**PROJECT**

**IN-SAFETY**

**Infrastructure and Safety**

**Funding:** European (6th RTD Framework Programme)

**Duration:** Feb 2005 - Feb 2008

**Status:** Complete with results

**Total project cost:** €4,784,224

**EU contribution:** €2,936,314

**Call for proposal:** FP6-2002-TREN-1

**CORDIS RCN:** 87902

**Background & policy context:**

Over 42,000 road users are killed in European Union (EU) countries annually and around 3.5 million are injured, when under-reporting is taken into consideration. This accounts for an annual cost of over €160 billion and untold pain and suffering of the victims and their relatives. Looking at fatality numbers, car occupants are the largest single casualty group. They comprise 57% of total EU road deaths, with the majority of car occupant casualties sustained in side and frontal impacts. Looking at fatality risk however, the traffic system is less safe for the more vulnerable road users, where the risk of death on EU roads is substantially higher than for car occupants. Indeed, for pedestrians and cyclists the risk is 8-9 times higher and for motorcyclists it is 20 times higher.

A study in one EU Member State has reviewed the effectiveness of casualty reduction measures nationally since 1980. This has demonstrated that the greatest reduction was achieved from vehicle crash protection (15%). Drink/drive measures have resulted in a reduction of 11%, while road safety engineering measures in a reduction of 6.5%.

The rather small impact of road and infrastructure related measures on accident reduction until now may well be attributed to the high cost of such measures.

**Objectives:**

The IN-SAFETY project aimed to use intelligent, intuitive and cost-efficient combinations of new technologies and traditional infrastructure best practice applications, in order to enhance the forgiving and self-explanatory nature of roads, by:

- Building consensus on priorities for regulation and standardisation processes with a view to integrating the deployment of ADAS and IVIS on existing road infrastructure;

- Assessing the potential and cost-effectiveness of combined use of such new technologies (ADAS, IVIS) and innovative Human-Machine Interface (HMI) concepts, to promote the self-explanatory and forgiving character of road environments, including highways, rural roads and urban environments;

- Creating comprehensible pictograms to substitute verbal messages as used on roads, focusing on requirements of the TERN (Trans European Road Network), optimising them for impaired visibility conditions and animating them for improved comprehension;

- Optimising verbal messages which cannot be substituted by pictograms with regard to comprehension and harmonisation, taking into account national and other EU languages, their (dis-)similarities and commonly understood international key words;

- Setting up a terminology database for multilingual navigation services;

- Proposing a most suitable typeface for both traditional static and variable messages based on LED and fibre optical displays;
• Proposing rules for the appropriate structuring of information on displayed messages;
• Developing and testing new simulation models (microscopic and macroscopic) and risk analysis tools, to pre-estimate and validate the safety and functionality of road environments;
• Harmonising vertical and horizontal signing and personalising their information to the specific needs of each user
• Issuing priority implementation scenarios, guidelines for further research and policy recommendations for cost-efficient road environment development, road safety assessment and inspection, including new technological elements;
• Developing and testing new models and tools for performing safety impact related risk analysis of road infrastructure;
• Developing training tools and curricula for road and traffic management operators, focusing on the use of new technologies and telematics.

Thus, IN-SAFETY's ambition was to significantly contribute to road safety enhancement by the optimal and balanced use of available resources.

Methodology:

The project work was based on a balanced amalgam of analysis of previous work results and concept, test and report of innovative concepts, in terms of combinations of new technological elements with traditional road infrastructure. These new concepts, along with promising but as yet untested or under-reported solutions, are realised and extensively tested in this project, in 4 inter-related pilots Europe-wide, covering all road types and including among others key drivers' cohorts, such as tourists, elderly and novice drivers.

The main tasks were as follows:

• Implementation scenarios and concepts towards forgiving road environments, including benchmarking forgiving road environments; highway, urban and rural systems, and implementation scenarios with initial priorities;
• Implementation scenarios and concepts towards self-explaining road environments, including benchmarking of self-explaining road environments, Variable Message Sign (VMS) pictograms, bilingual messages on VMS, VMS content structure and typeface, personalised driver information systems and implementation scenarios and priorities;
• New models, tools and guidelines for road safety assessment, including simulation models, influencing route choice, risk analysis tools, operator training schemes, recommendations and instruments;
• Pilot implementations and tests;
• Implementation priorities and policy recommendations, including cost-benefit and cost-effectiveness analysis, guidelines for further research priorities and best practice.

In addition, the dissemination part of the project included a user forum.

Parent Programmes:  
FP6-SUSTDEV-2 - Sustainable Surface Transport

Institute type: Public institution  
Institute name: European Commission  
Funding type: Public (EU)

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**EU Contribution:** €0

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**Ptv Planung Transport Verkehr Ag**

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Key Results:

IN-SAFETY published several results regarding the deployment of ITS infrastructure and cooperative systems. From a very broad perspective, the project recommended that evaluations of newly deployed road safety systems be carried out as matter of course.

A second result stemmed from the extensive investigations concerning visibility and comprehensibility of pictograms, signing and verbal messages: the in-depth analysis served as a starting point for
harmonisation on a European level.

Furthermore, IN-SAFETY carried out four pilot tests which were discussed in terms of effectiveness, usability and acceptance. The impact assessment of a selection of IN-SAFETY scenarios shows a tendency towards positive impacts on safety, with results showing a dependency between acceptance and technical performance of the systems.

Finally, IN-SAFETY edited an ‘Operators’ Training Manual’ and Multimedia Training Tool (MMT), covering a wide overview on today’s ITS systems and ITS systems under development.

**Policy implications**

The IN-SAFETY project viewed policy measures as a way of carrying out the systems' complete assessment.

Indeed, in-depth analysis and field operational testing are needed to answer open questions regarding ITS systems. However, deriving from the enormous cost for such efforts, the samples are normally rather small and extrapolation to whole of the European fleet and driver population is rather imprecise. As a consequence, the improvement of official national traffic accident records should be supported and international databases should be extended accordingly. Furthermore IN-SAFETY shows the potential of simulation and model based analysis to reduce costs for evaluation and decision process.

The overall problem of lacking data can be addressed with more cooperation between stakeholders. With their help not only a wider data base on positive and negative impacts of systems can be established but also organisational and operational issues of innovative ITS systems can be discussed. It cannot be expected that all questions concerning cost and effectiveness, technical details or organisational issues can be solved within a research project.

European legislation bodies ought to raise awareness of open questions and bring parties like national road authorities, industrial partners, automobile clubs etc. together ('round table principle').

Documents:
- [In-Safety Policy Recommendations (Other project deliverable)]

**STRIA Roadmaps:** Infrastructure

**Transport mode:** Road transport

**Transport sectors:** Passenger transport, Freight transport

**Transport policies:** Decarbonisation, Societal/Economic issues,

**Geo-spatial type:** Other