

SWOV Institute for Road Safety Research

The following article is part of an occasional series appearing in *TR News* that profiles transportation research organizations. The organization and goals of the SWOV Institute for Road Safety Research are discussed here.

Approximately one million traffic accidents occur in The Netherlands each year, killing about 1,400 and injuring more than 50,000 persons. The economic loss caused by these episodes totals about 6 billion guilders, or about 3.5 billion U.S. dollars. Both the loss of human lives and economic considerations make it imperative that solutions to highway safety problems be found.

The SWOV (Stichting Wetenschappelijk Onderzoek Verkeersveiligheid) Institute for Road Safety Research was founded in 1962 to address this major concern and to bring the benefits of scientific research to bear on highway safety. Created by the initiative of the Minister of Transport, the Royal Dutch Touring Club, the Netherlands Association for Automobile Insurance, and the Netherlands Association for Bicycle and Automobile Industry, SWOV's activities cover all aspects and areas of safety on the highways. The organization has a staff of 70, of which 40 are engaged in research, 15 support the research, and 15 serve as administrative personnel.



SWOV Institute's research seeks ways to avoid "critical situations" that can lead to traffic accidents.



Police conduct random breath testing to reduce number of drunk drivers on the highway.

SWOV Philosophy

From the start, SWOV has vigorously contested the notion of the inevitability of unsafe highways. The institute rejected the idea that highway safety problems could be solved by continually searching for isolated solutions to various problems. Instead, SWOV's approach has been to look for a combination of explanations from within a dynamic systems approach.

The organization supports the belief that to enhance traffic safety, the functioning of the entire traffic and transport system must be improved. This requires insight into the interplay of highway users and other factors of the system, such as roads, vehicles, and surroundings—the so-called “critical situations” that lead to traffic accidents. What matters is the detection and reduction of such critical situations.

SWOV seeks to combine different branches of science in its operations by encouraging close cooperation among members of the various disciplines: psychologists, sociologists, physicists, and engineers. The organization attempts to realize its aims in cooperation with associated institutes. Thus SWOV plays a coordinating role in planning road safety research in The Netherlands.

According to the institute, a comprehensive approach to transportation safety is possible only by studying systematically collected traffic and accident data with advanced analysis techniques. The use of computerized models to analyze data is of vital importance to such investigations.

SWOV Activities

Dissemination

The results of SWOV's research are disseminated among various groups: scientists, to facilitate exchange of research results and methods; policy makers, who are in a position to put the results into practice; and institutions and other interested parties, who can further the concerns of road safety. SWOV publishes its reports in Dutch, but they are sometimes translated into English, German, and French.

The organization has an extensive computer-based road safety library, facilitating speedy search for specialized infor-

mation. The Institute is the coordinating center in the Netherlands of the International Road Research Documentation (IRRD) system, which is administered by the Organisation for Economic Cooperation and Development. IRRD is a data base containing abstracts on publications and current international research of interest to road and road transport researchers. TRB is also a participant in IRRD.

SWOV also publishes a quarterly journal in Dutch, called *SWOVschrift* (SWOVscript), which has a circulation of 5,000 and contains summaries of research carried out by the institute and reports of its activities. Every two years, a two-day national congress is held on road safety.

VEDYAC Program

Another noteworthy project is the VEDYAC (vehicle dynamics and crash dynamics) crash simulation program that computes and displays trajectories and the results of collisions between moving objects. VEDYAC permits simulation of all kinds of maneuvers and collisions, not only those likely to happen in real-life traffic situations, but also potential movements and crashes for which full-scale testing is not feasible.

Medium-Term Road Safety Research Plan

The institute draws up a Medium-Term Road Safety Research Plan for four-year periods that covers the framework considered appropriate for road safety research during that period. The priorities selected are based on a combination of considerations: relevance to government policy, social feasibility, potential for improving road safety, and scientific value.

Without such a plan, problems can be approached from too many viewpoints, and there is the risk of project overlap, with resultant duplication of work. Such a fragmented system, which lacks any clear research strategy, cannot provide the information needed to optimize the transport and traffic process and measures required to improve road safety. If gaps in knowledge are to be filled, it is essential to concentrate on the quality of research. Careful planning provides a sound basis from which to choose priorities in traffic, transport, and road safety policies.

The Medium-Term Road Safety Research plan for 1989–1992 sets out both short- and long-term objectives. The main short-term aims are to support and evaluate specific policies, with particular reference to



Pedestrians negotiate snowy street in The Hague.

the Ministry of Transport and Public Works' Medium-Term Road Safety Plan for 1989–1993. The long-term goal is to expand and improve ways of controlling traffic and road safety.

The Research Plan is composed of eight research projects, of which two are directly connected with the implementation of the Medium-Term Road Safety Plan. Another five are concerned with long-term objectives, but also incorporate certain elements from the Ministry's Plan, and one stands alone.

- **Medium-Term Road Safety Plan Support**—involves support for, and periodic evaluation of, measures connected with the Ministry's Plan. Emphasis is on drunk driving, speeding drivers, and use of seat belts and crash helmets.

- **Conditions for Participation in Traffic**—consists of review of the system of driving instruction and testing, including development of a provisional driving license, course of instruction for moped riders, and drafting of a highway code, as well as influence of lifestyle changes and experience on safe behavior. (Connected with the Ministry's plan.)

- **Basic Data for Research and Policy**—concerned with the accessibility by computer of linked data banks. No objectives of its own, but designed to serve other projects in the plan, and additional projects and activities of SWOV and other groups.

- **Mobility and Road Safety**—traffic and road safety problems have developed more



Matthijs J. Koornstra, director of SWOV Institute for Road Safety Research.

or less independently. Following formulation of a road safety target, an unexpectedly sharp rise in mobility resulted in a rise in road accident casualties. Research is needed to gain understanding of the interrelationships among these developments. Focuses on models for forecasting mobility and effects on road safety of alternative mobility scenarios and traffic and transport plans.

- **Design and Infrastructure**—focuses on research in two areas in control of traffic and road safety: design of traffic situations and their consistency; and clarity of road design in combination with rules on expected and desirable behavior. Entails classifying and systematizing the information available.

- **Interaction Between Road Users and Traffic Environment**—concerned with examining road user behavior to provide basic information for various projects. There are two main components: (a) diag-

nosis of differences in individual road user behavior, which has consequences for education, training, and selection; and (b) examination of situation-related behavior, specifically interactions among the various road users, which has consequences for design of traffic situations to prevent potential conflicts.

- **Injury Prevention**—initiated as a result of predominance of serious, life-threatening, and disabling traumas among road casualty victims, and includes examination of the effectiveness of measures in the field of passive safety and post-crash care to reduce fatalities and permanent injuries from road accidents.

- **Heavy Traffic**—examines the interrelationships among vehicle collision properties, vehicle dynamics and control, ergonomics, regulations, and the training and selection of drivers. The commercial road haulage sector, which is likely to exert an increasing influence on road safety problems, has received little attention in the past.

The various areas in which SWOV has recently conducted research are spread over the Medium-Term Road Safety Research Plan projects. For example, research in vehicle-object collisions, in particular practical applications, is included in the Design and Infrastructure Project. Similarly, projects specifically concerned with vehicles or electronics in traffic are included in the various projects to which they are relevant.



Bicyclists crossing bridge over a canal in Delft.