fast for the circumstances and exceed the speed limit. At the same time, the percentage of offenders on some roads is considerably higher than it is on other roads, even though their limits are the same. This is assumed to be caused by, among other things, the (in)credibility of the speed limit. A speed limit is credible when motorists find it a logical limit that is in agreement with the road layout and situation. For a large part it is thought to be influenced by identifiable road features and the immediate surroundings. In an earlier SWOV study, *Safe and credible speed limits; A strategic exploration (R-2004-12),* this concept was introduced; now a start has been made with an empirical study of this concept.

First step

In an explorative study SWOV examined which features of the road and its immediate surroundings affect the credibility of an 80 km/hour speed limit on rural distributor roads. The study also investigated to what extent the credibility of a limit depends on road users' personal characteristics. The study is a first step towards making the concept 'credible speed limits' more concrete so that it can be put into practice.
Using photos of 27 different roads with an 80 km/hour speed limit, more than 500 motorists were asked how fast they would want to drive on that road at that moment, and which speed limit they considered to be safe. They also had to estimate the actual speed limit at each location. The motorists were also asked some personal characteristics like gender, their age, where they lived, how many times they had been fined for a speed violation, and their crash history. With a brief questionnaire the extent of the subject's inclination to seek variety and excitement (sensation seeking) was assessed.

Results

The results showed that, on average over the 27 situations, the subjects want to drive 8 km/hour faster than the 80 km/hour limit. On average they want to drive 5 km/hour faster than the speed limit they consider as safe. There were large differences between roads with regard to the preferred and the safe speeds. On some of the 80 km/hour roads the motorists would like to drive about 95 km/hour and on others about 75 km/hour. This indicates that an 80 km/hour limit is not equally credible for all roads. Of all 27 situations data on the actual speeds driven was also available. *Graph 1* shows that respondents indicated to want to drive the least fast on those road stretches that have the lowest actual speeds. The preferred speed and the limit that was considered to be safe, appeared to be related to a number of features of the road and its immediate surroundings. Most important was the presence of a bend, followed by the view ahead and to the right, the presence or absence of trees and buildings, and the road width. Men and women did not differ in the speed they said they would like to drive and the limit they considered safe. Personal characteristics are responsible for large differences between the answers of the subjects. The degree of sensation seeking has the strongest influence, but age and the part of the country one lives in, also contributed to the differences in judgements. Young drivers seem to attach less importance to road characteristics and its immediate surroundings when choosing their preferred speed and the safe limit than older drivers. Although there are differences concerning safe speeds and speed limits, motorists are influenced by more or less the same road features: on this issue the differences are only related to age.

Further research

Despite its limited scope, the present study came up with promising results and it is a good starting point for future research. Further research is necessary to find answers to questions like:

- Which road and environmental features influence the credibility of limits on other roads?
- Which, if any, road features are more important than others for determining credible limits?
- What is the effect of credible speed limits on the actual speed driven?
- How can the concept 'credible speed limits' be used for practical purposes?

The answers to these questions can be of help in the development of a practical instrument which assists road authorities in assessing the degree of credibility of speed limits for the roads in their network.

The Dutch SWOV reports R-2004-12 'Safe and credible speed limits; A strategic exploration' and R-2005-13 'The influence of road and personal characteristics on the credibility of 80 km/hour speed limits; An explorative study' have a summary in English and can be found on the SWOV website www.swov.nl under Publications.

Transportation Research Board Annual Meeting Washington D.C., 22 - 26 January 2006

At the end of January, the 85th Annual Meeting of TRB was held in Washington DC, and was attended by more than 9,000 professionals. Beside all the meetings of TRB committees and subcommittees, it offered more than 500 sessions in which 2,800 papers were presented. In short, there was an overwhelming number of people presenting or absorbing an enormous number of papers.

Attending the Annual Meeting forced one to make drastic choices because dozens of parallel sessions are held morning, afternoon, and evening. The daily schedule is from 8 a.m. to 9.30 p.m., and the whole Sunday is filled by workshops in which speakers present contributions in addition to the 2,800 papers mentioned above.

Before and after studies

SWOV's Atze Dijkstra attended the workshop

Cause, Effect, and Intervention: Current and Future Directions in Road Safety Research. Later that week there was a related session: Road Safety: the Road Ahead. The driving force behind both sessions was Ezra Hauer, a pensioned Canadian professor, who for many years has promoted crash assessment methods and techniques and their application and wrote a standard work entitled Observational Before and After Studies in Road Safety Studies.
The message of the workshop and session was twofold: preferably, do not conduct cross section studies but do before and after studies instead.

SWOV at TRB

SWOV contributed to the TRB 85th Annual Meeting with a paper entitled *Sustainable Safety in the Netherlands: Evaluation of a national Road Safety Programme*. This paper describes the process leading to the implementation of the Start-up Programme. There is special attention for the 'action plans' within this programme: functional road classification, expansion of 30 km/hour zones and 60 km/hour zones, mopeds in the roadway, large-scale introduction of roundabouts, etc. At the beginning of 2003 it was estimated that some 30,000 kilometers of 30 km/hour roads had been implemented, which is almost 10,000 kilometers more than was agreed on in the Start-up Programme. Furthermore, some 12,500 kilometers of 60km/hour road had been realized. The total length exceeds the original target of 3,000 kilometers by 9,500 kilometers. Without any doubt, this was a very successful result!

The exact contribution of the Sustainable Safety Start-up Programme to the reduction in the number of road crashes is difficult to calculate, more so because there is interaction between the various measures that have been implemented and because other activities such as enforcement, education etc. have continued. In general it can be stated that each of the infrastructural measures outlined in the original agreement has been implemented and that each one has contributed to making the road environment in the Netherlands safer. This effect is seen in the overall development in the numbers of traffic fatalities and hospitalizations in the Netherlands. Over the period 1997-2002, reductions of 9.7% in the number of fatalities and 4.1% in the number of hospitalizations were realized. This downward trend can partly be attributed to the first phase of Sustainable Safety. Although a formal evaluation study has not been carried out, a rough estimation is possible. In 2002, the total number of fatalities and hospitalizations that was prevented as a result of the Sustainable Safety measures was estimated to be between 1,200 and 1,300. This amounts to approximately 6% of the total number of fatalities and hospitalizations.
The lessons learned from the Start-ip Programme will be used in defining the next phase of Sustainable Safety.

The SWOV paper will be published in the TRB Transportation Research Records.

Colophon

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Next, conduct the evaluation in such a way that the results can be reduced to a clear cause and effect relation. The results of comparative studies usually produce inexplicable results that do not make clear the cause and effect, whereas the 'explanatory variables' found, do seldom transpire from other studies. Before and after studies can, in any case, be designed in such a manner that the effects of the changes carried out can be investigated. However, neither do these studies always show the underlying cause and effect relations. Hauer will shortly publish an extensive report about this subject.

Traffic simulation models

The poster presentations clearly showed that the application of traffic simulation models is on the increase. Among other matters, these models make it possible to gain insight in the number and nature of conflicts between vehicles in a road network. As yet, application of the models is aimed at the number of conflicts which occur in various situations, like, for example, various sets of measures at a crossroads. Further research is still needed to show which similarities and differences there are between simulated and real conflicts. This raises the old question about a possible relation between conflicts and crashes once again.

Pedestrian crossings

The US, just as the Netherlands, is worried out the phenomenon of pedestrian crossings. They don't have a uniform solution either, and many different ways have been thought of to ensure that motorists can see pedestrians crossing the road. The latest way is a gantry above the road with, on top, a flickering traffic light (two lamps above and one below), a traffic sign, and a warning sign, and another flickering traffic light beside the carriageway. The name of this construction is a 'HAWK beacon signal'. A study of the priority behaviour showed that, if there is a HAWK, about 95% of the motorists give right of way to the pedestrians crossing the road. This percentage is a lot lower for other types of pedestrian crossings. The US for example also has a type whereby a pedestrian has to take a flag out of a box, cross over with the flag in his/her hand, and when at the other side has to put the flag in another box. This type scores a percentage of 65%.

The 2006 TRB 85th Annual Meeting Compendium of Papers is available on CD-ROM. Some of the sessions of the TRB 85th Annual Meeting have also been made available as e-Sessions on the TRB website www.trb.org/meeting/.

Publications

Most SWOV reports are written in Dutch but they all include an English summary. Below is a selection of reports that have recently been published by SWOV. Records of all SWOV reports that were published from 1980 onward can be found on our website (www.swov.nl). Reports that were published in or after the year 2000 can be downloaded free of charge.

Use of mobile phones while driving - effects on road safety; A literature review

Nina Dragutinovic & Divera Twisk. R-2005-12. 55 pp. € 11.25 (in English)

The use of mobile phones while driving has become a road safety concern and has been the focus of various behavioural studies. This literature review analyses studies published in the period 1999-2005, and includes simulator studies, closed-track studies and studies on the real road.

The influence of road and personal characteristics on the credibility of 80 km/hour speed limits; An explorative study

Dr. Charles Goldenbeld, Ingrid van Schagen & Linda Drupsteen. R-2005-13. 56 + 51 pp. € 17.50 (In Dutch with an English summary)

This study investigates which characteristics of both road and environment affect the credibility of 80 km/h limits in rural areas. It also investigates to what degree personal characteristics influence how the credibility of the km/h limit is experienced. The credibility of a limit can be improved by adjusting the limit to the road characterics, or by adjusting the road characteristics to the speed limit.

The influence of spatial planning and policy on road safety; An exploration

Chris Schoon & Madelon Schreuders. 68 + 11 pp. € 12.50 (In Dutch with an English summary)

planning influences the development of traffic and transport, and of road safety. This study aims at providing insight in the road safety effects of developments in traffic planning in relation with spatial planning, now and in the future. The study concludes that steering on six 'robust' spatial factors seems the most promising: proximity, single centre or multiple centre orientation, degree and type of urbanization, connection to the main structure of public transport, mixing of functions and facilities, and spatial planning at street and neighbourhood level.

Fact sheets:

- Vehicle regulations
- Electronic route information panels (DRIPs)
- Cars submerged in water
- Intelligent Transport Systems (ITS) and road safety

SWOV
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