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SWOV
INSTITUTE FOR ROAD SAFETY RESEARCH

40 years improving road safety 2002

RESEARCH ACTIVITIES

Alcohol lock: European pilot study desirable

AN ALCOHOL INTERLOCK (BETTER KNOWN AS AN ALCOLOCK) MAY BE AN EFFECTIVE WAY OF GETTING PEOPLE WHO HAVE BEEN SENTENCED FOR DRIVING WHILE INTOXICATED (DWI) TO DRIVE SAFELY. THIS IS THE RESULT OF A RECENT EUROPEAN FEASIBILITY STUDY. THE STUDY SHOWS THAT THERE ARE SUFFICIENT REASONS TO CONDUCT A PILOT STUDY WITH ALCOHOL LOCKS IN THE EU. VARIOUS EUROPEAN COUNTRIES HAVE SHOWN INTEREST IN SUCH A PILOT STUDY.

An alcohol lock is a small device in the car with which a breathing test must be carried out before the car can be started. If the driver has drunk alcohol, the car cannot be started. The apparatus is well guarded against fraud. SWOV has led a consortium of the German research institute BASt, the Danish DTF, and the Finnish VTT to study whether a trial with an alcohol lock in the European Union makes sense (SWOV report D-2001-29).

The study consisted of a literature study of foreign experiences with alcohol locks,

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a short practical trial with a lock in Finland and the Netherlands, a survey of experiences and possibilities among European and non-European countries, and a workshop to measure the interest in an experiment in Europe.

The literature study showed that, from the results in Canada, the United States, and Australia, the installation of an alcohol lock makes sense as an alternative punishment for people whose driving licences would be withdrawn as a result of DWI. For people with an alcohol lock in their car, the chance of recidivism is about half compared with sentenced drivers with no alcohol lock in their car.

In Finland and the Netherlands a small, non-representative trial of alcohol locks was held. Quantified conclusions could not be made, but it was clear that good training before using the lock is necessary for safe use while driving.

The survey in European countries showed that in most countries, a change in the law is necessary to introduce the alcohol lock. Both the survey and the workshop showed that a number of countries were clearly interested in an experiment. Belgium, France, the United Kingdom, and the Netherlands indicated that participation in a European trial was a serious option. Spain, Finland, France, and the United Kingdom have already started preparations for their own experiment. They indicated their intention to conduct experiments that would be largely comparable to the European trial.

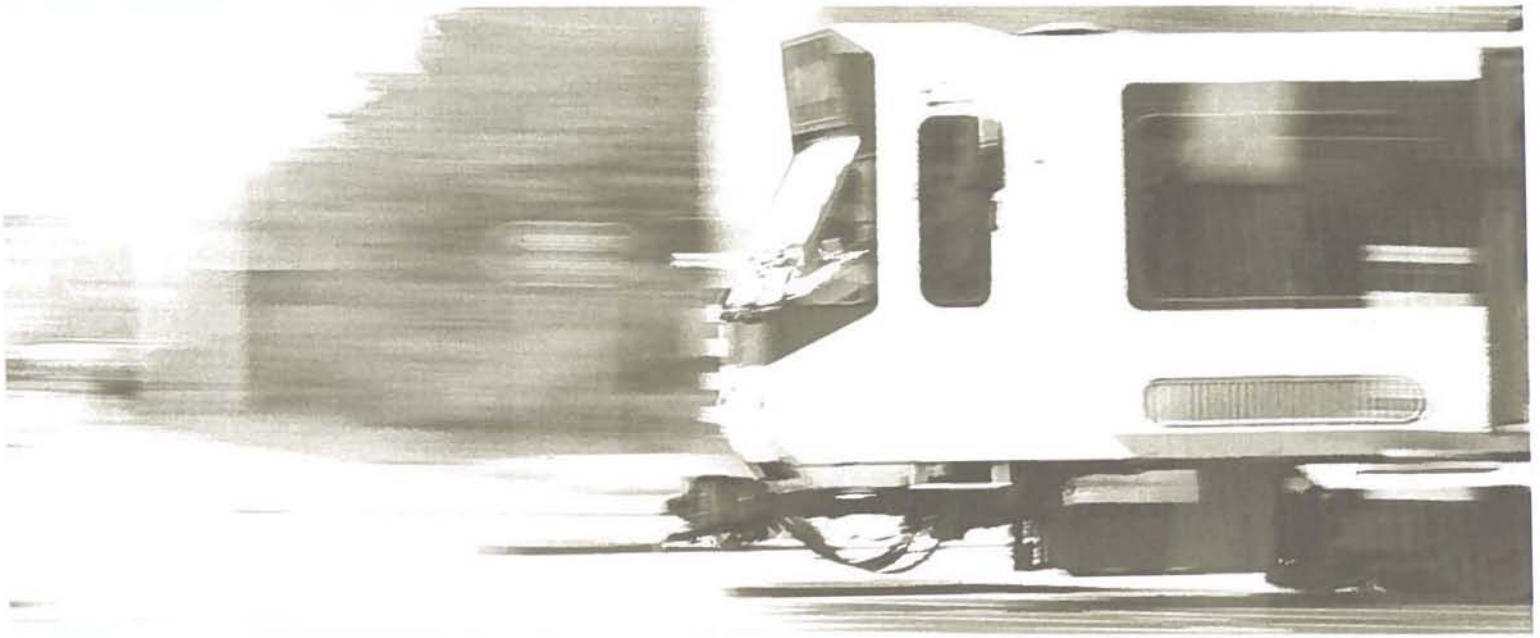
The report presents minimum requirements for a European trial. A trial is best carried out among offenders who are offered an alcohol lock as an alternative to licence suspension. Each country should have about 500 trial participants, with 1,000 DWI offenders acting as a control group. The control group must not be offered the alcohol lock as an alternative to licence suspension. In addition, professional drivers may constitute a good target group for an experiment. For this at least 100 participants are necessary.

The duration of the experiment among DWI offenders with an alcohol lock as an alternative to licence suspension, may vary depending on the duration of the licence suspension. A suspension of 3 months may, for example, be converted in a 6 months conditional suspension in combination with 18 months use of an alcohol lock. Use of an unconditional suspension, followed by use of an alcohol lock, should be reserved for very serious offences.

The European Commission has reacted enthusiastically to the report. It will be discussed in the High level Group Road Safety of the EU. This group will also discuss the way in which the report could be followed-up. Countries wishing to participate in a European trial may contact SWOV for further information.

From the start the Ministry of Transport in the Netherlands has shown interest in a trial, and the possibilities have been explored. However, inclusion of a so-called 'experiment article' in the Road Traffic Act is necessary before a trial can be carried out. Such an article can make an exception for research. The Ministry of Transport is making preparations for introducing such an article, so that an experiment can be started in the foreseeable future.

Does 'Light-Rail' fit in a Sustainably-Safe traffic system?



A RECENT SWOV STUDY LOOKED INTO THE SAFETY CONSEQUENCES OF A LIGHT-RAIL SYSTEM. THE TERM LIGHT-RAIL IS USED FOR PUBLIC TRANSPORT SYSTEMS THAT ARE HALF-WAY BETWEEN TRAIN AND (CITY) TRAM. FROM THE (PUBLIC) TRANSPORT POINT OF VIEW, THESE LIGHT-RAIL SYSTEMS COMBINE THE ADVANTAGES OF TRAIN AND TRAM.

High speeds are combined with short stop distances and a dense network, leading to an efficient access of large urban areas. However, such a mixture also combines the disadvantages of train and tram. From a road safety point of view, high speeds are difficult to reconcile with mixing with road traffic. In the Netherlands, since a number of years now, a lot has been invested in a Sustainably-Safe traffic system. In this, the traffic infrastructure, surroundings, and rules are tuned to the possibilities and limitations of road users. Everything is aimed at preventing accidents; should this prove to be unavoidable, then the accident severity must be limited. This means that for high speeds, traffic types and driving directions should be separated, and conflicts and crossing movements should be avoided. Mixing traffic types and the presence of (level) crossing movements is only acceptable if the driving speeds are low.

In the light-rail concept, there are fast moving rail vehicles (70 km/h or faster) that cross other traffic at the same or split level. Same-level crossings when driving fast are unacceptable in a Sustainably-Safe traffic system. Certainly, seeing the high speed and long braking distances of the rail vehicles, the possibility of anticipating conflicts are limited. Furthermore, because of the large mass of a rail vehicle, most of the resulting accidents will be serious.

The study concludes that a light-rail system can only be achieved in a Sustainably-Safe way if:

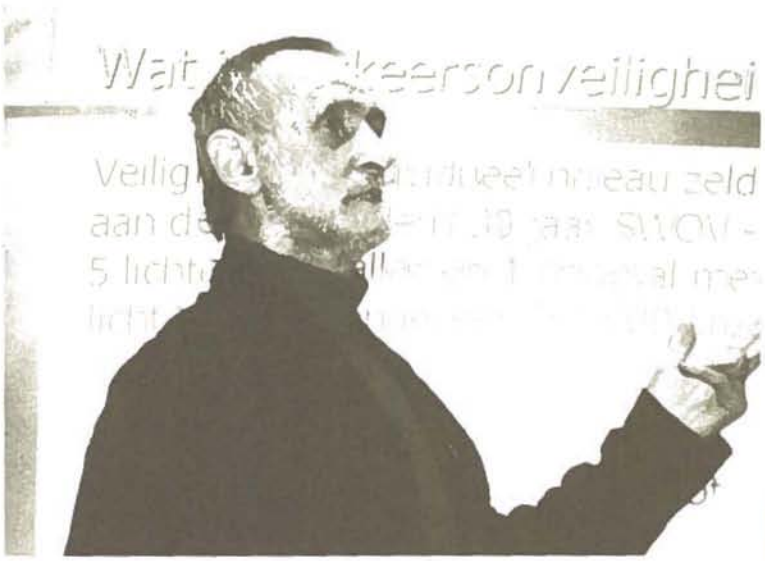
- there are low speeds on same-level crossings, or
- crossing traffic is separated (split-level or completely protected level crossings).

It should, anyway, be realised that experiences with existing protected level crossings in fast-tram routes show that accidents still occur; and they are nearly always severe. In addition, constructing a fully protected level crossing cannot be qualified as optimally Sustainably-Safe. Since both same-level crossings and high speeds are system features of light-rail systems, incorporation in a Sustainably-Safe traffic system will always remain a problem. Because considerable investments are intended in achieving a Sustainably-Safe traffic system as well as constructing Light-Rail projects, it is recommended that attention be paid to a safe incorporation of Light-Rail.

The study, that was commissioned by Amsterdam Public Transport, was initially and particularly intended to investigate the general safety of two planned (level) crossings in an extension of an existing fast-tram route. On these two planned crossings it appeared that the sight distances for both the rail vehicle and the crossing traffic was so limited that a safe completion of traffic manoeuvres was not possible, even with lower speeds of rail vehicles. This conclusion was the reason for a more general analysis of the compatibility of Light-Rail systems in a Sustainably-Safe road network.

Siem Oppe leaves SWOV

The 22nd of February 2002 was Siem Oppe's last day at SWOV. At his departure he gave a lecture in which he looked back on 30 years of road safety research. He dealt with a number of "strong personal feelings and experiences" that were presented in the slides included in these pages.



Siem Oppe operated as an expert in the field of statistical analysis and techniques. His work in this field has contributed to its great improvement and the fact that road safety research has become an independent (sub)discipline of science. During his career, Siem was involved in many international co-operations with various institutes, in and outside Europe. He was also a member of the Editorial Advisory Board of Accident Analysis and Prevention.

Siem Oppe graduated in experimental psychology and joined SWOV in 1972 as an employee in the field of methodology and research design. In this capacity he worked closely with the Data Theory Group of Leiden University. During the first half of his career Siem contributed to the application of advanced multi-variate analysis techniques in road safety research and the improvement of the methodology of conflict observations.

By using this analysis model, the developments of road deaths in motorised countries can be easily described by means of the gradual increase in motor vehicle kilometres and the decline in fatality risks. This model has gained international recognition. Apart from this, Siem dealt, among other things, with research management and he studied the effect of the introduction of the helicopter ambulance after serious accidents had occurred. His last large international project was the crash compatibility of vehicles. Siem is still going strong in long-distance speed cycling and skating.

Later, Siem made a large contribution to the use of time-series analysis as a model for road safety developments.

Highlights colloquium Siem Oppe

- Because of the low accident probability per kilometre travelled, fundamental research on traffic safety, taking the individual accident itself as object of study, is almost non-existent. 99% of safety research is based on accident records that do not contain essential information about precise manoeuvres, instantaneous circumstances, (indirectly) involved traffic participants, impact speed and angles etc. A consequence of this lack of fundamental information, knowledge and understanding is that traffic safety is primarily an engineering and not a scientific discipline (scientific in the sense of systematic observation of the object of concern).

- Explaining safety without considering exposure will often lead to erroneous results. Accident analysis at an aggregate level, however, is hampered by a lack of exposure data. This part of data collection should get more attention, especially because of its potential for safety improvement. E.g., in the Netherlands 40% of all motor vehicle kilometres is driven on the 10 times safer motorways, while in 1950 this was 5%. If this figure was still 5% now, more than 500 extra fatalities per year would be the result.

- Accident risk is often seen as a synonym for accident rate. The decision theoretic approach defines risk as 'expected loss' given a certain decision. The definition includes the number of events, the probability of a possible outcome for each event and the loss for each possible outcome. This more adequate definition of risk agrees with the fundamental basic concepts for traffic safety research and improvement in terms of exposure, danger and loss.

- Models for aggregate safety data, especially at the highest level, should include these three basic aspects: The number of accidents (of a certain type) = exposure x accident rate x loss. Safety is increased by regulation of exposure, reduction of danger and minimisation of serious loss in terms of fatalities and quality of life.

- Sustainable safety is primarily a matter of improved road design and traffic regulation. Shortcomings in design should be improved and not compensated by behavioural measures and education.

- The claim of safety improvements resulting from Telematics as developed in the last 20 years is unjustified. The largest potential safety measure, being dynamic speed adaptation, is still not implemented due to societal and political unwillingness. The introduction of compulsory dynamic speed delimiters is a necessary condition for sustainable safety.

- Statistical experts asked for advice are often more interested in the application of their latest developed models than in your safety problems.

- A statistical analysis should start with a conceptual analysis of the problem, followed by a sound methodology based on that conceptual analysis.

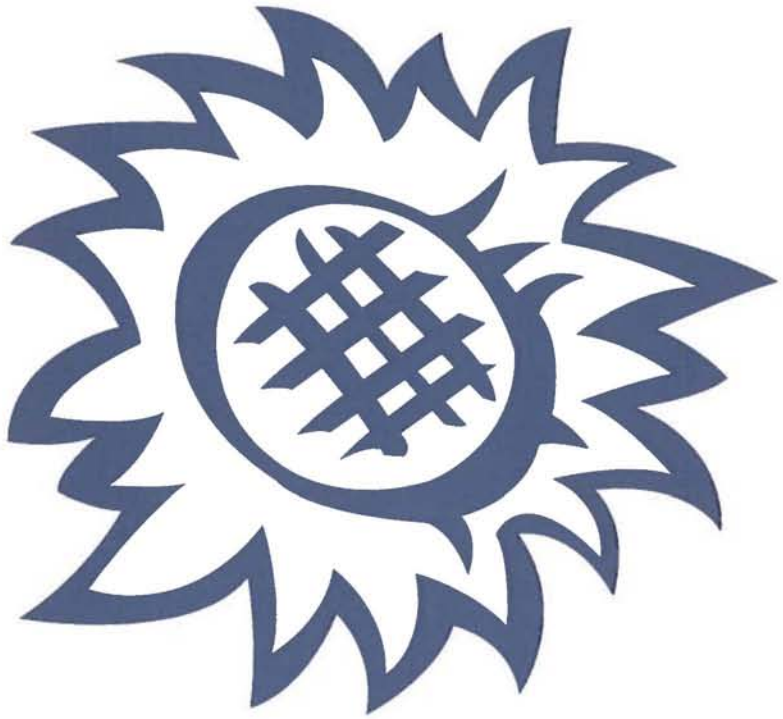
- The study of traffic and safety developments needs the application of time-series techniques and not just regression analysis.

- Non-linear techniques such as HOMALS and OVERALS (in SPSS) en TRANSREG (in SAS) deserve more attention.

- It turns out that in research practice the costs of data collection and manipulation (measured in time and money) often exceed the total project budget to such an extent, that proper data analysis, interpretation and reporting is almost impossible. Advice: do not collect data without a clear study design showing what data is needed and how this data will be analysed.

SUNflower Congress held 17 April in The Netherlands

SUNflower is the European research project on the road safety achievements in Sweden, the United Kingdom, and the Netherlands, the three EU countries which, together with Norway, have the safest road traffic in the world when expressed in fatality risk per number of motor vehicles or inhabitants. The research project is sponsored by DG-TREN of the Commission of European Union and carried by SWOV (Netherlands), TRL (UK), and VTI (Sweden).



The SUN countries obviously have differences and similarities in their road traffic developments, transport cultures, road infrastructures, and policies. The main questions to be answered by the SUNflower project are:

- *'Can the SUN countries, being different and still almost equally successful, learn from each other how to become safer?'*

and, important for the EU in order to meet its target of 50% road traffic fatality reduction by 2010:

- *'Can other countries learn from the road safety achievements of the SUN countries?'*

as well as before answering these questions:

- *'Which methodology is to be used for meaningful comparisons between the SUN countries and other countries?'*

At the SUNflower congress in April the preliminary results were presented to participants of 18 countries, including many research colleagues from Europe. A congress on the preliminary results of an unfinished research project, so we learned from the SUNflower congress, has the advantage that the research conclusions can still be influenced by those present. The same effect is to be expected from the lively discussions on the presented subjects (a Portugese asked: *"What relevance there is for MOONflower countries?"* and a Czech: *"Do foreigners in the UK contribute to the British risks, since over there the Britons drive on the wrong side of the road?"*) and the critical remarks of the SUNflower advisor panel (members of ETSC, OECD Transport Steering Committee, DG TREN, and MoT's of SUN countries) during the SUNflower congress.

After the congress was opened by *Dimitrios Theologitis* (DG-TREN, European Commission) who stressed in his address that 2001 has been the first year where the EU had less than 40,000 road traffic fatalities, speakers from each of the SUNflower countries presented a variety of topics. Matthijs Koornstra (SWOV), David Lynam (TRL), Göran Nilsson (VTI), Piet Noordzij (SWOV), Hans-Erik Pettersson (VTI) and chairman of the congress Fred Wegman (SWOV) spoke on a variety of subjects, ranging from drink-driving and use of seatbelts to infrastructural engineering.

Wegman pointed out that different registration and reporting practices which are present, even in the SUN countries, made the analyses more complex and time consuming than expected, and asked the utmost of the research capabilities in SWOV, TRL, and VTI.

An overview on the SUN comparison of road user risks in 2000 showed that the death rates for car occupants are the lowest in the UK and the highest in Sweden and for vulnerable road users they are the highest in the UK and the lowest in the Netherlands. Reasons for these differences could not be given but could they be explained by national differences in culture and background?

Richard Allsop (London University), took the role of the critical commentator as delegate of the ETSC, and discussed points that future progress has to realise.

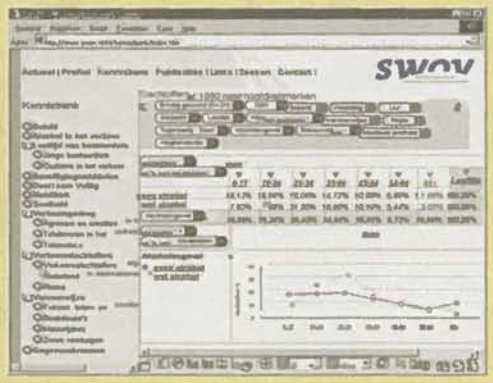
The final SUNflower research report is scheduled to be available in Autumn 2002. Read what it contains when it is published in September, it will then also be available on the SWOV website.

SWOV Prize awarded

To celebrate the fact that SWOV was founded 40 years ago, the SWOV Research Prize was created. During the National Road Safety Congress, the 1st prize was awarded to Isabel Elias and Tjaco van den Berg for their research proposal "Life-saving Support". In the next two years this proposal will be carried out by SWOV. The 2nd prize went to Corné Versteegt for his research proposal "To the ATS-Lab". The 3rd prize was for Viktor Hooijmeijer and Paul van de Bosch for their proposal "Effects of Variable Brake Light Intensities". The prizes were awarded by Mr. F.W.C. Castricum, the chairman of SWOV's board of governors.

The winning proposal "Life-saving Support" concerns a study of the political support for the introduction of a system of Intelligent Speed Adaptation (ISA). The study is aimed at those aspects that play a role in creating political support. The jury regarded this as a well-founded proposal about an extremely relevant social problem. The results will produce interesting points of view for obtaining support for new road safety developments. Moreover, the study can easily be carried out within the two years allotted.

The SWOV Website - thé online information source for road safety - completely renewed



During the last year, SWOV has devoted a great deal of time and energy to compiling a renewed and improved web site. The renewal of the Dutch-language web site was finished in April; the English-language version will be completed this summer, but can - in the meantime - be consulted as usual.
All relevant scientific knowledge about road safety problems is offered in an orderly fashion and is built on data from databases such as Accidents, Population, IRTAD, the National Travel Survey (NTS), Vehicle Numbers etc. What is new is the possibility of generating cross tables and graphs from the databases and to design them to suit one's own preferences and wishes.

In addition, the web site contains:
- the latest news about SWOV,
- all articles in Research Activities,
- a world-wide list of congresses about road safety subjects,
- an interactive quiz to measure your own road safety knowledge,
- a detailed, expanding, online library catalogue with 55,000 titles,
- all SWOV reports since 1962 (its foundation year),
- the possibility of examining SWOV reports since 2000 for free and downloading them,
- dozens of links to other national and international road safety organisations,
- various search possibilities.

Visit the SWOV web site soon, **www.swov.nl** the first information source to consult on your search for road safety information.

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. Reports can be obtained by completing the SWOV order form that can either be found on the website, or that can be sent to you by the Department of Information and Communication (info@swov.nl). The price of each report (in euros) is given in the following list, as well as the language in which the report is written. Reports can be paid by credit card. For bank transfers, we will charge an extra € 7,- per transfer. After SWOV has received your payment, the reports will be sent to you by mail. 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.

Two-wheeler accidents
Analysis of accident, injury and exposure data to determine research priorities. LT.B. van Kampen & C.C. Schoon. R-2002-5. 40+36 pp. € 12,50 (in Dutch)

Safer roads in Chad (in French: Risques réduits sur les routes du Tchad)
Recommendations for low-cost road safety measures in Chad. Jan van der Sluis. R-2002-7E (in French R-2002-7F). 22+23 pp. € 11,25 (in English or French)

Road design elements taking the older user into account
A literature study. R.J. Davidse. R-2002-8. 50 pp. € 11,25 (in Dutch)

The position of the express tram within a sustainably-safe traffic system
Safety test of the extension of the Amstelveen Line. T. Hummel. R-2002-9. 18 pp. € 7,50 (in Dutch)

Development of driving skills of young moped riders
Ch. Goldenbeld, S. Houwing & S. de Craen. R-2002-10; 36+28 pp; € 12,50 (in Dutch)

Practical research of access systems of residential areas
The influence of the number of connection directions on the journey length. J. Minnen & J. Krabbenbos. R-2002-11. 28 +11 pp. € 10,- (in Dutch)

The uses of exposure and risk in road safety studies
A.S. Hakkert & L. Braimaister. R-2002-12. 53 pp. € 11,25 (in English)

Extra information on Dynamic Message Signs: possibilities and effects
S. de Craen & drs. M. de Niet, R-2002-13. 36 + 1 pp. € 10,- (in Dutch)

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ROAD SAFETY RESEARCH

Colophon

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Publisher
SWOV Institute for Road Safety Research
PO Box 1090, 2260 BB Leidschendam, The Netherlands
T + 31 703173333
F + 31 703201261
E info@swov.nl
I www.swov.nl

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SWOV Institute for Road Safety Research
PO Box 1090
2260 BB Leidschendam
Duindoorn 32
2262 AR Leidschendam
The Netherlands
T + 31 703173333
F + 31 703201261
E info@swov.nl
I www.swov.nl