

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

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Informal education: parents as teachers

Learning to behave safely in traffic requires a lot of time, practice, and the good example set by others. Parents are the most obvious persons to actively support this informal learning process of the children, especially the youngest ones. This is one of the recommendations in the SWOV report 'The role of parents in the informal learning process of children in the age group 4 to 12 years old'.

Parents are often the ones who familiarize their young child with traffic, choose the mode of transport, and are an exemplary role model. This does not only concern traffic skills, but also good traffic habits. *Formal* traffic education, that is to say education projects in schools for children (and sometimes also their parents), is often found to have a modest effect; one of the reasons being that schools only have limited time for traffic education. SWOV therefore recommends paying more attention to the *informal* learning process.

Mainly the parents

Especially because informal traffic education takes place independent from the formal traffic education by authorities and schools, it is difficult to formulate and apply policy for informal education. It is clear that the focus should mainly be on the parents' role and the conditions that are required for fulfilling that role. Parents need, for example, background information about the knowledge, skills and limitations of their children, but also about the traffic environ-

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Editorial

Two of the topics in the December issue of *Research Activities* are the alcolock and rehabilitation courses in the Netherlands. The opening article discusses the role parents can play in teaching their children how to behave safely in traffic.

**Dress brightly in
cool gear if it's
hospital you fear**

'Be bright, Be seen' campaign,
DfT United Kingdom

QUOTE

ment, like the road layout of the route to school. Furthermore, parents need not only be capable of having a more active role in their children's traffic education; they must also be willing to. Parents' motivation therefore also requires attention. Finally, it is also important how the parents themselves behave in traffic: after all, they have an important exemplary role.

Information

A 'development test' can be used to provide the parents and those looking after the children with the necessary background information. This test enables them to make sure whether or not their children are ready for certain exercises and modes of transport. The test must contain as much information as possible about the children's developmental stages, skills and limitations in traffic, given a certain age. By applying a test, the large individual differences in the development of young children are taken into account. A similar type of test could be developed to let parents assess the safety of the route to school.

Motivation

Schools sometimes complain about the traffic situation in their immediate vicinity, for example in reaction to parents saying that they consider it unsafe. However, adaptation of the layout is not always the

solution, because there is not always an objective indication that the traffic situation is indeed unsafe. Feelings of unsafety can then be used to impress on the parents the importance of practicing with their children in traffic. They can be encouraged to use the school environment to familiarize their children with traffic. In addition, it could be stressed that traffic education is an important part of the child's general knowledge. Parents can use informal traffic education to stimulate their children's independence and their ability to cope.

Exemplary behaviour

The parents' role in informal traffic education is very demanding. They not only need to know their children's strengths and weaknesses, but also their own: the parents must prevent children copying their ingrained errant behaviour. They need to ask themselves whether their own traffic behaviour, which has become an automatism, is sufficiently exemplary.

Changing automatic traffic behaviour requires a special approach. One way is to approach parents with information at a moment in their lives in which their routine is broken anyway. This can for instance be moving house or child birth, but it can also be a road closure. For unnoticed changing of automatic behaviour, 'priming' may be an option. Priming is offering words or images that people associate with a specific concept, the desired behaviour in this case. Another possibility is to present parents

with the correct example and to stress that many other parents already behave like this – taking the children to school on foot or by bicycle, for example. This can strengthen the behaviour. Finally, the way in which a message is formulated can have a strong effect on the recipient's behaviour. All these means can be used to positively influence the parents' exemplary role.

Further steps

A number of steps need to be taken before the insights described above can be put into practice. For example, there is a need for a complete and systematic overview of the skills and limitations of 4-12 year-olds in traffic, including new insights into the development of children in general. The best ways to confront parents with this information should also be inventoried. Then possible partners can be approached who can stimulate parents to familiarize their children with traffic. Examples are schools and after-school child care, but also the National Health Service. The results of these preliminary steps can be used for a pilot study to be carried out among a small number of parents to get an indication of whether this approach will be successful. ◀▶

SWOV report R-2010-19 'The role of parents in the informal learning process of children in the age group of 4 to 12 years old; A first investigation' can be consulted and downloaded at www.swov.nl. The report is in Dutch with an English summary.

New European road safety plan: 50% fewer fatalities in 2020

In 2009, 35,000 people died on European roads, and 1.5 million were seriously injured in road crashes. This is a 36% decrease since 2001. But Europe aims for more: it has set its target at cutting the number of road fatalities by 50% between now and 2020.

This was announced by the European Commission in June 2010 when it presented the new programme for the next ten years entitled "Towards a European road safety area: policy orientations on road safety 2011-2020".

Focus on citizens

Citizens are at the heart of the European plan and are encouraged to take responsibility for the safety of themselves as well as others. An important aspect is the safety of vulnerable road users. The EU wishes to improve road safety and secure citizens' safe, and at the same time clean, mobility. The principles of subsidiarity and proportionality make road safety a shared responsibility: sometimes actions must be taken at the European level,



at other times at the national, regional or local level.

Quantitative target

The European Commission proposes halving the overall number of road deaths in the EU between 2010 and 2020, as was the European target for the period 2001-2010. In 2009, a reduction of 36% had been realized. This is a considerable percentage, even though the target of a 50% reduction will in all probability not be achieved by 2010. No target has yet been set for the number of serious road injuries. The Commission is willing to do so, but a common definition of serious injuries and

less serious injuries needs to be decided on first. At present different countries use different definitions.

Actions

The specific actions for the coming period are in fact a continuation of the actions in the previous ten-year programme and are aimed at education, enforcement, infrastructure and vehicles. Some of the actions that are formulated in the document are:

- The Commission will work, in cooperation with Member States as appropriate, on the development of a common educational and training road safety strategy including notably the inte-

The possibilities of Naturalistic Driving

For many countries it becomes increasingly difficult to maintain the same rate of road safety improvement, now that the most obvious measures have been taken. For further substantial casualty reductions, a major breakthrough in effective policies and measures is needed. The Naturalistic Driving method offers interesting new possibilities.

Typically, in a Naturalistic Driving (ND) study passenger cars, generally the subjects' own cars, are equipped with devices that continuously monitor various aspects of driving. These aspects include vehicle movements, driver behaviour, and road, traffic and weather conditions. The ND method makes it possible to observe and analyse the interrelationship between driver, vehicle, road and other traffic in normal situations, in conflict situations and in actual crashes. Similarly, motorcycles could be equipped: naturalistic riding. Naturalistic site-based observations can help to increase our knowledge about the specific problems of pedestrians and cyclists. This type of research has become possible by technological developments

gration of apprenticeship in the 'pre-licensing' process as well as common minimum requirements for driving instructors;

- The Commission will work towards developing a common road safety enforcement strategy;
- Ensure that European funds will only be granted to infrastructure compliant with the road safety and tunnel safety Directives;
- The Commission will make proposals in view of the progressive harmonisation and strengthening of roadworthiness tests and technical roadside inspections;
- The Commission will make proposals to encourage progress on the active and passive safety of vehicles, such as motorcycles and electric vehicles;
- The Commission will cooperate with the Member States with a view to improving data collection and analysis as regards accidents and developing the role of the European Road Safety Observatory.

The plan does not indicate to which extent these actions will contribute to achieving the set targets. ◀▶

The full document "Towards a European road safety area: policy orientations on road safety 2011-2020 (SEC(2010) 903)" is available at the website of the European Commission: http://ec.europa.eu/transport/road_safety/pdf/com_20072010_en.pdf



in data collection, data storage capacities, data-mining, image processing, et cetera.

Added value

Compared to the more traditional research tools, like driving simulators, instrumented cars and (micro)simulation models, ND studies have an added value: the observation of road users in their natural environment offers the possibility to improve our understanding of the causes of safety problems and for modelling driver behaviour in both normal and critical situations. For example, for well-known risk factors such as distraction and fatigue, ND studies can provide valid information about their prevalence and the actual relationship with crashes. Other issues for which the ND method would be a useful method include:

- The interaction between driver and vehicle and its relationship with road design characteristics or weather conditions;
- Assessment of the driving style of specific road user groups, e.g. novice drivers, the elderly;
- The use of mobile phones or other in-car information devices and the relationship with particular behaviour patterns or crashes;
- The interaction between motorized vehicles and vulnerable road users.

In addition, ND is expected to provide valuable knowledge about human behaviour in relation to exhaust emissions, fuel consumption, traffic circulation, and traffic management.

US experience

The potential of ND studies was illustrated in the United States by what is known as the '100 car-study'. In this study 100 fully equipped cars were driven in Washington DC and the Northern Virginia area for one year. The resulting dataset included

around 2 million vehicle miles and 43 thousand vehicle hours of 241 drivers. The data included 15 police-reported crashes, 67 non-reported crashes, 761 near-crashes and 8,295 incidents. The data was used for several analyses focusing on different research questions. One of the interesting outcomes was the prominent role of distraction in crashes, near crashes and incidents. The success has led the US to start a large-scale naturalistic driving project in the Strategic Highway Research Project 2 (SHRP2), involving almost 2,000 equipped vehicles and around 3,000 drivers over a period of one or two years.

Various European initiatives

In Europe there are also several initiatives in the area of ND, all co-funded by the European Commission. These include INTERACTION about the interaction between driver and in-vehicle technologies, 2BSAFE about the safety of motorized two-wheelers and DaCoTA about safety performance indicators, near crashes and exposure data as input for the European Road Safety Observatory ERSO. Finally, there is the PROLOGUE project that looks at the usefulness and the feasibility of a large-scale European study comparable to the large-scale study in the US. This last project is coordinated by SWOV and will present its final results and recommendations in a Pan-European workshop in June 2011 in Vienna. ◀▶

More information about Naturalistic Driving is to be found in the English fact sheet "Naturalistic Driving; observing everyday driving behaviour" to be consulted and downloaded via www.swov.nl/research/factsheets. More information about the PROLOGUE project and, in due course, about the Pan-European workshop is available at <http://www.prologue-eu.eu/>

Safer interactions by enhancing social forgivingness

In traffic, road users continuously interact with each other. The safety of these interactions can be increased through socially forgiving traffic behaviour. Social Forgivingness is the new Sustainable Safety principle that focuses on the responsibility of road users within the traffic system.

In the updated Sustainable Safety vision of 2006, two new safety principles were added to the original three of functionality, homogeneity and predictability. The first new principle is State Awareness and this refers to the ability to assess whether you are able to safely handle the driving task. The second added principle is forgivingness both of the environment – physical forgivingness – and of road users – social forgivingness. SWOV conducted several studies to elaborate the principle of social forgivingness.

Definition & theory

Everybody probably has some intuitive idea about the meaning of social forgivingness.

When looking at it from several different angles and including different components, the concept was formally defined as:

"The willingness to anticipate on potentially unsafe actions of another road user and to act in such a way that negative consequences of a potentially unsafe action are prevented or at least limited".

Based on a theoretical exercise, it was concluded that socially forgiving behaviour is likely to be affected by both internal and external factors. Examples of internal factors are cognitive and motivational factors. Cognitive factors influence the capability to behave socially forgiving and motivational factors influence the willingness to behave socially forgiving. An important external factor is the situational setting of the traffic task.



This setting comprises the design and function of the traffic system, as well as its use. We may, for instance, think of the lay-out of a road, and the local traffic rules, but also of the amount of traffic at a particular moment and the direction from which specific road users approach. The situational setting can also have an effect on capability and willingness. For example, in a situation with a limited view of the intersecting roads, one may not be *able* to be socially forgiving; in a situation with a traffic light with very brief green intervals one may not be *willing* to be socially forgiving.

Empirical studies

Subsequently, the big question is how to study the concept empirically and how to empirically assess the factors that affect the level of social forgivingness. Two methods were used. One method was an observation study in which the interactions at a traditional, *more regulated* traffic location - an intersection with traffic lights, priority signs and markings - were compared with the interactions at the same location after reconstruction into a roundabout following the principles of Shared Space. The new situation, having fewer explicit traffic elements regulating the interactions between road users is considered *less regulated*. The other method was an online questionnaire. In this questionnaire, six scenarios were staged

and filmed in more and in less regulated settings from a car driver perspective. This resulted in a total of thirty short video clips in which pedestrians or cyclists were encountered. Respondents were asked about aspects of their probable traffic behaviour in the situation which was presented to them. Behaviour considered relevant for social forgivingness was focused on, notably speed choice, speed adaptation, and adaptation of the lateral position.

Some results

Both research methods allowed for assessing relevant behaviours such as changes in speed and position on the road. However, subsequently, a number of assumptions are needed to decide whether or not this behaviour can be characterized as socially forgiving. Moreover, behaviour that cannot easily be observed or not be observed at all, can also be socially forgiving. When comparing the more and less regulated situations, it shows that the level of regulation particularly affects how, when and where road users meet. Also the judgements of the filmed road situations show the importance of the physical context of the behaviour. Hence, it is likely that the interpretation of a traffic situation largely determines the level of social forgivingness. ◀▶

Social forgivingness is the topic of two SWOV reports: R-2009-8 "Social forgivingness, a theoretical exploration" and R-2010-17 "Measuring and influencing social forgivingness". These reports are in Dutch with an English summary. They can be consulted and downloaded from www.swov.nl/research/publications. There is also an English fact sheet about this topic, to be consulted or downloaded from www.swov.nl/research/factsheets

Roundabouts in the Netherlands: overall strong road safety effect established

The reconstruction of intersections into roundabouts in the period 1999-2005 has resulted in a significant decrease of the numbers of fatalities and serious road injuries in Dutch traffic. This was established in a SWOV study that was the first to investigate the results of all roundabouts that were constructed in the Netherlands during this period, instead of studying just a sample. For the 2000 reconstructed intersections that were

studied the results show a decrease of 76% in the number of fatalities, and of 46% in hospitalized injuries.

Remarkable growth

Since the 1980s the number of roundabouts in the Netherlands has seen a remarkable growth; after 1998 their number has more than doubled. The number of roundabouts increased from 1442 in 1998 to 3451 in 2005. Especially during the Start-up Programme Sustainable Safety which

was carried out from 1997 to 2002 many roundabouts were constructed; many of these new roundabouts were reconstructed intersections.

Research

International before-and-after studies often report the effects of these reconstructions and although the precise effects that are found differ, the decrease in the number of crashes is generally found to be significant. But what is the general picture in the Netherlands? Has the recon-

struction of intersections into roundabouts been demonstrably effective?

Method

SWOV investigated the effects on both the number of crashes and the numbers of casualties on all roundabouts that were constructed in the Netherlands during the period 1999 to 2005. The study used the crash data before reconstruction of the intersection and the crash data of the new situation and focused on the fatalities and serious road injuries.

Roundabouts in the Netherlands are registered in the National Road Database which is updated annually. SWOV used this geographic information system (GIS) to link the apparent construction date (found by comparing different years of the road database) of a roundabout and the crash data before and after the construction. In some cases the original intersection may not have been situated at the precise location of the roundabout, and this may have slightly biased the results.

Decrease

The findings in the SWOV study correspond to the findings in other studies. However, this was the first study to establish statistically significant effects for the fatalities. This was not the case in earlier studies found in literature.

The results have no predictive value for specific roundabouts, but must be seen as average values. Despite the limitations of the used method it may be concluded that the study of all reconstructions of intersections into roundabouts during the period 1999 - 2005 has shown a significant decrease in road fatalities. For 2006, the decrease was about 76% for fatalities and about 46% for all casualties in the police registration, both fatalities and serious road injuries. This amounts to a reduction of 12 fatalities and 90 serious road injuries in 2006 as compared with the situation before the reconstructions were carried out. ◀▶

SWOV report 'Roundabouts; Effects on road casualties in the Netherlands' (R-2010-21) has been written in English and can be consulted and downloaded at www.swov.nl under Publications.



Preventive alcolocks for professional drivers: a promising option



Earlier this year, Dutch Parliament approved the introduction of alcolock programmes for serious drink driving offenders in the Netherlands and the new Minister of Infrastructure and the Environment Melanie Schultz van Haegen now aims to effectuate the introduction in May next year.

In addition to using alcolocks for offenders, SWOV suggests to consider the preventive use of alcolocks for specific groups of professional drivers. When looking at alcohol dependent drivers, very little is known about the use of preventive alcolocks. These conclusions are based on an inventory by SWOV of preventive application of alcolocks in other countries worldwide that was published recently.

Questionnaires

Since the scientific literature of the preventive use of alcolocks is very limited, it was decided to use a questionnaire to obtain the relevant information. This questionnaire was sent to 21 experts in the area of preventive use of alcolocks in Europe, North America and Australia, 17 actually completed the questionnaire. Although such an inventory does not yield any (scientific) evidence of the safety effects of preventive use of alcolocks, it does form a basis for some considerations in relation with this topic. The questionnaire results were complemented with information from the literature.

Experiences elsewhere

So far, only Sweden has applied preventive alcolocks for professional drivers. Commercial users in Sweden particularly considered the alcolock as a quality aspect that speaks to the advantage of their company. Since the year 2000, over 55,000 alcolocks have been installed in trucks, buses, school buses, and taxis. Fin-

land and France are about to follow the Swedish example. Some transport companies in other European countries equipped their vehicles with alcolocks. So far the governments of the USA, Canada, and Australia have not been very interested in alcolocks for professional drivers and hardly any have been installed. As reported in this questionnaire, an important reason for the lack of interest in these countries relates to the complex operating procedures of the current generation of alcolocks. The experiences with alcolocks for alcohol dependent drivers are largely limited to a couple of small-scale trials in European projects. From the road safety point of view the cost-benefit ratio of preventive use of alcolocks in buses, taxis and trucks is less favourable than preventive use in serious offenders' vehicles.

Professional drivers

The available international information forms a basis for a number of considerations in relation with the preventive use of alcolocks for professional drivers. Because of the vulnerability and dependence of school children and disabled people, SWOV advises to consider mandatory installation for the transport of these groups. Regarding preventive alcolocks in trucks, taxis and public transport further implementation is probably best left to free-market processes. Experience in Sweden showed that in one out of 10,000 trips a truck driver had a BAC of 1 promille or more. It is advisable, independent of whether or not their use is made mandatory, to set quality standards for the alcolocks. It suffices to make the existing international Cenelec standard for preventively used alcolocks mandatory in the Netherlands.

Alcohol dependent drivers

The situation is more complex for – voluntary – preventive use of alcolocks by drivers with an alcohol problem. On the one hand, an alcolock programme may have a positive safety effect for this group, but, on the other hand, there has hardly been any experience worldwide. Therefore it would be sensible to obtain more information, for example, by carrying out a thorough study that explicitly compares the pros and cons of an alcolock on the one hand and license suspension on the other. ◀▶

This study is published as SWOV-report R-2010-20 "An inventory of the preventive use of alcolocks in Europe, North America and Australia". The report is in Dutch with an English summary. It can be consulted and downloaded from www.swov.nl under publications.

Rehabilitation courses for traffic offenders in the Netherlands: effectiveness ambiguous

The recently published SWOV Factsheet *Rehabilitation courses for traffic offenders* describes when and how rehabilitation courses are presently applied in the Netherlands and gives examples of such courses in other European countries. The factsheet also looks at the effectiveness of rehabilitation courses and the possibilities to improve both their methodology and their content.

In the Netherlands, road users who have committed a serious offence are often sentenced to compulsory participation in a rehabilitation or driver improvement course. The offender has to pay the costs of such a course. Rehabilitation courses are educational measures that are aimed at decreasing the risk of crashes by correcting deviant driving behaviour. Two of the Dutch rehabilitation courses are aimed at alcohol offences: the Educational Measure Alcohol and Traffic (EMA) and the Light EMA (LEMA). The Netherlands also has an Educational Measure Behaviour and Traffic (EMG) which can be imposed for heavy or repeated offences, for instance in relation with speeding or aggressive traffic behaviour.

Drink-driving

The EMA is a three-day course for those who have participated in traffic with a blood alcohol content of between 1.3‰ and 1.8 ‰. The legal limit in the Netherlands is 0.5‰. The EMA is compulsory and the driving licence is suspended if the offender fails to attend the course or is not sufficiently active. The attendance fee for the EMA is just over € 700.-. The purpose of the EMA is to teach drivers how they can separate drinking alcohol from road use. The course is taught by an experienced trainer who is employed by an institute for addiction care. An EMA group consists of eight to twelve participants. In 2009, more than 8000 offenders followed an EMA course.

Alcohol and novice drivers

The LEMA consists of two half-days with a duration of 3.5 hours each and the attendance fee is almost € 400.-. The LEMA is intended for novice drivers who have obtained their driving licence less than five years previous to the offence and who were stopped with a blood alcohol content of between 0.5‰ and 0.8‰. The legal limit for novice drivers in the Netherlands is 0.2‰. The course is compulsory; refusal to attend or insufficient participation leads to suspension of the driving licence. Novice drivers with a higher blood alcohol content and repeat offenders are made to attend the EMA. The idea behind the LEMA is that this particular group, with this blood alcohol content, can still be guided in the right direction with

a relatively mild approach. The reason being that novice drivers are not expected to have already become habitual drink-drivers. Like the normal course, the LEMA is also taught by a trainer who is employed by an institute for addiction care and is attended by eight to twelve, mostly young, offenders. In 2009, almost 800 participants followed a LEMA course.

Behaviour

The EMG (Educational Measure Traffic Behaviour) is intended for drivers who have repeatedly displayed deviant driving behaviour in the course of one car journey. The EMG can also be imposed for a single serious speeding offence. It must be certain that the offender is the person being guilty of the offence before he is sentenced to attending the EMG. Therefore, the EMG cannot be imposed on licence number only. Other conditions are that a driver has displayed intentionally dangerous driving behaviour, has shown a lack of hazard perception, has not interacted correctly with other road users, or has offended against traffic rules and traffic signs. Participation of the three-day EMG course is compulsory and the attendance fee is almost € 800.-. The course aims at making the offender aware of the hazards their behaviour

causes for others. In 2009, almost a 1000 offenders followed an EMG course.

Effectiveness ambiguous

On the basis of both Dutch and international information the effectiveness of rehabilitation courses cannot clearly be established. Some of the evaluations indicate an effect on attitude, behaviour, crash rate, and recidivism; other evaluations indicate no effect at all.

As yet, only the EMA has been evaluated in the Netherlands. This Dutch study into the effects of the EMA indicates an effect on knowledge, attitude and behavioural intentions, but no data is available about effects on the crash rate and recidivism. The EMG is presently being evaluated and an evaluation of the LEMA is also expected. International studies indicate that measures that are found to be effective are usually carried out in combination with a temporary or permanent suspension of the driving licence. Little is known about the influence of the didactic approach and the skills of the trainers on the effectiveness of rehabilitation courses. ◆◆

The factsheet 'Rehabilitation courses for traffic offenders' can be found on www.swov.nl under the special link on the homepage.

5th International Fit to Drive Congress in The Hague on 7 - 8 April 2011



Reality and Vision - Common problems, European Solutions: this is the motto of the 5th Fit to Drive congress on the topic of fitness to drive and related road safety matters in Europe. As the fifth in a series of similar events, Fit to Drive will take place from April 7th - 8th, 2011 in The Hague (Netherlands). The congress is organised by the German Association of Technical Inspection Agencies (Verband der TÜV e. V.) in cooperation with SWOV (Institute for Road Safety Research), CBR (Centraal Bureau Rijvaardigheidsbewijzen) and several scientific and professional organisations. Speakers from EU institutions and a range of European countries will address the following top-

ics: primary prevention in pre-school, school and driver education and training; general prevention through legislation and enforcement, demerit point systems; secondary prevention with a special focus on the persistent drink-driver; risk assessment in medical and psychological matters; driver counselling, assessment, rehabilitation and therapy in different countries of the EU, interlock systems and rehabilitation and comparative studies of traffic safety in Europe. ◆◆

Further information about the programme, the location and how and where you can register is available at the website www.fit-to-drive.com.



From car to bicycle: road safety effects

If in the Netherlands 10% of the distances shorter than 7.5 kilometres were to be travelled by bicycle instead of by car, this would presently result in an expected increase of 4 to 8 road deaths and approximately 500 serious road injuries per year if all other conditions remain unchanged. This is the conclusion in the recently published SWOV report *The safety effect of exchanging car mobility for bicycle mobility*.

Drivers and cyclists

Since cyclists are vulnerable road users, they are less safe in traffic than vehicle occupants. Cyclists are injured more easily in a road crash and they have a high risk of fatal or serious injury in crashes involving a motorized vehicle. They also quite often sustain injury in crashes not involving any other vehicle: the Dutch hospital registration indicates an annual total of 5,000 serious road injuries. Bicycle crashes not involving other vehicles are seldom fatal.

The situation is relatively different for drivers: they less often sustain serious injury in single vehicle crashes, but there are 200 road deaths per year in such crashes. This data raises the question what the road safety effects would be if the bicycle is used more instead of the car.

Public health effects

The National Institute for Public Health and the Environment (RIVM) has recently investigated the effect on public health in the Netherlands if short trips by car are replaced by bicycle trips. In their study they looked at physical exercise, environment and road safety. SWOV was asked to make the calculations for road safety.

Because too little data is available for an exact calculation of the number of casualties that is to be expected, SWOV made a preliminary estimate of the effects that are to be expected. This esti-

mate indicates that there will be no overall road safety improvement. On the contrary, a 10% shift from car to bicycle for all trips shorter than 7.5 kilometres would lead to an increase of 4 to 8 road deaths and about 500 serious road injuries per year.

When the road safety effect is included in the overall health effect, the RIVM study expects a net positive effect on public health in the Netherlands when short trips are made by bicycle instead of by car. The physical exercise of so many cyclists turns out to be a positive public health effect. If all Dutch citizens were to use the bicycle one extra day per week and cycle half an hour longer, the maximum reduction in sick leave would be 1.3%, according to the RIVM study.

Age and gender

The road safety effect of the shift in mobility differs for age and gender. Research shows, for instance, that a shift from car to bicycle use leads to a decrease in the number of road deaths among young road users (<35 years old), but at the same time causes an increase among older road users. This is because for older drivers the car is safer than the bicycle.

For the serious road injuries the shift in mobility leads to an increase in the number of casualties for almost all ages. The exception are 18 and 19 year-old males: they are better off using a bicycle than driving a car. It may therefore be worthwhile investigating how cycling safety can be improved, particularly for older cyclists. ◆

SWOV report R-2010-18 'The safety effect of exchanging car mobility for bicycle mobility; Substituting a small number of short car trips with bicycle trips' is in the English language and can be consulted and downloaded at www.swov.nl. The full RIVM report 630053001 'Exchanging car trips by cycling in the Netherlands' can be downloaded at their website www.rivm.nl.

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.

New definition of serious road injury

In the Netherlands, the Minister of Transport has decided to define a *serious road injury* as a casualty who has indeed sustained severe injury. To determine the severity, the medical classification of injury according to the Maximum Abbreviated Injury Scale (MAIS) is used. MAIS classifies injury on a scale from 1 (light injury) to 6 (fatal injury). The term serious road injuries will only refer to those casualties who

have been admitted to hospital with an injury severity of at least 2 (MAIS2+).

Term 'inpatient' no longer used

The new term 'serious road injury' and its definition replace the term inpatient. An inpatient used to be defined as a traffic casualty who had been admitted to hospital for at least one night. Until recently this was considered as a

synonym of a serious road injury. However, research showed that this was not always a good indication of the injury severity; casualties who are admitted to hospital for observation are often found to have sustained no injury or no severe injury. Use of the new term serious road injury and its definition will exclude this group of casualties. ◀▶

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) and may be downloaded free of charge. Fact sheets are also placed on our website under Research.

Serious road injuries in the Netherlands in 1993-2008: road casualties admitted to hospital with a MAIS score of at least 2; Description and justification of the estimation method

M. Reurings, R-2010-15. 70 + 45 pp. € 17.50 (Dutch).

Road safety policy aims at reducing the number of road fatalities and serious road injuries. It is therefore important to know how many of such casualties there are in the Netherlands. This report only looks at the numbers of serious road injuries: the casualties admitted to hospital with an injury severity of at least 2 on the MAIS scale. It describes the new estimation method for the number of serious road injuries and makes an estimation of their numbers for the period 1993-2008.

Measuring and influencing social forgivingness; An investigation of the observability of social forgivingness in relation with behaviour in different traffic environments

A. Stelling, M. Houtenbos & R. Nägele, R-2010-17. 70 + 40 pp. € 17.50 (Dutch).

In 2005, (social) forgivingness was one of the principles which supplemented the Sustainable Safety vision. A definition of this principle was formulated in an exploratory report. The present report goes into the principle of social forgivingness in more detail. First it is investigated to what extent social forgivingness can be determined on the basis of observable behaviour. Next the extent is examined to which expressions of social forgivingness are influenced by the locational characteristics in which the traffic task is performed.

The safety effect of exchanging car mobility for bicycle mobility; Substituting a small number of short car trips with bicycle trips

H. Stipdonk & M. Reurings, R-2010-18. 26 + 2 pp. € 8.75 (English).

This report describes the analysis of the effect of exchanging passenger car mobility for bicycle mobility on the number of fatalities and serious road injuries in the Netherlands. The analysis considers a substitution of 10% of car trips shorter than 7.5 km by bicycle trips. Although a precise calculation of this effect was not possible due to lack of information, it has been possible to give a first rough approximation of the safety effect.

The role of parents in the informal learning process of children in the age group 4 to 12 years old; A first investigation

T. Hoekstra & D. Twisk, R-2010-19. 35 pp. € 10.- (Dutch).

Traffic education often takes the form of education projects, offered by schools and aimed at children and sometimes also their parents. In addition to such 'formal' education learning safe behaviour requires much time, practical exercise and examples set by others: the 'informal' learning process. This report discusses a preliminary investigation of new ways to improve road safety of children aged 4 to 12, using informal education as a starting point. The parents' role as informal teacher is worked out in more detail.

New fact sheets

- Rehabilitation courses for road users
- Use of media devices by cyclists and pedestrians
- Visual impairments and their influence on road safety

An inventory of the preventive use of alcolocks in Europe, North America and Australia

R. Mathijssen, R-2010-20. 18 + 5 pp. € 8.75 (Dutch).

This report makes a worldwide inventory of to what extent alcolocks are used preventively and how this type of use has been stimulated. A brief survey among experts in Europe, North America and Australia was used for the study. Based on the findings recommendations are made for the Dutch situation, focussing on the preventive use by professional drivers and drivers with an alcohol problem.

Effects of roundabouts on road casualties in the Netherlands

T. Churchill, H. Stipdonk & F. Bijleveld, R-2010-21. 28 + 18 pp. € 11.25 (English).

This study evaluates the effects on road crash casualties and takes into consideration all crashes on all known roundabouts built in the Netherlands during the period of 1999 to 2005, not just a sample. Before and after crash and roundabout information is used and specific attention is paid to fatalities and (police reported) serious road injuries. The report also contains a cross-section comparison of road junctions and roundabouts.

Fact sheet updates

- The elderly and infrastructure
- Driver Training in Steps (DTS)
- Police enforcement and driving speed
- Contents and assessment of traffic education
- Whiplash
- Intelligent Transport systems (ITS) and road safety
- Mobility on Dutch roads