ROAD SAFETY Consulting

Safety management for road infrastructure
PTV AG offers software products and services in almost all areas of traffic and transport engineering. The business area of ROAD SAFETY Consulting joins all activities dealing with procedures for the safety management of road infrastructure.

Consulting services can be offered for all “state-of-the-art” procedures that are part of the DIRECTIVE 2008/96/EC on road infrastructure safety management of the European Union. We also provide support and knowledge transfer for topics like setup of road accident recording and analysis systems, workshops on basic and advanced road safety issues and aspects of institutional building for safety management procedures.

PTV benefits from the long-term development of accident recording systems in close cooperation with the German police as well as the comprehensive experience from consulting services in transport planning, traffic engineering and application of traffic simulation.

Accident database systems

The availability of accident data is essential, whereby characteristics of road accidents need to be linked with the location of their occurrence. This helps finding black spots and sections of high safety potential, locations where a combination of poor road design and unsafe operation has entailed the occurrence of accidents. Traffic planners and other involved parties need access to such information. Other data like traffic volume and local characteristics have to be combined with accident data to find effective and efficient measures to reduce road accidents. An accident database is only as good as the quality of the accident data records. It requires accurate recording, integrity checks and clear regulations on accident characteristics which will later help finding the deficits of the road infrastructure.

Development and application of safety management procedures

Road traffic accidents result in massive economic losses. The problem becomes even more evident if a country faces fast economic growth accompanied by a rapid increase of traffic volumes. Accidents are mostly a consequence of human behavior, but changes of the road infrastructure and other areas influencing traffic behavior can significantly contribute to preventing road accidents. A safe road infrastructure can be achieved by a comprehensive and systematic road safety practice. There are several procedures which together effect successful safety management:

- Road safety audit

Quality assurance in planning projects concerning road safety aspects independently from the planning process
helps preventing accidents in the first place and saving money which can be used elsewhere to remedy infrastructure deficits. It needs experienced traffic engineers trained in up-to-date knowledge of safety deficits, guidelines enabling systematic audits and information from accident history in order to identify relevant accident situations. Trial audits under supervision of international experts show what an effective road safety audit can achieve.

► Black spot management and network safety management

Monitoring the existing road network involves the identification of accident accumulations with striking similarities at local level. Basic instruments are the suitable visualization of such accident spots on maps and limit values for accident numbers which help identifying and ranking black spots. Police and road authorities have to be familiar with the required background information and trained how to apply the procedure.

A network safety analysis scans the whole network for safety potentials, which are areas of high, though preventable accident risks. Here, measures improving design and operation are highly beneficial. The analysis is supported by software tools that can be customized for all kinds of situations. Documented in catalogs, countermeasure developments that fit specific standard accident situations can be supplied, assisting safety and traffic engineers to improve the road infrastructure on their own.

► Safer design and operation of roads in guidelines

A sustainable safe road design and operation strongly benefit from local guidelines and handbooks that do consider safety aspects. PTV offers to enhance of existing guidelines by "state-of-the-art" safety features as well as to develop manuals and handbooks designed to help local authorities to implement safety management procedures into road planning and maintenance workflow.

► Accident analysis and safety assessment

Available data on road accidents need to be analyzed to identify major objectives of an effective road safety program. This includes determining road user categories which suffer most from road accidents. If the crucial accident characteristics are identified, measures and programs can effectively and efficiently adjusted to target groups and investment categories.

Road safety expertise

The assessment of the road safety situation is an essential part of the design process. The independent examination of existing traffic situations allows the definition of boundary conditions and specifications of new and modified road designs. Based on the actual accident situation alternative design drafts can be assessed and compared regarding the prevention of future conflict situations to help finding the safest way to design road infrastructure facilities.
Existing road facilities can often be optimized regarding their safety potential. There are, for example, many safety-relevant aspects of traffic light signalization at intersections like unprotected left-turning, insufficient intergreen times or disregard of the pedestrians’ and cyclists’ needs. Action plans and guidelines for quality assurance of different parts of the road network help making transport safer.

Urban speed management

Speed limits, speeding, speed limit enforcement and road accidents are closely related. In urban networks the influence of inappropriate speed on road safety also depends on the type of land use and the design and operation of the street. When examining speed management in urban networks, inappropriate speed limits can be identified that do not fit the street purpose and therefore result in above-average accident risks. Comprehensive reviews of different measures as part of a network wide cost-benefit analysis enable road authorities to argument for an optimized operation of the urban network.

Road safety research

Research provides the basis for road safety impact assessment. In order to quantify the safety performance of newly built or modified roads the safety impact of certain parts of road infrastructure has to be determined. Auditors, planners and engineers need to know that to be able to identify the safest possible scheme. It allows them to estimate the cost-benefit-ratios of different options of planning projects. State-of-the-art statistical methods like Generalized Linear Models are used to compare and analyze different design aspects and facilities of the road network as well as accident contributing factors.

A brief overview of all services:

► Implementation of an accident database for recording and analyzing road accidents
► Support for improving utilisable accident data recording
► Knowledge transfer concerning relevant issues of road safety aspects and management procedures
► Development and implication of safety management procedures like safety audit and safety inspection or black spot and network safety management including supply of guidelines and training
► Road safety expertise for all kinds of road planning projects as well as for existing situations
► Examination and improvement of urban speed management
► Specific road safety programs to raise the awareness of safety aspects in different areas of the road infrastructure
► Road safety research as part of the safety impact assessment

Moreover, synergies can be achieved by relating to PTV activities and experience in software development, traffic planning and engineering, pedestrian simulation and highly sophisticated risk analysis of road tunnels.