The SWOV Institute for Road Safety Research in 1994

International experiences in brief

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1. The SWOV Institute for Road Safety Research

1.1. Introduction

The SWOV Institute for Road Safety Research, located in Leidschendam, near The Hague, is a private organization and the centre point for road safety research in the Netherlands. SWOV was founded in 1962 as a result of a joint initiative by the Minister of Transport and private organisations.
The aim of the SWOV, then and now, is to offer a contribution towards improving road safety by means of scientific research and consultancy.
SWOV has a staff of seventy people, among them forty researchers.
In the 32 years since its foundation, the SWOV has conducted or commissioned numerous studies, published over one thousand papers and organised meetings and many conferences.

1.2. Objectives

SWOV's goal is to contribute to road safety by means of scientific research, consultancy and dissemination of knowledge. From the list drawn up by DG VII on fields of specialization, SWOV has built up an experience in: road safety, infrastructure, telematic systems applied to transport, transport statistics, legal aspects, traffic management and control.

SWOV is in command of road safety knowledge for The Netherlands, helps the Ministry of Transport to design research projects and carries out scientific research itself. The work applies to the international and national, as well as to the regional level.

The tasks of the SWOV can be described as follows:
- to initiate and create research policies
- fundamental theoretical research
- anticipating research
- policy evaluation research
- policy supporting research
- consultancy
- research coordination.

Its activities cover all aspects and areas of road safety. To give an idea of in which activities SWOV is involved, we herewith list as an example some of the items. In the annex you will find a list of SWOV-reports, publications, contributions and articles published in the years 1985-1993, in a different language than Dutch.

- accident registration
- black spots
- collisions and simulations
- conflict methods
- daytime running lights
- drink/driving
- driver training and young drivers
- education

- heavy goods vehicles
- helmets
- injury prevention
- lighting and visibility
- medicines
- obstacles in verges
- police enforcement
- reconstruction of urban areas
- roundabouts
- seat belts
- speed
- traffic behaviour
- traffic flow models
- tires, road surfaces and accidents involving skidding
- vulnerable road users like children, elderly, pedestrians and cyclists
- weather conditions.

The results and know-how are spread among policy making bodies, scientists -in order to exchange research results and methods- and institutions and persons charged with road safety.
Aside from activities in the field of research, the SWOV is also commissioned with the transfer and diffusion of knowledge, data and experiences in the field of road safety, both at national and international level.

1.3. Philosophy

The SWOV looks at road safety through the functioning of the transport system in its entirety. This means that study into road safety demands an interdisciplinary approach. The solutions to various problems and specific aspects will also be considered in relation to each other, and require an insight into the technical, psychological, sociological and economic aspects of the transport system and the way in which these factors are linked. This can only be achieved with the aid of systematic data processing of traffic and accident processes. Highly advanced analysis techniques are essential to ensure the success of this interdisciplinary approach. The use of the computer as well as the development of mathematical models for traffic and accident processes for this type of study are of vital importance.

1.4. Some features of SWOV

1.4.1. *Sustainable safe traffic system*

The SWOV Institute for Road Safety Research has developed in cooperation with a number of Dutch research institutes in the National Road Safety Investigation 1990-2010 a new concept: a sustainable safe road traffic system, because it was expected that the intensification of current policy will be insufficient to realise the road safety targets.
Such a system has an infrastructure that is adapted to the limitations of human capacity through a conflict minimizing design of the network of arterial and rural roads and motorways, vehicles fitted with ways to simplify the tasks of man and constructed to protect the vulnerable human being and a road user who is adequately educated, informed and, where

necessary, controlled. We suggest a gradual implementation over a period of 30 years.

1.4.2. *Computer simulation programme*

In 1970 SWOV began collaborating with Professor V. Giavotto, Professor of Aircraft Design at the University of Milan, on a computer model, the forerunner of VEDYAC. With this model over 1,000 simulations were carried out with the aim of improving the safety barriers. With the experience thus gained a new model was developed, one which has greater flexibility and versatility: VEDYAC. VEDYAC stands for Vehicle Dynamics and Crash Dynamics, a flexible computer model which is able to compute and display movements of bodies in space and what happens when they collide. VEDYAC is able to simulate all sorts of manoeuvres and collisions, not only real-life traffic situations but even situations that exist only on the drawing board, for which full-scale crash tests are not feasible.

1.4.3. *Documentation/Library*

One of SWOV's services is an open large road safety library, containing also an extensive collection of 'grey' literature and semi-official published reports and other documentation. SWOV is the co-ordinating centre in the Netherlands of the International Road Research Documentation (IRRD) system, which is organised by the Organisation for Economic Co-operation and Development OECD. IRRD is a modern, easily accessible, computerized reference system containing abstracts and other bibliographic details on publications as well as current research from around the world of interest to road and road transport research. The aim of IRRD is to collect and disseminate all information of interest to researchers, engineers, managers, policy makers, practitioners, educators and others working in the field of roads and road transport.

1.4.4. *Congresses/courses*

SWOV workers are frequently visiting and giving presentations on high level scientific congresses, seminars, workshops, etc. Our expertise and experience is recognized throughout the world.
Apart from giving lectures, we also write articles in international scientific journals and many people from abroad come to visit our institute.
A part of the TREND course for traffic engineers from developing countries of the Delft University of Technology is taken care of by the SWOV. Exchange of knowledge and information also takes place in various commissions, like PIARC, PTRC, OECD.

1.5. Clients

Aside from work commissioned by the Dutch Ministry of Transport, the SWOV is increasingly receiving assignments by the European Union plus via regional and municipal governments, private organisations and industry. Studies are also requested by organizations overseas. Over the years, the SWOV has evolved increasingly towards a market-oriented institute, actively acquiring assignments.

2. International previous experience with the EC, various countries and international organizations since 1985

In the over 30 years of existence SWOV has worked on a large variety of road safety research projects. Although the contracts from the Dutch Ministry of Transport, Public Works and Watermanagement still forms the biggest part of the portfolio, SWOV is more and more active on the international market. Here below we give a brief overview of our international experience.

2.1. European Commission

SWOV participated respectively participates in three EC-technology projects in the DRIVE-framework i.e. in DRIVE I: PUSSYCATS and in DRIVE II: HOPES and SAMOVAR, and executed or participated in other EC-projects on road safety.

2.1.1. *PUSSYCATS*

Two of the DRIVE I projects aimed at pedestrians. PUSSYCATS was about the development of a new kind of pedestrian crossing. In the experiment use was being made of a detection mat and infrared detectors.
In a joint project with French and English participants the behaviour of pedestrians at four locations was investigated. SWOV wrote two reports in English on this subject; one describes the Dutch evaluation research, the other compares the evaluations in the three countries.

2.1.2. *HOPES*

In DRIVE II the evaluation of traffic safety effects of the developed telematica systems will be a main concern. The HOPES project is to give support to projects in their evaluations. In 1992, the first year of the project, several guidelines were developed both for human-machine-interaction and safety. These guidelines give an introduction to the concepts and the various methods and techniques to be used and give examples of application of these techniques. SWOV took responsibility for the following deliverables:
- Guidelines for retrospective safety analysis;
- Application of tools for retrospective safety analysis to ATT-systems in DRIVE II.

In 1993 instructions and support will be given to the DRIVE II projects as to planning and execution of their evaluation-study. Furthermore the DRIVE relevant safety issues will be evaluated on the most.

2.1 3. *SAMOVAR*

Fundamental aim of this research project is to determine whether the automatic registration of a number of data and the knowledge gained by that will increase road safety. The recordings regard vehicle data, such as speeds, decelerations and accelerations, driver behaviour and the road circumstances. In 1992 a proposal has been made for a study design. Research partners are from Great Britain, Germany and Greece. SWOV interests are in practical possibilities and methods to determine whether

recording driver behaviour by in-car telematica systems will have a beneficial effect on driver behaviour, and by that on road safety.

2.1.4. *Utilisation of Security Helmets for Two-wheeled Vehicle Riders*

At the request of the EC in 1990, SWOV made a study with the purpose to give a description of the state of the art in the member states of the EC concerning the legislation and the use of helmets by two-wheeler drivers and passengers in road traffic. Also the requirements to be met by helmets per country were taken into consideration.
Scientific reports (medical and biomechanical) were being studied from the member states of the EC and some other countries on injuries due to traffic accidents of drivers and passengers of two-wheelers, divided into users and non-users of helmets.

2.1.5. *High Level Expert Group for an European Policy for Road Safety*

In 1990/1991 SWOV took part in a committee of experts whose job was to draw up a report on the state of affairs of road safety throughout the member states of the European Community, and to make proposals with a view to improving the situation.
After reviewing the overall situation in the so called "Gerondeau-report", the Committee first set about compiling a list of the various (60!) measures which attribute to the overall objective. Secondly the Committee determined the ways through which the EC could contribute to the setting up of efficient road safety policies on the totality of the Community territory. This can be done by means of binding directives as well as by advisory activities and the setting up of a specialised permanent Community body with well described tasks to monitor and sustain road safety.

2.1.6. *International Committee for DRL*

In 1990 SWOV was asked to set up an International Committee for Daytime Running Lights, consisting primarily of research experts. The EC provided financial support to install this Committee and also meeting facilities in Brussels. The first task of the Committee was to review and evaluate existing evidence on the effectiveness of DRL and to review and evaluate the design and results of new research on DRL, especially in the Netherlands, Denmark, Canada and Austria.

2.1.7. *SARTRE-survey*

In 1991/1992 the SARTRE-Consortium, the forerunner of FERSI, carried out a survey in 15 European countries, on the social attitudes to road traffic risk in Europe, financed by the EC and national funds. SWOV not only covered the national survey and analysis, but also is responsible for parts of the comparative international analysis and the soon to be published report on that matter.

2.1.8. *International Research on Safety Effects of Road Design Standards*

In 1993 the SWOV is requested as main contractor to draw an inventory of existing knowledge on design of all elements of road infrastructure, to analyze the role road safety has played when fixing the existing road design standards and to draw a best practice out of all that information.

Subcontractors of this project are located in Ireland, Great Britain, Denmark and Germany.

2.1.9. *Road Safety Impact Assessment (RIA)*

At the end of 1993 SWOV was asked to formulate a proposal for an outline of Road Safety Assessment (RIA).
SWOV will investigate whether the philosophy and structure of Environmental Impact Assessment reports (EIAs) which are already used and the experience now gained with such reports, can be used for translation into RIAs.
The study will collect backgrounds and experiences from different member states and will formulate a proposal for possible future harmonisation on RIA and for a procedure which EU can use as an instrument in decision-making processes on infrastructural projects.

2.2. EU-countries

2.2.1. *Classified study*

By order of a German company the SWOV investigated as from 1990 the effect of a number of road side safety structures by collision with a heavy vehicle with high speed.

2.2.2. *SINA*

In 1986 the Società Iniziative Nazionali Autostradali "SINA S.p.A." amongst others in Italy requested the SWOV to survey and assess the many types of safety barriers which have been developed for motorways in recent years in various countries. The data on the various types of barriers were taken from the literature. A few of the results with certain types of safety barriers reported on derived from mathematical simulations, by using the VEDYAC (Vehicle Dynamics and Crash Dynamics) computerprogramme.

2.2.3. *TRL*

By order of the Transport Research Laboratory in Great Britain in 1988, SWOV made a review of the German literature of the subject of Individual Differences and Accident Liability. Part of the project was carried out by two other Dutch research institutes.

2.2.4. *COBA*

In 1989 the Portuguese Ministry of Roads wanted to take safety measures on the most unsafe road in Portugal: the connection between Lisbon and Cascais along the coast. COBA was invited to study the traffic volume, the speed and the accidents on this road. COBA invited SWOV to act as consultants in the accident studies and in the determination of the measures to be taken.

2.3. Central and Eastern Europe

2.3.1. *Hungary*

The Hungarian Ministry of Transport in 1993 commissioned SWOV with a consult on a point demerit system. On the basis of the outcome of a workshop held in Budapest, in which also the Dutch Ministry of Transport took part, SWOV formulated recommendations for the implementation of such a system.

2.3.2. *General*

As from 1992 SWOV is building up relationships in particularly Russia, Hungary, the Czech Republic, Slowakia, Poland. The organizations involved are sister-institutes, technical universities or ministries of transport. We paid visits to and fro. With some of the institutes or universities we have signed a Memorandum of Understanding in which we express our interest for mutual cooperation.
In co-operation with a panel from the CEEC, SWOV designed a framework for a "Low-cost engineering manual". The tackling of the so called "black spots" will be a cost effective approach for these countries to reduce the number of road accidents.

2.4. Other

2.4.1. *Classified studies*

In 1985 an European company asked SWOV to give advice on road safety issues in a desert country. A study was carried out on roll-over accidents. Advice was given in the safety of additional installed fuel tanks, fitting of seat belts in buses for passengers and the effectiveness of existing roll-over protection. Furthermore a review was made on the drivers' skills and driving attitude.

In 1987 SWOV took part on a road safety audit in an African country. The Safety Committee of a European company produced a Guide on Road Safety Management. SWOV was asked to look at the cultural aspects, ways to make the guide better applicable to the local circumstances and to comment on the contents of the guide.

2.4.2. *Cuba*

In 1993 the Cuban Ministry of Interior Affairs asked the Dutch Ministry of Transport for a consult on the bicycle policy. SWOV acted as subcontractor and gave advice on instruction, education, enforcement and information for cyclists.

2.4.3. *Worldbank*

Aim of a road safety seminar on 14-15 December 1992 in Washington was to develop and disseminate relevant guidelines for implementation of road safety measures in on-going Bank projects. SWOV contributed with lectures on improving road safety for vulnerable road users and legislation, regulation and enforcement to improve road safety in developing countries.

2.4.4. *United Nations*

At the request of the Working Party on Road Traffic Safety of the Transport Division, SWOV made a proposal for the setting up of an information system on "Who is who in road safety". A decision is postponed.

Together with the Beijing Research Institute of Traffic Engineering, the Department for Development Support and Management Services of the United Nations is organizing a seminar on bicycle safety, planning and design for Chinese cities in April 1994. SWOV will contribute with two lectures on the design and the planning of bicycle facilities.

2.4.5. *OECD*

As from the beginning SWOV has on behalf of the Dutch government a representative in Steering Committee of the Road Transport Research (RTR) programme of the Organisation for Economic Co-operation and Development.
The programme has two main fields of activities:
- International research and policy assessment of road and road transport issues to provide scientific support for decisions by member governments and international governmental organisations;
- Technology transfer and information exchange through two databases - the International Road Research Documentation (IRRD) scheme and the International Road Traffic and Accident Database (IRTAD).

These activities are conducted by or in the form of scientific expert groups, research workshops, seminars, symposia and conferences as well as joint research projects.
SWOV participates in both mentioned databases as well as in numerous scientific expert groups, workshops, joint research programmes, etc.
Over the 26 years of the RTR-programme SWOV has chaired about 20% of the expert groups on road safety.

2.4.6. *FERSI*

On initiative of a.o. SWOV a Forum of European Road Safety Research Institutes (FERSI) was inaugurated in March 1991. The mission of FERSI is to provide research-based scientific input to the road safety policies and practices of inter-governmental bodies and central and local governments in Europe, as well as to promote closer collaboration between the European Institutes undertaking research into road safety. FERSI members agreed upon a tentative programme of cooperative research. In total 10 research projects are described. SWOV is leading partner for one project. Execution of the projects depends very much on EC funds and the launching of the EURET II-programme.

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SWOV
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Research

TARIFFS 1994

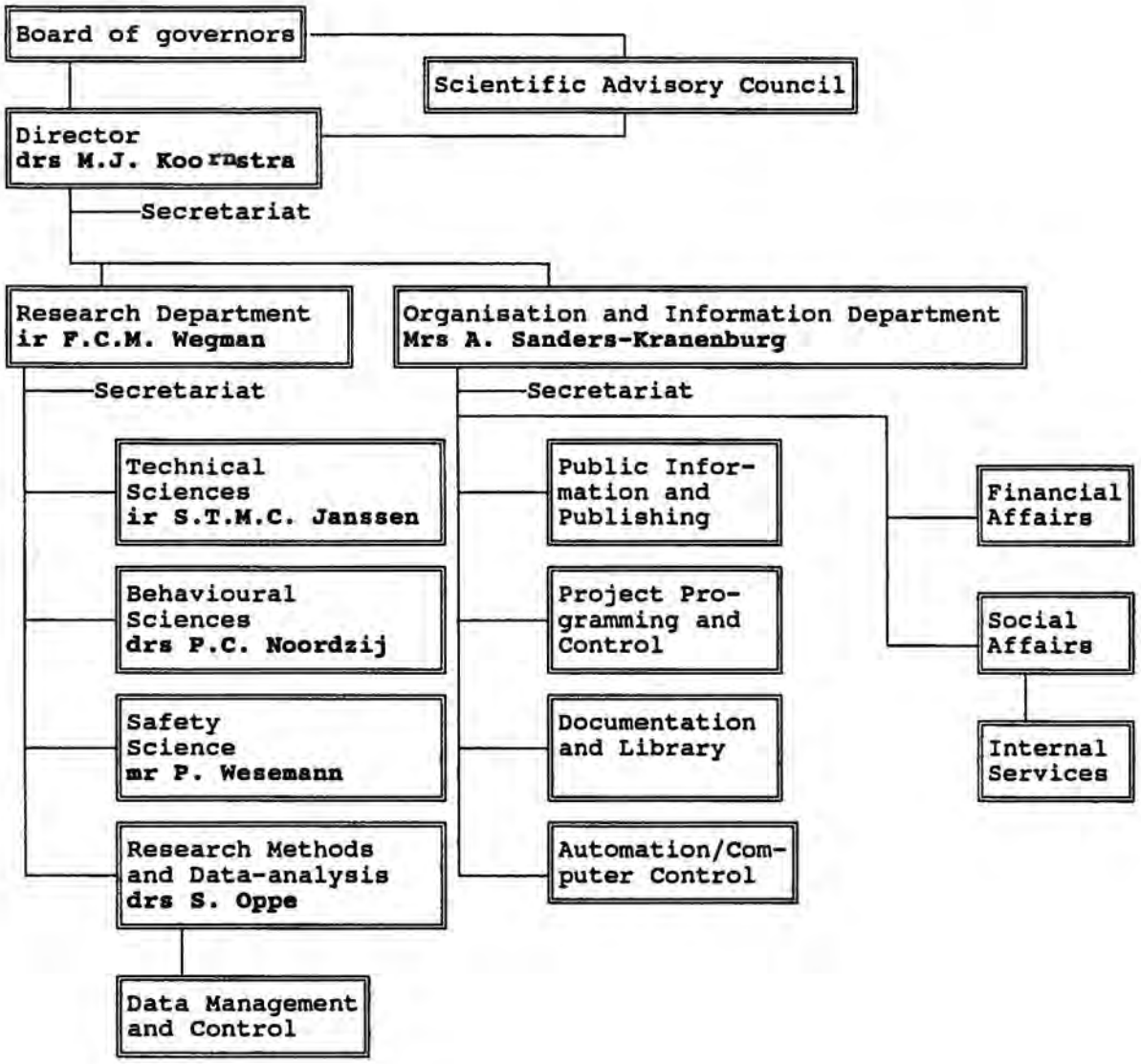
For Orders of Government/(Public) Authorities

Tariff group	Function level	DFL p/My * ECU p/My	DFL p/Md * ECU p/Md	DFL p/Mh * ECU p/Mh
I	Senior Researcher	DFL 309.690 ECU 142.845	DFL 1.940 ECU 895	DFL 243 ECU 112
II	Researcher	DFL 239.780 ECU 110.600	DFL 1.500 ECU 690	DFL 187 ECU 86
III	Junior Researcher	DFL 190.080 ECU 87.675	DFL 1.190 ECU 550	DFL 149 ECU 69
IV	Research Assistent	DFL 152.870 ECU 70.510	DFL 950 ECU 440	DFL 119 ECU 55
V	Research Support	DFL 111.990 ECU 51.655	DFL 700 ECU 320	DFL 88 ECU 40
Average		DFL 218.620 ECU 100.840	DFL 1.366 ECU 630	DFL 171 ECU 79

* VAT exclusive

DFL tariffs are fixed, due to possible exchange rate differences ECU tariffs are indicative.
Exchange rate 23-3-1994: ECU 1 = DFL 2,1680

Organisation of SWOV Institute for Road Safety Research, The Netherlands



Curricula vitae

Drs M.J. Koornstra (1941), director, studied psychology at the University of Leiden. From 1966 on he worked as researcher at the department of Evolution and Personality Psychology at this university. From 1971 till 1978 he worked for the department of Datatheory of the same university and was as the same time counsellor of SWOV. During the years 1978-1986 he was (crown)member of the course of lectures in Leiden. Since 1986 he is director of SWOV.

Ir F.C.M. Wegman (1948), research director, studied civil engineering at the Technical University of Delft and graduated in traffic engineering. From 1974 till 1977 he worked for the municipal of Amsterdam as road safety coordinator and researcher of the Traffic Bureau of the town clerk's department. Since 1977 he works for SWOV on subjects like road safety in cities and villages and the relation between research and policy in many fields.

Mrs A. Sanders-Kranenburg (1946), general management, studied psychology for one year and did a doctoral study (not an exam) in sociology, methods and techniques. She started her career as a sports teacher at secondary schools. In 1967 she came to work as part-time research assistant at SWOV. From 1975 untill 1986 she worked as a management staff member to the director. In 1986 she became head of the departement for programming and public affairs and at the same time member of the managementteam. Since 1991 she is head of all the supporting staff departments of SWOV.

Ir S.T.M.C. Janssen (1945), research manager, studied civil engineering at the Technical University of Delft and graduated in traffic engineering. Since 1972 he works at SWOV in the field of road infrastructure, especially the categorization of roads.

Drs P.C. Noordzij (1942), research manager, studied psychology at the University of Amsterdam. As from 1968 he was researcher at SWOV, commissioned with drink/driving, traffic rules and enforcement and the safety of cyclists and moped drivers. From 1981 till 1987 he worked as coordinator of research projects for the Faculty of Social Sciences at the University of Leiden. Since 1987 he works for SWOV again.

Drs S. Oppe (1937), research manager, studied psychology at the University of Leiden. From 1969 till 1972 he worked there in the field of experimental psychology. As from 1972 he works for SWOV on methods and (statistical) techniques for research, traffic behaviour - like conflict and risk analysis - and the design of models for the prediction of traffic accidents and mobility.

Mr P. Wesemann (1947), research manager, studied Dutch law at the Erasmus University in Rotterdam and graduated in criminology. From 1970 till 1977 he was a researcher in criminal law and criminology at this university. Since 1977 he works for SWOV on traffic legislation, police enforcement, drink/driving, speed behaviour and traffic education.