

RISMET
Road Infrastructure Safety Management Evaluation Tools
a research project of the
cross-border funded joint research programme
“ENR SRO1 – Safety at the Heart of Road Design”

1) Introduction

“Safety at the Heart of Road Design” is a trans-national joint research programme that was initiated by “ERA-NET ROAD – Coordination and Implementation of Road Research in Europe” (ENR), a Coordination Action in the 6th Framework Programme of the EC. The funding partners of this cross-border funded Joint Research Programme are the National Road Administrations (NRA) of Austria, Belgium, Finland, Hungary, Germany, Ireland, Netherlands, Norway, Slovenia, Sweden and United Kingdom.

2) Project Facts

Duration: 01/09/2009 – 31/08/2011

Budget: EUR 334.100,00

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3) Project Description

The project aims at developing suitable road safety engineering evaluation tools that will support the aims of the “improvement of road safety through an increased awareness and acceptance to implement joint road safety solutions” based on the concepts of self explaining roads (SER) and with just consideration of human factors and tolerances.

These evaluation tools allow the easy identification of both unsafe (from accidents or related indicators) and potentially unsafe (from design and other criteria) locations in a road network. With such evaluation tools estimates of potential benefits at the local and the network level can be calculated and potential effects on aspects such as driver behaviour can be estimated. Such tools empower road authorities to improve their decision making and to implement (ameliorative) measures to improve the road safety situation on the roads.

Since evaluation tools rely on good quality data, RISMET aims at reviewing available data sources for effective road infrastructure safety management in EU-countries, linked to a quick scan and assessment of current practices. This assessment will expand upon what was learned in the RIPCORDER-IPEREST project. Furthermore, RISMET aims at exploiting results related to the development and use of Accident Prediction Models (APMs) in road safety management.

RISMET culminates in a set of easy to use guidelines and codes of practice for the development and use of comprehensive road safety engineering evaluation tools, with a specific focus on APM5. These systems based tools will consider the relationship between road design, road user behaviour, traffic and road safety. A guideline and data specification providing the minimum requirements for data collecting and recording will be included.

4) Expected Results

RISMET focuses on the development of higher level evaluation tools for rural road sections and intersections and looks to provide tools enabling comparative studies between different road types in regions within a country, between roads within regions in a country and between roads of the same type in different countries (benchmarking). An associated problem in especially countries such as the Netherlands, the United Kingdom, Denmark and Sweden, is the effect of declining numbers in road traffic accidents on road safety management. Traditional approaches such as the treatment of hazardous locations/black spots are rapidly becoming irrelevant and there is an increasing pressure to develop alternative approaches to managing road safety at a local and a network level. At this stage the emphasis on road user behaviour (predominantly reflected by speed behaviour) in existing safety evaluation techniques is regarded as an important contribution for improving the predictive ability of current approaches. Examples of such non-accident based techniques include Safe speeds and credible speed limits (NL); Sustainable safety network categorisation and evaluation approaches (NL, also applied in SafetyNet SPI roads) Road Protection Score (EU, EuroRap); Inventory based traffic and safety management schemes (EU, Elvik; Sørensen).

In view of the identified problems, RISMET presents an approach focussed on adapting existing, and developing new methods for assessing the effectiveness of (often remedial) safety engineering measures on existing rural roads on the one hand and road design alternatives on new (planned) roads on the other. For the existing road network a more proactive approach than the traditional black spot treatment approach is needed. A more effective strategy would be to address potential problems before accidents have manifested themselves. This is especially relevant in countries where traditionally defined black spots seldom occur. In these cases (serious) accidents are widely dispersed over road networks and therefore are not a reliable source for identifying potential road safety defects and clearly alternative indicators need to be developed. Such indicators would form part of a more systematic approach whereby combinations of road accident, traffic, road design/road environment and driver behaviour data are utilised in developing tools and methods for managing road safety at both a local and a network level.

Developed evaluation tools should allow the easy identification of both unsafe (from accidents or related indicators) and potentially unsafe (from design and other criteria) locations in a road network. The tools should ideally include estimates of potential benefits, an evaluation of potential effects on driver behaviour and also an assessment of the acceptance of the road authority to implement such measures. Taking into account the above, the following objectives apply to this study and to the development of potential evaluation tools for infrastructure safety management:

- To define the minimum data requirements for developing evaluation tools
- To develop and define a uniform methodology for collecting, integrating and analysing road accident, traffic, road geometry and road user behaviour data
- To identify and assess the applicability of existing evaluation tools
- To (further) develop evaluation tools for assessing the efficacy of safety engineering solutions based on the interaction between variables describing the road and traffic environment and road user behaviour.

- To evaluate the applicability of evaluation tools (e.g. APMs, Network safety management tools, Safe and credible speeds etc) in other EU member countries
- To formulate good practice guidelines, incorporating a standardised methodology, for road safety evaluation tools.
- To recommend criteria for benchmarking the safety performance of especially higher order rural roads in Europe

A focus of this project will be on the application of generalised linear modelling, for developing and applying APMs for rural European roads using either empirical or full Bayesian approaches. These APMs provide State of the art models for estimating accident occurrence based on geometric properties of road infrastructure and traffic characteristics, some of which describe driver behaviour.

In addition, the project will provide an overall assessment (state of the art) of current and promising approaches to evaluate the road safety effects of engineering remedial measures and/or the road safety effects of planned new infrastructure at a local and network level. Tools that will be assessed include road network evaluation tools, safe speeds and credible speed limits, Inventory based schemes and the DV meter and VVR-GIS.