PROJECT

RANKERS

Ranking for European Road Safety

Funding: European (6th RTD Framework Programme)
Duration: Feb 2005 - Feb 2008
Status: Complete with results
Total project cost: €4,262,850
EU contribution: €2,560,275

Call for proposal: FP6-2002-TREN-1
CORDIS RCN: 87864

Background & policy context:
The emergence of a consensus on the safety benefits of road design and management, as materialised by a draft Directive under examination by the European Parliament at the time of this project, should not overshadow the fact that all too often, it is still road injuries and deaths that trigger reactive measures by network managers.

Abundant empirical evidence suggests that many accident types tend to happen in clusters, especially if there is a road infrastructure element in the problem. It is a well-known phenomenon that certain roads induce driver drowsiness or, worse, mislead the user into inappropriate driving choices. It is less obvious however those physical road properties also constitute an important input into the improvement of on-board active safety technology, such as Antilock Braking Systems and Electronic Stability Programmes.

Objectives:
The overall objective of RANKERS was to develop scientifically researched guidelines on road infrastructure safety enabling optimal decision-making by road authorities in their efforts to promote safer roads and eradicate dangerous road sections.

Thanks to RANKERS, new knowledge was gained to meet the needs of road operators by offering a set of practical recommendations to avoid the constitution of accident cluster zones through preventive identification mechanisms and remedial measures ranked according to cost-effectiveness criteria.

Methodology:
The project distinguished itself from previous research work insofar as RANKERS addressed the 'infrastructure safety pillar' in its interrelation with driver behaviour and vehicle design, ultimately providing a vital insight into how road characteristics affect situation awareness and accident risk. Additionally RANKERS factored economic constraints and supposed a best use of limited resources reducing the return time for road safety improvements and investments.

The safety analysis addressed all types of existing roads (dual-carriageways, motorways, rural and urban roads), integrated human behaviour and vehicle technology considerations and considered both accident prevention and mitigation.

The project carried out further research on the need to provide the most suitable environment for drivers and their vehicles, not only mitigating the effects of accidents but also reducing the risk that they occur. This objective was pursued within the RANKERS project through experimental protocols which revealed the full extent of the influence of 'behaviour setting' infrastructure as part of the road traffic system. The analysis was conducted through field studies in actual driving conditions, making use of an experimental vehicle equipped with different measurement systems for video and data logging. Ultimately, RANKERS helped answer the following questions:
• how does the road surface (e.g. rough roads) and road geometry (e.g. monotonous roads) affect drivers’ state (e.g. fatigue)?
• how do road signalling design and location influence recognition of signals?
• how do the position and features of the various road elements affect driver situation awareness?

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

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

Lead Organisation:

Fundación Para La Investigación Y Desarrollo En Automoción

Address:
Parque Tecnológico de Boecillo, P.209, Boecillo
VALLADOLID
Spain

Organisation Website: http://www.cidaut.es
EU Contribution: €0

Partner Organisations:

Swedish National Rail Administration

Address:
Banverket
BORLANGE
Sweden

Organisation Website: http://www.banverket.se
EU Contribution: €0

Ministere De L’equipement, Des Transports, Du Logement, Du Tourisme Et De La Mer

Address:
10 Chemin de la Poudriere
LE GRAND-QUEVILLY
France
EU Contribution: €0

European Union Road Federation

Address:
Avenue Louise 106
1050 BRUXELLES
Belgium

Organisation Website: http://www.unife.org
EU Contribution: €0

Helsinki University Of Technology
| Address: | Otakaari 1  
| ESPOO  
| Finland |
| Organisation Website: | http://www.hut.fi |
| EU Contribution: | €0 |

| Hierros Y Aplanaciones S.a. | 
| Address: | Polígono Industrial de Cancienes, s/n  
| 252-Aviles CORVERA  
| Spain |
| EU Contribution: | €0 |

| European Commission - Directorate General Joint Research Centre | 
| Address: | Via Enrico Fermi, 1  
| TP 361 ISPRA  
| Italy |
| Organisation Website: | http://www.jrc.it |
| EU Contribution: | €0 |

| Rücker Ibérica S.l. | 
| Address: | Avinguda Comte de Llobregat, 113  
| MARTORELL  
| Spain |
| EU Contribution: | €0 |

| Itinere Infraestructuras S.a.u. | 
| Address: | Padilla, 27  
| MADRID  
| Spain |
| EU Contribution: | €0 |

| Autostrade Per l'italia S.p.a. | 
| Address: | via Alberto Bergamini 50  
| 00159 ROME  
| Italy |
| Organisation Website: | http://www.autostrade.it |
| EU Contribution: | €0 |

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Key Results:

The RANKERS project's main result was a contribution to the emergence of a European culture of safe road engineering. In this framework, the tangible outputs were threefold:

1. A ‘Road safety index’ used for assessing and monitoring road safety.
2. A catalogue of road infrastructure safety recommendations ranked according to their efficiency.
3. An interactive application of the catalogue (‘The eBook’), extended to urban vulnerable road users, available through the internet.

These outputs were due to several key results. First, the project adopted an integrated approach, addressing human (driver) behaviour, vehicle response and infrastructure - albeit with an emphasis on infrastructure, and its interactions with humans and vehicles.

This allowed to address both active (i.e. accident preventing) and passive (i.e. mitigating the effects of accidents) safety measures. As a final consequence of these activities, the project developed a performance-based ranking of safety recommendations, helping to prioritise the different solutions and optimise allocation of funds.

Technical Implications

1. RANKERS detailed experimental protocols to be conducted in field tests. These experimental protocols were based on an extensive review of the literature on accident statistics, infrastructure characterisations, human behaviour, and cost-benefit analysis. The identification of these main features influencing the occurrence of a certain accident typology (i.e. the set of scenarios defined) allowed the proposal of some recommendations for specifying the experimental protocols. RANKERS was therefore able to define and develop two different experimental protocols, and undertook two kinds of field tests: one intended for infrastructure analysis and its interaction with the vehicle, and another one exclusively for human factor analysis.

2. The analysis task was performed in the three research areas considered (Human, Vehicle and Infrastructure), to ensure a holistic approach to accident and casualties mitigation. Its goal was to analyse the three areas considered in identified road segments, taking into account specific environmental and traffic conditions. The tests clearly indicated that road infrastructure factors provided improvement opportunities to reduce accident risk. RANKERS therefore developed a measurable parameter in road infrastructure that can be used for assessing and monitoring the safety of a road segment (site inspection).

Policy implications

The fundamental policy implication of the project lies in the proposal for modifying existing guidelines in order to improve and harmonise future EU standards. In particular, the project put forward new criteria for road signs and infrastructure.

The project also identified different aspects of the road infrastructure safety topic that may constitute future research initiatives, either because there is a lack of knowledge or there is not enough data to establish reliable recommendations. The most relevant can be summarised as follows:

1. More data about the performance of the same countermeasures in different accident situations should be collected.
2. Installation and maintenance costs of several countermeasures is not available as frequently as would be desirable.
3. New tools’ effectiveness, such as road safety inspections, should also be assessed in order to demonstrate the benefits they can provide to road-safety improvement.

Documents:
-！Ranking of Recommendations for road infrastructure safety (Other project deliverable)

STRIA Roadmaps: Infrastructure
Transport mode: Road transport
Transport sectors: Passenger transport, Freight transport
Transport policies: Decarbonisation, Societal/Economic issues, Safety/Security
Geo-spatial type: Other