



Summary of projects and results from topic  
**Safety and Accident Reduction**

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## **Safety and Accident Reduction**

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# 1. INTRODUCTION AND METHODOLOGY

This report has been compiled by Langzaam Verkeer to summarise the conclusions of the activities undertaken on the key topic **Safety and Accident Reduction** as part of Work Package 2 of the PORTAL project.

## 1.1 Methodology

In order to find out which safety related European projects exist, we used CORDIS as our main source, together with DG TREN's project summary syllabi of the 4<sup>th</sup> Framework Transport RTD Programme.

These sources enabled us to get an overview of projects dealing with our key-topic. Together with the WP2 leader and in co-operation with the European Commission we then decided to screen only those projects that were interesting for the future of the PORTAL project, i.e. that were relevant to the development of educational and training material. Therefore projects strictly dealing with safety related telematics or very technical subjects such as crash test dummies or car safety technology were not included.

First, we searched the internet to find websites of the selected projects. These websites often provide all available deliverables of the project concerned. When no website was found or when deliverables and reports were restricted to project partners, we sent an e-mail to the project co-ordinator explaining the purpose of Portal and the reason for collecting the materials of this project.

After screening the project's available materials, we sent a standard IPR letter to all project co-ordinators. This IPR letter was provided by WP3.

### **Problems encountered**

To overcome some problems with finding materials on the internet or getting a satisfactory response from project co-ordinators, we had a productive meeting with René Bastiaans from DG TREN who is the scientific officer dealing with most safety projects. He helped us find missing deliverables and reports of the projects. Projects with no website were more difficult to screen than others. It is not always easy to get response from former project co-ordinators after a project has ended.

A standard IPR letter was received by WP3, which was sent to all project co-ordinators.

## 2. SAFETY AND ACCIDENT REDUCTION

### 2.1 Description of the key-topic Safety and Accident Reduction

A lot of different topics are covered under Safety and Accident reduction It can range from safety strategies for special target groups (e.g. safety of cyclists and pedestrians), over speed management and control (e.g. enforcement, intelligent speed adaptation), to safety engineering and design (e.g. safety standards for road design, crash compatibility of cars).

Traditionally one can make a distinction between three factors influencing traffic safety and thus also the possible reduction of accidents:

- *the road user*: e.g. factors influencing driver behaviour (psycho-social factors, alcohol & drugs, enforcement, etc.), traffic safety of vulnerable road users,...
- *the road network & the environment*: e.g. (re)design of roads in view of increased safety, categories of roads, weather conditions,...
- *the vehicle*: comfort and safety of a vehicle, intelligent speed adaptation, ...

It is obvious that numerous projects can relate to this subject in one way or another and that there are a lot of links with other disciplines such as psychology, medicine, technologies and industry, telematics, etc. Within the context of the PORTAL project however, we only need those projects with regard to safety and accident reduction that are relevant for education and training in transport. The selection of projects has been made with this in mind. Moreover priority was given to the 4FP Transport RTD Programme. Therefore more technical and telematics oriented projects, e.g. with regard to crash compatibility of cars, are not included.

Projects that were allocated to **Safety and Accident Reduction** are:

**ADONIS**: provides a catalogue of best practice to encourage cycling and walking and how to make these modes .It looks into attitudes and behaviour leading to urban traffic accidents

**ARROWS**: research on work zone safety standards

**DUMAS**: develops a framework for the design and evaluation of urban safety initiatives

**ESCAPE**: identifies important areas of traffic and driver non-compliant behaviour and assesses the potential of enforcement tools, both traditional and innovative, to improve compliance and thus contributes to safety on European roads

**GADGET**: assessment of changes in driver behaviour resulting from the introduction of in-vehicle safety devices, visual modifications to the road environment, educational, training and legal measures, and safety campaigns

**MASTER**: provides recommendations for speed management strategies and policies; guidelines for the development of innovative speed management tools

**PROMISING**: promotion of measures for vulnerable road users

**SAFESTAR:** provides safety standards for road design and redesign

**STAIRS:** offers standardisation of accident and injury registration systems

## 2.2 Results of the ADONIS project

The scope of the ADONIS project is broader than safety and accident reduction. It's main aim is to provide general recommendations and guidelines regarding good practice to promote cycling and walking instead of short car trips in cities. Still, the project is very relevant to this key topic because it clearly contains aspects directly linked to safety and vulnerable road users. These aspects relate to best practises to encourage cycling and walking and how to make these modes safer, and to the attitudes and behaviour leading to urban traffic accidents with two parties (car-cyclist and car-pedestrian).

Available **materials** are:

- Report *A qualitative analysis of cyclist and pedestrian accident factors*
- Book/CD *Best practice to promote cycling and walking*
- Report *Behavioural factors affecting modal choice*

The first two materials are the most relevant with regard to the key topic of safety and accident reduction, but also the third report has links with traffic safety because it looks at how traffic accident can influence modal choice.

**Experts** from ADONIS are Inger Marie Bernhoft from the Danish Council for Road Safety Research who was the co-ordinator of the project mainly dealing with the qualitative analysis of cyclist and pedestrian factors; Sonja Forward from the Swedish National Road and Transport Institute who looked into the behavioural factors affecting modal choice, and Atze Dijkstra from SWOV in the Netherlands who was responsible for collecting the best practices to promote cycling and walking.

ADONIS did not have any demonstration sites but still contains interesting information on possible **study visits**. The best practice catalogue describes a range of measures to promote cycling and walking that have been implemented throughout Europe. The technical facilities could be especially interesting for study visits. For each measure you get the location, the year of implementation, a description with the aspects that are relevant to pedestrians or cyclists, and a contact person. Categories of technical facilities are: facilities for moving along road sections, facilities for moving in areas, facilities for crossing, facilities for resting and waiting, and facilities for storing.

**Leading educational institutes** that were involved in ADONIS are the Centre for Environmental and Traffic Psychology of the University of Groningen in the Netherlands, who are specialists in traffic psychology, and the Centre for Traffic and Transportation of the Technical University of Denmark which was involved in gathering the best practice on cyclist and pedestrian measures.

The ADONIS project unfortunately does not have a **website**.

## Results of the project

ADONIS has produced a *best practice report and cd-rom* that include:

- the first comprehensive European catalogue of measures concerning walking;
- a compilation of innovative measures to promote cycling, as a complement to existing catalogues of basic measures.

The best practice catalogue illustrates a variety of examples on how streets can be shared between cars, pedestrians and cyclists, optimising at the same time conditions for all vulnerable road users, including children, elderly and disabled.

The *accident analysis* has provided valuable insight into why accidents occur. The interviews with accident-involved cyclists, pedestrians and car drivers revealed that various factors might cause an accident. Primarily, accident factors are related to lack of awareness of other traffic, for instance lack of perceiving the other party as a hazard or misjudgement of the other party's intention, but also failure to obey the rules or poor visibility due to other vehicles or weather conditions were predominant.

Normally, accidents have neither affected *modal choice* nor exposure on daily trips. However, more than half of the cyclists and pedestrians feel less safe after their accident, and generally this has resulted in a change of behaviour. So that after the accident they are more cautious when moving in traffic.

## Materials

The best practice catalogue of ADONIS has been put on a cd-rom, which can be used as educational material. The reports on behavioural factors affecting modal choice and on accident factors are also quite concise and ready to use, so that we can conclude that the development of entirely new material for ADONIS is not a priority.

## 2.3 Results of the ARROWS project

The ARROW project has developed a unified range of applicable road work zone safety measures and principles that should govern the planning, design, implementation and operation of road work zones so as to mitigate their adverse safety effects on workers and road users.

ARROWS has produced four deliverables in total:

D 1: Review of Safety Measures, Standards and Practices

D 2: Review of Behavioural Studies, Accident Studies and Research Methods

D 3: Workshop on Synthesis of Improved Sets of Safety Measures

D 4: Road Work Zone Safety: Practical Handbook and Background Report

Deliverables 1, 2 and 3 are available through the ARROWS **website** at <http://www.ntua.gr/arrows/> The practical handbook was sent to us by Rene Bastiaans of DG TREN.

**Experts** are Professor George Kanellaidis from the Technical University of Athens, who was co-ordinator of the project; Chad Gundy from SWOV in the Netherlands on

road work zone safety principles; Lena Nilsson of the Swedish Road and Transport Research Institute on behavioural studies; Wolfgang Schulte from the German BAST on safety equipment, specific layout and signing principles; and John Boender from the Dutch CROW on harmonisation and standardisation issues.

ARROWS did not have any demonstration sites, so there are no **study visits**.

The **leading educational institute which was involved** was the National Technical University of Athens.

### **Results of the project**

ARROWS analysed road work zone typologies, presents the whole range of applicable work zone safety measures (current and innovative) and reviews existing national and international standards and practices on the topic. It explores the effectiveness of road work zone safety measures in terms of their capability in achieving desired driver behaviour, towards a safer driving and working environment. It reviews experimental methods for the evaluation of safety measures. It recommends a European framework for road work zone safety standards and finally it provides practical guidance to network managers at all levels through its practical handbook.

### **Materials**

The practical handbook is the key output of ARROWS. It aims at improving the safety of road users and workers at road work zones and is intended for highway authorities, designers, contractors and other individuals and organisations responsible for traffic safety at road works. The handbook is a framework of recommendations – i.e. it is not intended to replace or supersede existing national official standards. The main focus of the handbook is the introduction of a common ‘best practice’ for road work zone design and operation.

The handbook features detailed examples of the most commonly encountered work zone cases, with recommendations on the selection and placement of safety measures. The recommended values are proposed on the basis of the following criteria:

- firstly, to ensure a high level of safety;
- secondly, to harmonise between the standards of European countries – provided that the first criterion is not violated.

In addition, the handbook presents principles, procedures, tips and checklists for the safe implementation of work zones. The general recommendations given in the handbook can be useful in the implementation of road work zone cases that are not covered by a specific detailed example, either in national standards or in this handbook. Moreover the handbook’s recommendations may be used as a starting point for the development, modification and/or amplifications of national guidelines. The handbook presents recommendations on the safety measures to be used at different work zone types, as well as on the procedures and responsibilities in the process of implementing a road work zone.

In short, the handbook includes:

- a description of road work zone safety objectives and principles;
- an outline of procedures and responsibilities for all stages of road work zone implementation;

- practical recommendations in the form of ‘safety tips’;
- an illustrated glossary of safety measures;
- recommended layouts for the most common road work zone types;
- indicative checklists.

This handbook is very useful within the context of PORTAL because of its concrete and practical approach.

## 2.4 Results of the DUMAS project

DUMAS has produced a framework for the design and evaluation of urban safety initiatives by bringing together the existing knowledge on the effects of safety measures with the overall planning and management of urban safety programmes. Urban Safety Management (USM) is an area-wide approach that integrates all the disciplines found in town planning and management.

The report for Work Package 1 and reports for WP 4 and 7 have been published. Town studies have been published as reports by the different partners. Examples are reports on national practice and experiences in different test sites, or reports on frameworks for planning and evaluation processes, but also site study reports and specialised reports on e.g. horizontal curves.

**Experts** on USM and on the framework that was developed, are Peter Wouters from the SWOV in the Netherlands, mainly on current practice and research in urban safety management; Chris Lines from TRL in the UK on safety consequences of traffic management; Lene Herrstedt from the Vejdirektorat Ministry of Transport in Denmark on speed management; Roberto Busi from the University of Brescia in Italy on safety for pedestrians and two-wheelers; and Dominique Fleury from INRETS in France, on a descriptive framework for area wide urban safety management and the link between safety and other urban activities management.

**Interesting study sites** can be found in Hobro and Gladsaxe in Denmark, Gloucester in the UK, Eindhoven, Amsterdam and Haarlem in the Netherlands. In these different cities several USM activities were developed ranging from speed management techniques, to road layout measures and overall traffic and speed management.

**Leading educational institutes** within this project are the University of Brescia in Italy and the University of Thessaloniki in Greece. More information on this project can be found on the following **website**: [www.trl.co.uk/dumas](http://www.trl.co.uk/dumas)

### Results of the project

DUMAS has achieved to produce a framework for the design and evaluation of Urban Safety Initiatives. It is an interesting project for developing study materials and contents for training and education on Urban Safety Management. DUMAScan offer safety professionals in Europe:

- up-to-date information on safety measures;
- ‘how to’ information to initiate and manage a USM programme;

- ‘how to’ information to obtain backing for such a safety initiative;
- ‘how to’ information to rally essential political support;
- a working knowledge on what level of benefits can realistically be expected;
- confidence from the town studies that initiatives can work.

These frameworks should allow robust USM scheme design and give guidance on how to manage the project to a successful conclusion. DUMAS has come to the conclusion that the number of implemented schemes and on-going projects in Europe is virtually zero. As a conclusion DUMAS states that USM is complex, political and costly. It is therefore the non-technical factors that have usually been the stumbling blocks, and it is these that the DUMAS partners have attempted to analyse in their reports.

### **Materials**

The available materials on the website are the reports on WP 1, 4 and 7 and the final report of the project. The town study reports are not available via the website, nor are they summarised or mentioned in any way. We have received some of the reports that were published by the SWOV in the Netherlands through René Bastiaans of DG TREN. We didn't manage to receive these reports via mail or letter to the project coordinator. These reports are very interesting and give a good overview of possible hindrances to implementing USM. Results from the DUMAS project are useful for a course on Safety and Accident reduction, possible study site visits are interesting as well.

## **2.5 Results of the ESCAPE project**

The aim of ESCAPE is to identify important areas of traffic and driver non-compliant behaviour and to assess the potential of enforcement tools, both traditional and innovative, to improve compliance and thus contribute to safety on European roads. ESCAPE prepares the groundwork for implementing European wide demonstration projects with regard to enforcement within the 5th Framework Programme.

Interesting **materials** from the project are a report on standardised methods and the deliverables from several work packages that can be downloaded from the website: [www.vtt.fi/rte/projects/escape](http://www.vtt.fi/rte/projects/escape).

**Experts** are Christhard Gelau from Bast in Germany on standardisation of methods for assessing enforcement; Allan Quimby from TRL in the UK on individual and social perceptions (by road users and relevant authorities) of illegal behaviour, enforcement and sanctions; David Zaidel of VTT Finland on the evaluation of priority enforcement areas and new enforcement concepts; J.A. Rothengatter from the Dutch University of Groningen on the effects of non compliant behaviour on accident involvement and severity; Charles Goldenbelt from SWOV in the Netherlands on complementary systems for effective police enforcement; and Göran Nilsson from the Swedish National Road and Transport Research Institute on automatic traffic enforcement procedures, technologies and prospects.

There are no interesting **study sites** to visit since it was the aim of Escape to prepare the groundwork for future European demonstration projects. These are however not mentioned on the website, if they were already known at all.

**Leading Educational Institutes** on this subject are the University of Vienna in Austria, the University of Groningen in the Netherlands and the Aristotle University of Thessaloniki in Greece.

### **Results of the project**

Important conclusions from this project are that, when introducing or developing automatic enforcement on a national level, it is important to:

- adjust the legislation in order to achieve an effective system;
- try to influence the speed behaviour on road sections;
- improve the feedback from automatic enforcement systems to the driver.

The limitations to the use of automatic enforcement will be less and less, which will result in increasing use of the method. It is therefore important to consider traffic as a system, with enforcement as an integrated part of the transport system and not just an isolated safety measure.

ESCAPE is focused on safety and accident reduction so we can conclude that it is a specific key-topic related project.

### **Materials**

In the overall description of the project it is clear that several workshops were set up. These included workshops on acceptance of alternative enforcement measures, a workshop for explaining the results of the project, and a separate workshop on recommendations. Reports on these workshops would be very interesting as input for training and education. These reports are not available on the website, nor is it mentioned where you can find them or order them. The materials (reports on deliverables) that can be downloaded on the website are interesting but have to be worked on to use in training and education.

## 2.6 Results of the GADGET project

GADGET stands for ‘Assessment of changes in driver behaviour resulting from the introduction of in-vehicle safety devices, visual modifications to the road environment, educational, training and legal measures, and safety campaigns’.

The project subdivided three ‘E’s’ to structure the work: ‘engineering’ with *telematics* and *modifications to the road* environment as work packages, ‘education’ with *education and training* and *safety campaigns* as work packages and ‘enforcement’ with *legal measures* as work package. The five work packages focused on different approaches.

Interesting **materials** are the reports found on the website. Each work package has developed a report on its specific subject. There is a report on education, safety campaigns, legal measures, road environment and telematics. All interesting materials and results can be found at the following website address: [www.kfv.or.at/gadget](http://www.kfv.or.at/gadget).

**Experts** on this subject are Patricia Delhomme from Inrets in France on safety campaigns; Tapani Mäkinen from VTT in Finland on legal measures; Horst Schulz from Bast in Germany on telematics; Stefan Siegrist from the Swiss Council for Accident Prevention on education and training; and Fridulv Sagberg from Institute of Transport Economics in Norway on modifications to the road environment.

There are no interesting **study sites** to visit.

### Results of the project

A conclusion from the GADGET project is that empirical evidence on safety effects is relatively poor. This is because the evaluation of measures is a difficult task. This problem often is solved by co-ordinating implementation and accompanying research. The following facts limit the potential relevance of evaluation studies:

- often, evaluation studies are restricted to accident data –and that implies also- that the mechanisms which determine the success of a measure are rarely considered in the studies,
- effects of mechanisms that might oppose the desired effects cannot be studied
- it cannot be understood why and how certain effects result from a combination of various measures.

GADGET prepared new perspectives for the assessment of safety measures:

- the work package reports offer a structured and detailed description of the knowledge and evidence available so far;
- the theoretical assumptions upon the mechanisms of impact on driver behaviour allow a structured consideration of the most promising applications of the various safety approaches;
- this structured approach also allows a well-based discussion on reasonable combinations of traffic safety measures.

## Materials

Interesting material for PORTAL are the books on education and the one on safety campaigns. These materials are almost directly useable for training and education. The other books and deliverables are also very interesting to use as content input for specific training and education on safety measures.

## 2.7 Results of the MASTER project

The MASTER **materials** comprise all deliverables which are public and available through the MASTER website at [www.vtt.fi/rte/projects/yki6/master/master.htm](http://www.vtt.fi/rte/projects/yki6/master/master.htm). No popular brochures or other communication material was developed. The deliverables are:

- D 1: Report on Speed & Environment (literature)
- D 2: Report on Speed & Environment (field)
- D 3: Report on Effects of Enforcement on Speed
- D 4: Report on Speeds in Europe
- D 5: Report on Road Design and Speeds (simulator)
- D 6: Report on Acceptability of Speeds
- D 7: Report on Speed/Accident Relationship
- D 8: Report on Framework for presenting effects
- D 9: Report on Categorisation of Roads and Speeds
- D 10: Report on Comparison of ATT (advanced transport telematics) and non-ATT measures
- D 11: Report on In-Car Speed Limiters
- D 12: Final Report on Recommendations for Speed Management Strategies and Policies

**Experts** from the project are: Heather Ward from University College London on the effects of different levels of speed; Babul Baruya from Transport Research Laboratory (UK) on speed – accident relationship on different kinds of European Roads; Richard van der Horst of TNO in the Netherlands on road design and influences on speed behaviour; Ralf Risser from FACTUM in Austria on acceptability of speeds and speed limits to drivers and vulnerable road users; András Várhelyi of Lund University in Sweden on innovative speed management tools and the evaluation of in-car speed limiters; Oliver Carsten from the University of Leeds (UK) on comparison of ATT and non-ATT approaches to speed management; and Veli-Pekka Kallberg from VTT in Finland, who was co-ordinator of the project and expert on strategies and policies for speed management in general.

MASTER did not have any demonstration sites, so there are no **study visits**.

**Leading educational institutes** that were involved are the University of Leeds, the University of Lund and University College London.

## **Results of the project**

MASTER has produced:

- a review of current speed management methods and the various levels of responsibility for implementation;
- a survey of current speed limits across Europe for typical road categories;
- a framework for the systematic and comprehensive assessment of the impacts of changes in speed, starting with a social cost-benefit analysis and taking into account quantitative and qualitative effects;
- a comprehensive analysis of the reasons for a driver's choice of speeds, including interviews with drivers and pedestrians in 6 countries;
- a review of Advanced Transport Telematics (ATT) and traditional speed-reducing systems, together with tests of the most promising ones in a driving simulator;
- an assessment of 25 different speed management measures and tools in terms of impact on speeds, cost effectiveness and other relevant information;
- recommendations for speed management in compliance with the objectives of the Common Transport Policy, in particular:
  - speed limits for roads of similar classification
  - guidelines for the application of speed management measures
  - preparations for the introduction of in-vehicle speed limiters
  - self-explaining road design
  - automated speed enforcement
  - internalising external (accidents, environment) costs;
  - campaigns to raise public awareness about the impacts of speed;
  - restriction of vehicle speeds.

## **Materials**

MASTER produced a lot of deliverables. The following deliverables are the most relevant for PORTAL according to René Bastiaans from DG TREN:

D 3: Report on Effects of Enforcement on Speed

D 5: Report on Road Design and Speeds (simulator)

D 7: Report on Speed/Accident Relationship

D 8: Report on Framework for Presenting Effects

D 9: Report on Categorisation of Roads and Speeds

D 12: Final Report on Recommendations for Speed Management Strategies and Policies

Next to that there are also a number of conference papers available through the website. MASTER has also developed a tool, a spreadsheet in Excel, which allows one to analyse the impacts of a specific speed management policy. This concrete tool is very interesting for PORTAL.

No popular dissemination materials have been developed. Since the information of MASTER reports is so comprehensive it is advisable to develop some summary educational material on the key results within PORTAL.

## 2.8 Results of the PROMISING project

PROMISING aims to show the potential for reduction in casualties of vulnerable road users like pedestrians, cyclists, motorised two wheelers and young drivers, by technical non-restrictive measures. These measures are compared with other measures to enable policy makers to weigh measures against each other.

None of the PROMISING deliverables has been officially approved yet. Through PORTAL-partner CERTU, who is involved in PROMISING, we managed to collect the draft versions of all deliverables. PROMISING does not have a website, nor do we know of any popular dissemination **materials**.

The following reports have been produced:

D 1: Pedestrian safety problems and countermeasures

D 2: Cycling

D 3: Moped and motorcycle riders and measures to improve their safety

D 4: Young drivers

D 5: Cost-benefit analysis

Final report: Promotion of mobility and safety of vulnerable road users

**Experts** from PROMISING are: George Kanellaidis from the Technical University of Athens on pedestrian safety problems and counter measures; Lars Leden from the Technical Research Centre of Finland on non-restrictive safety measures for cyclists; P.C. Noordzij from SWOV in the Netherlands on safety measures for moped and motorcycle riders; Horst Schulze from the German Bundesanstalt für Strassenwesen on young drivers; and Pat Wells from Transport Research Laboratory (UK) on cost-benefit analysis of safety measures for vulnerable road users.

The project did not have any demonstration sites. In its final report however, it does mention a number of locations with good infrastructure examples favouring the safety of vulnerable road users. These could perhaps be interesting for **study visits**, although the information is not very detailed.

**Leading educational institutes** that were involved in PROMISING are the National Technical University of Athens, the Università degli Studi di Brescia (Italy) and the Università degli Studi Roma Tre.

### Results of the project

PROMISING analysed the current situation with regard to safety and mobility for pedestrians, cyclists, motorised two-wheelers and young drivers and also examined legislation. Based on these findings and on a cost-benefit analysis, the following types of measures are recommended:

- measures that *reduce driving speed*, especially in urban areas, will improve safety, and sometimes mobility, for pedestrians and cyclists, but more kinds of benefits have to be included in the analysis;
- the benefits of *facilities for pedestrians and cyclists* exceed costs by a wide margin;
- measures that *improve conspicuity and visibility* are cost beneficial;
- the implementation of measures regarding *injury protection* underrun guard rails and helmet wearing for motorised two-wheelers;
- graduated licensing and *driver's licence on probation, including a lower BAC limit of 0.01 %*, are promising measures for inexperienced drivers.

The results of the cost-benefit analysis can be combined with the recommended measures of the reports on pedestrians, cyclists, motorised two-wheelers and young car drivers. Thus, the project concludes that the following 10 measures are the most important:

1. A separate network of direct routes for pedestrians and a separate network of direct routes for cyclists
2. Transport alternatives for young drivers like disco buses
3. A categorisation of roads to separate flow traffic from distribution traffic and access traffic
4. Area-wide speed reduction apart from roads with a flow function for motorised traffic
5. Implementation (and development) of infrastructure design standards for pedestrians, cyclists and motorised two-wheelers
6. Right-of-way rules and regulations for cyclists and pedestrians in urban areas and technical measures that support right-of-way and stimulate perception and anticipation.
7. Review of traffic rules to consider privileges for motorised two-wheelers in relation to car drivers.
8. A graduated or intermediate licensing system for young car drivers and motorised two-wheelers.
9. Education that focuses on a considerable and respectful attitude to other road users.
10. Injury protection by design of cars and heavy vehicles.

### **Materials**

As far as we know PROMISING only has its research reports. Therefore it is advisable to develop additional material within PORTAL processing the main results of the project in a more didactic way. The reports are clearly structured according to target group and theme, so it should not be too difficult to deduct the main conclusions from it.

## 2.9 Results of the SAFESTAR project

The overall objective of the SAFESTAR project is the formulation of safety arguments for selecting certain design elements or for recommending certain dimensions. Main output of SAFESTAR are recommendations for design guidelines or possible standards on the basis of road safety considerations. SAFESTAR concentrates on roads that can be part of the TERN network, i.e. primarily motorways, express roads, and major interurban roads. In addition some attention is devoted to urban conditions.

There are different reports and deliverables from the different work-packages. Through René Bastiaans we got hold of a literature review on tools, procedures and experiences for road safety audits and of the final report.

**Experts** on this project are: Martinus Slop from the SWOV (Institute for Road Safety Research) in the Netherlands, Marieke Martens from TNO (Human Factors Research Institute) also from the Netherlands, Karl-Olov Hedman from VTI in Sweden and Harri Peltola from VTT in Finland.

Within this project there were no demonstration sites, so there are at this moment no interesting **study sites** to visit.

The **leading educational institute** involved is the National Technical University of Athens.

Safestar has no **website**, so all information has to be gathered elsewhere.

### Results of the project

The level of road safety is, to a large extent, determined by the features and layout of the road transport system infrastructure. If the human errors which result in accidents are to be held in check then proper road design is crucial. It has been estimated that improvements in the engineering of roads have been one of the main factors behind the reduction in casualties on the roads of EU countries in recent years. The overall objective of SAFESTAR has been the formulation of *safety arguments* for selecting particular design elements or dimensions for inclusion in the improvement and augmentation of design standards.

SAFESTAR lists a number of separate recommendations for respectively the European Commission, for Transport Departments of national governments, for road authorities and those responsible for manuals and guidelines on road design and for research institutes.

SAFESTAR suggests a number of new safety standards per road type: motorways, express roads, single carriageway rural roads, major urban junctions.

Finally the project also formulates where more research or data are required with regard to these types of roads.

### Materials

The final report contains very concrete recommendations for road design which could be turned into didactic materials with practical checklists and implementation guidelines.

## 2.10 Results of the STAIRS project

STAIRS (standardisation of accident and injury registration systems) aims to develop a harmonised procedure for the in-depth investigation of crashes in order to improve crashworthiness and safety regulations. There are three main countries involved in this research, the United Kingdom, France and Germany. The key areas to be addressed include a core dataset, national crash population, data quality, data processing and exchange, statistical methods for data analysis, terminology and ethical considerations.

Interesting **material** from this project is the final report that can be downloaded from the website. There is also a brochure with a description of the project, a working document on crash injury studies and collection methods. Other available materials are a book with the review of studies and variables and values for data collection. A PowerPoint presentation with the results from the workshops is also available. These and other interesting results can be found at the website: [www.ice.co.uk/stairs](http://www.ice.co.uk/stairs).

**Experts** in this area are Bernard Laumon and Gilles Vallet from Inrets in France, Philippe Lejeune from CETE in France, Ingo Kossman from Bast in Germany, Barry Sexton from TRL in the UK and Rob Ross from Loughborough University also in the UK.

**Leading Educational Institutes** within this project are Loughborough University from the UK and the Medical University in Hanover (Germany).

### Results of the project

The project consists of five main work packages: two main areas of research and further three areas of dissemination and implementation. The research areas comprise the major problems identified as requirements for a successful harmonised data collection system. These are: the information collection and handling processes, and the statistical methodology to enable linkage to other databases. As a result from the STAIRS project it became clear that there is still a long way to go before we actually have European-wide harmonised in-depth accident and injury data, databases or one database. There are different barriers to overcome, e.g.:

- the way in which data are collected or in fact not collected at all in different Member States;
- ethical questions, privacy and confidentiality of data;
- the costs involved in data acquisition; data analysis and information provision;
- the differences in importance that various people attach to road safety in general across the European Union;
- the willingness to harmonise our efforts, which will imply a change in the 'way we do things around here'.

Stairs is only one of the steps in this process, but it is considered by the EC as an important step.

### **Materials**

In addition to the materials that can be downloaded from the website, it is mentioned in the final report of the workshop that there is a CD-rom with copies of the slides used in the presentations of the different work-packages at the workshop. The CD-rom also contains the full presentation papers. Only points of discussion can be found on the website. There is no indication on the website where you can order the CD-rom.

### **3. RECOMMENDATIONS FOR NEW MODULES**

The screening of the different projects has revealed that valuable material is available on safety and traffic reduction that can serve as useful input for the development of educational and training material with regard to this subject. From the results of the interviews conducted in WP1 we could conclude that there is a need of information on general and broad themes as traffic safety and accident reduction. The projects we have screened cover different aspects of the safety problem and will thus allow the development of modules on different, yet complementary subtopics of the field of safety and accident reduction. Subject fields covered by the screened projects are:

- behavioural aspects influencing traffic safety: ADONIS, ARROWS, ESCAPE, GADGET, PROMISING
- infrastructure measures favouring the safety of vulnerable road users: ADONIS, PROMISING
- qualitative and quantitative accident analysis and registration: ADONIS, STAIRS
- road work zone safety measures: ARROWS
- urban safety management: DUMAS
- enforcement: ESCAPE
- legislation: ARROWS, ESCAPE, GADGET
- road design: GADGET, MASTER, PROMISING, SAFESTAR
- safety campaigns: GADGET
- in-vehicle safety devices: GADGET, MASTER
- speed management: MASTER

Due to the broad scope of the key topic quite different disciplines in the transport field are touched upon through these themes: engineering (infrastructure measures, road design), legislation, behavioural studies, telematics. The screened projects can serve as input for modules serving these different disciplines.

## 4. FINAL CONCLUSIONS

A lot of interesting material is available on *safety and accident reduction* that could serve as useful and innovative input for training material on this subject.

Although dissemination has become increasingly important in European research projects over the past years, the amount of dissemination material for the safety projects is still limited. Most safety related projects only produced research reports and deliverables and hardly any 'popular' material such as brochures, videos, handbooks etc. It should therefore be PORTAL's goal to convert the existing content into user-friendly didactic and more concise material for education and training purposes. Often the available information is quite concrete, practical and well structured - and thus ready to use as content - but only lacks the right medium to present it to the target group of PORTAL.

It should be noted that it is not always easy to get hold of existing materials from the different projects. Therefore, PORTAL not only has the important task to develop new material on the basis of existing content, but also to improve and optimise the dissemination and distribution of existing materials.