RODRIGUE Steering Committee

RODRIGUE action conclusions

Final report

Date	Référence	Rédacteur(s)
Feb. 29th, 2008	rodrigue_v3	Olivier Fallou (Erdyn), Marie-Line Gallenne (LCPC), Éric Dumont (LCPC), Bernard Jacob (LCPC),

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Introduction: context and objectives

RODRIGUE is a cooperative action of the FEHRL, which aimed at preparing contents for proposals on Intelligent Highway (initially Vehicle-Infrastructure Dialogue for Road Safety) for the FP7 second call, opened in late 2007 and closed in May, 2008.

"RODRIGUE" states for ROad Diagnosis to shaRe Information and risk manaGement with UsErs. It addresses the following topics[1]:

- **DIAGNOSIS** (of infrastructure): How to measure and map road characteristics (visibility, skid resistance, geometry) and how they influence trajectories... Diagnosis is considered at two levels:
  - L1: measurement and mapping of road characteristics and conditions
  - L2: statistical and static assessment of danger (link with accidentology) and correlation with road conditions (including observation of trajectories).
- **COMMUNICATION:** How to share information (Vehicle to Vehicle, Infrastructure to Infrastructure, Vehicle to Infrastructure)
- **INFORMATION:** How to provide information to users (traffic control devices, VMS, signals, on-board messages, HMI...)
- **RISK** (to users): How to assess risk of accident (in curves, at intersections, because of headway...) and give warning. RISK deals only with real time assessment.
- **ACTION** (preventive or corrective): How to assist driver to prevent accidents (by acting on the speed or the brakes...)
- **EVALUATION**: How to assess impact of cooperative systems on behaviour (relevance, efficacy, acceptability...)

Five tasks have been handled in RODRIGUE action:

- Task 1: projects review

  This task aimed at providing quality information on existing and recent research projects that cope with RODRIGUE themes, and deduce lacks and future perspectives.

- Task 2: users' needs

  This task had to collect information about users' needs: road operator and administrations, traffic information suppliers, etc.

- Task 3: identification of potential partners and networking

  This task aimed at identifying potential partners and competing teams involved in the targeted topics.

- Task 4: lobbying

  This task aimed at promoting RODRIGUE conclusions by lobbying with EC, FEHRL, ERTICO, ERTRAC, etc.

- Task 5: RODRIGUE workshop

[1] it should be pointed out that sustainable development is not a specific consideration of RODRIGUE work. Nevertheless, works about traffic management have obvious links with environmental issues.

This planned workshop has not been held because of context changes during RODRIGUE action. It has been replaced by several dissemination actions, among which a participation in Intelligent Highway workshop held on October 25, 2007 in Brussels.

Partners involved in RODRIGUE Steering Committee are:

LCPC (France)	Bernard Jacob; Marie-Line Gallenne; Éric Dumont
ARSENAL (Austria)	Peter Saleh; Stefan Deix
BRRC (Belgium)	René Jacobs; Xavier Cocu
IBDIM (Poland)	Jacek Malasek
UCD (Ireland)	Eugene O'Brien
UNIFI (Italy)	Francesca La Torre; Lorenzo Domenichini
VTI (Sweden)	Mattias Hjort
ERDYN (France) – LCPC's subcontractor	Olivier Fallou; Ségolène Hibon
associates	ERTICO, FEHRL, INRETS, NPRA

1 Brief History of RODRIGUE action

RODRIGUE was first a tentative consortium whose aim was to answer to the first FP7 call for proposals. A first design of this project was presented to FEHRL in November, 2006 with following objectives:

- to record and analyse vehicle trajectories and to monitor infrastructures in order to identify drivers' difficulties;
- to assess risk level for road managers and drivers depending on traffic, weather, infrastructure and signs conditions;
- to improve tools for road management, signing, on-board ADAS and services;
- to evaluate proposed tools (acceptability, efficiency);

in order to provide following benefits:

- improvement of road safety;
- sharing and rationalisation of road diagnosis and facilities;
- harmonisation of European policy for road signing, implementation of ADAS, new signs and traffic data display systems, use of positioning and navigation systems.

The French partners first met in Paris on December 19, 2006.

Core group meeting no 1 took place in Paris on January 9, 2007. Task 1 (project review) was decided in this meeting, and had to be presented in autumn 2007. Objectives and scientific scope were decided: main focus was on infrastructures, even if drivers and vehicles had to be considered in the project. It was decided to postpone the submission of RODRIGUE project to the second call.

The second working group meeting was held in Paris on March 19. It was decided not to submit a proposal in the first call for a CSA. Philippe Lepert was at this time appointed by LCPC as project leader for the future project. Contract with French Ministry of transport provided funds to support RODRIGUE preparatory action.

On the third meeting (May 22nd), the five tasks described in this report's introduction were defined. It was decided to use part of the French Ministry budget to appoint subcontractors to support the working group in tasks achievement (Erdyn consultants).

On the fourth meeting (August 30th), it was decided to change part of the organisation as LCPC was pursuing composition of consortium and draft project in parallel with RODRIGUE work. Tasks 3 and 4 relative to partners' identification and lobbying have been reaffected to LCPC members.

RODRIGUE's work has been presented at the FEHRL Intelligent Highway Workshop held in Brussels on October 25th.

Two more meetings have been held in Paris on December 12th, 2007, and January 31st, 2008. It was discussed about reports finalisation and dissemination of RODRIGUE work results.

2 A DRAST supported work

2.1 Main objectives of DRAST contract

2.1.1 Objectives of RODRIGUE

Since 2000, French Ministry of Transports (DRAST and DSCR) have been supporting projects aiming at improving road safety and vehicles-infrastructures-drivers ; among them ARCOS, LAVIA and SARI, have been selected by PREDIT and partly supported by French National Research Agency (ANR). Recent works considered driver information in case of accidentogeneous situation, based on road data : wet road low adherence, inexpected low visibility, road design ruptures… IN-vehicle integration of roadside information is in progress.

LCPC demonstrated their skills in leading federative French and European projects about trafic safety and management. They developed research partnerships with public laboratories, consulting and engineering companies, industries and districts councils.

FP7 has an infrastructure program with stakes related to road safety, and an important financial support (12M€), and DRAST believe French stakeholders could lead a European consortium on this topic as soon as the call for proposal is opened, based on recent research results.

2.1.2 Detail of RODRIGUE action

The main objective was to collect information to answer European Commission calls for proposals about road safety. More specifically calls in which road and traffic information are used to assist road operators and drivers (road diagnosis, ADAS). It is thus needed to put together European key-actors with the support of FEHRL, in order to propose a consortium that can run a project with LCPC as a main stakeholder.

The action steps are to:

- make a state of the art of recent projects results and works in progress in Europe; identifying potential partners and competitors;
- complete the heart of a consortium with private and public partners;
- complete a scientific project within the topics of FP7 calls of proposals;
- watch for calls opening;
- do lobbying to European commission with FEHRL, ERTICO and other related entities to promote the project.

2.2 RODRIGUE action organization

In order to answer to DRAST and FEHRL demand in November 2006, LCPC proposed research topics in the framework of chapter 7.2 (surface transports). They have proposed RODRIGUE project: ROad Diagnosis to shaRe Information and risk manaGement with UsErs (Interaction between infrastructure-vehicle-driver for a better mobility and safety), thus completing the objective of DRAST contract which was to continue French projects ARCOS, SARI and LAVIA.

This document is the result of preparatory actions for completing such a project.

2.3 Glossary

DRAST: Direction de la Recherche et de l'Animation Scientifique et Technique (French Ministry of Transport – Research and technology administration)

DSCR: Direction de la Sécurité et de la Circulation Routière (French Ministry of Transport – Road safety and trafic management administration)

ARCOS: Action de Recherche COncertée en Sécurité routière (Federative research program for road safety)

LAVIA: Limiteur de vitesse s'Adaptant à la VItesse Autorisée (ISA project)

SARI: Surveillance Automatisée de la Route pour l'Information des conducteurs et des gestionnaires (Automated road monitoring for drivers and operators information)

ANR: Agence Nationale de la Recherche (French Research National Agency)

FEHRL: forum of European highways research laboratories

3 Project review

The first task of this action is to draw an inventory of recent and on going projects, both national and European, with specific results and outputs relevant to the scope of RODRIGUE (see Appendix).

RODRIGUE borders on different topics, which, for the sake of this task, will be classified in the six following areas:

- Topic 1 **Diagnosis** (of infrastructure)

  How to measure and map road characteristics (visibility, skid resistance, geometry) and how they influence trajectories... **Diagnosis** is considered at two levels:

  - L1: measurement and mapping of road characteristics and conditions;
  - L2: statistical and static assessment of danger (link with accidentology) and correlation with road conditions (including observation of trajectories).

- Topic 2 **Communication**

  How to share information (Vehicle to Vehicle, Infrastructure to Infrastructure, Vehicle to Infrastructure).

- Topic 3 **Information**

  How to provide information to users (traffic control devices, VMS, signals, on-board messages, HMI...).

- Topic 4 **Risk** (to users)

  How to assess risk of accident (in curves, at intersections, because of headway...) and give warning. **Risk** deals only with real time assessment.

- Topic 5 **Action** (preventive or corrective)

  How to assist driver to prevent accidents (by acting on the speed or the brakes...).

- Topic 6 **Evaluation**

  How to assess impact of cooperative systems on behaviour (relevance, efficacy, acceptability...).

Project review has been done in three phases: at first RODRIGUE partners completed descriptive sheets for projects they were involved in. Then a complementary work was done by Erdyn in order to take into account other projects, either European or national. Finally partners were asked to check and validate the descriptions as put into words in the task 1 report.

After these three phases, 23 recent European projects and 32 national projects have been considered in project review. They have been retained because of their relevance to one or several RODRIGUE topics of interest.

Conclusions of this project review enable to express research needs in order to complete work already done. Synthesis for each topic is provided below, with identified research needs.

3.1 Diagnosis

The diagnosis topic considers two sub-topics: measurement on the one hand and road statistical diagnosis on the other hand. The project review shows that both sub-topics are not relevant to the same type of consortium and financing scheme:

- measurement technologies related projects are considered at the European level, in order to capitalize on many stakeholders' skills: SMEs, car manufacturers, research institutes… They consider the way road and traffic characteristics can be measured;
- road statistical diagnosis is based on comparison between road data and accidentology databases. Thus it is more efficiently handled at national level because databases are not homogeneous between European countries. Besides, national demonstrations of road/accidents correlation can have immediate counterparts in terms of road engineering or signalisation. Field operational tests are mostly handled in national projects.

For measurement technologies, several projects handle the friction and skid resistance measurement, either as static road characteristics, or as real-time characteristics of road-vehicle system. It appears to be a major research theme in the European road and automotive research community.

3.1.1.1 What remains to be done:

- to achieve common evaluation procedures for diagnosis systems and methods.

3.2 Communication

Communication themes must consider problems such as European countries inter-operability. Therefore communication projects are handled in European rather than national projects as European standardisation must be considered as soon as possible in systems development.

3.2.1.1 What remains to be done:

- to define new databases contents relatively to expected applications, based on a consensus;
- to achieve specifications of enriched maps formats;
- to build a standard for V-V and V-I communications (ongoing in some projects).

3.3 Information

Information is more or less handled in a vast majority of projects, both European and national. But information-centred projects are not very numerous: one can notice AIDE project which copes with adaptive interface. Most of projects make use of HMI for demonstration purpose.

3.3.1.1 What remains to be done:

- to achieve common evaluation procedures for information delivery devices and signs;
- to certify coherence between in-vehicle information and road signs: map-contained information about for example legal speed limits should be certified whenever security functions are based on them;
- to complete harmonisation of European road signs and to use these signs on IVIS.

3.4 Risk

In this document, risk is related to real time or adaptive risk evaluation. Risk function concept is developed is some projects like SARI or PREVENT, either national or European.

3.4.1.1 What remains to be done:

- to complete work about risk functions;
- to initiate work about hierarchisation of risks and various ADAS superposition (for example: lane departure prevention and collision mitigation).

3.5 Action

As identified projects are related to road diagnosis rather than to self-sufficient vehicle embedded systems, action means are quite badly handled therein. Furthermore, they are mode dealt with as a major theme at the national level in the identified projects.

3.5.1.1 What remains to be done:

- to achieve common evaluation procedures for action devices.

3.6 Evaluation

Evaluation is more and more a major concern in most of R&D projects. The greater proportion of projects dealing with evaluation at national level is explained by the fact that most FOTs are handled at this level (see for example LAVIA).

3.6.1.1 What remains to be done:

- FOTs have to be made in order to assess acceptability and efficiency of systems, procedures and devices developed in previous and future projects.

Please refer to Appendix 1: Task 1 report.

4 Users' needs analysis

Users' needs are gathered through four elementary actions:

- interviews with a few European road authorities (RODRIGUE action);
- online questionnaire (RODRIGUE action);
- SAFEMAP questionnaire.

LCPC actions results are not detailed here but are taken into account in general conclusion.

4.1 European road authorities interviews

It should be kept in mind that only four interviews have been made. Therefore they are not representative of all European road administrations point of view:

- Some national road administrations are quite chilly about gathering individual data from light vehicles. This point poses legal issues about individual rights of drivers whose car transmit information.
- Major concerns differ from one country to another as state of the art of road diagnosis, weather conditions and driver behaviour is not equivalent from north to south and from east to west of Europe. As an example, freezing is a prominent concern for cold-winter countries
- Data management should be an important topic as more and more information will be gathered in the future: storage and analysis of huge amount of data, raw data storage duration, link with enforcement authorities, use of personal data.
- Some road administrations appear not to be in favour of compulsory rules in deployment of safety systems (either for diagnosis or for action). They tend to prefer incentive measure: insurance fees reduction for instance. It is important to point out that on-board recorders are being installed in Denmark, related to insurance fees savings in case of good driving behaviour (for example relatively to speeds limits).
- Economic considerations about deployment have to be taken into account as soon as possible in development process. In particular, deployment has to be designed so that the system provides some services in the transient phase.
- It is not a road administrations task to contribute in developing on-board devices. It is devoted to car manufacturers or equipment manufacturers. Some administrations have in charge promotion of on-board systems for road safety an traffic management purpose.
- Vulnerable users have to be taken into account in development of new information systems. Counting two-wheels vehicles is a stake by regard to road traffic analysis.
- United States point of view on data management is that a third party is necessary for people to be confident that authorities will not have access to individual data collected through on-board diagnosis systems.

4.2 Online questionnaire

98 answers have been received for the questionnaire. Distribution of respondents' profiles and nationalities are not homogeneous so that results should be taken as indications and not as statistical truth.

- Disparities in respondents' profiles may have influence on statistical analysis. It should be kept in mind that researchers are overrepresented in this survey.

- Vehicles parameters are not seen as prominent in accident parameters. This point is consistent with RODRIGUE topics of interest. Actually, stakeholders interested in vehicle data gathering are quite different than for other data (more traffic and road related).
- Mainly road authorities should support system deployment costs for RDS, plus vehicle manufacturers and information suppliers for RIS.
- Deployment should take into account systems costs, which are the more crucial issues for acceptance of the systems. A cost-benefit evaluation should be made in early phase of each development project and be taken into account in design phase when possible.
- Business model for Intelligent Highways have to be developed. Insurance companies and all involved economic stakeholders should be involved in R&D projects in the earliest phases.
- As a driver, respondent may privilege development of information systems rather than action devices. This position is consistent with many acceptability studies conducted in various projects (e.g. ARCOS).
- Projects should not only consider highways but also rural roads. In this case, the deployment business model is not the same.
- European standards have to be developed about road diagnosis and risk labelling of roads, cost-effectiveness of possible measures, and acceptance of systems.
- As driver behaviour is a major parameter for road safety and traffic management, road design should be thought in order to infer the right behaviour.

4.3 SAFEMAP questionnaire

In this document, SAFEMAP project survey should be mentioned: in order to provide recommendations, and ultimately obtain encouragement from public authorities, the SafeMAP project team surveyed French Regional Authorities in order to better understand their position towards this type of application and assess their level of commitment in the data collection process.

The main issues addressed by the survey were:

- the eventual financial, institutional, organisational and political bottlenecks that might hinder road operators' contribution to the funding of data collecting and maintenance
- assessing the returns road operators can expect from the successful implementation of the system.

5 applications were presented in the survey:

- speed limit warning
- accident spot warning
- curve warning
- intersection warning
- physical restriction warning (trucks)

Road operators also had a view of the road attributes required for building these 5 applications.

4.3.1 Feedback from the survey

4.3.1.1 a. WARNING RELEVANCE

3 warnings received near unanimous agreement:

- speed-limit warning
- intersection warning with right-of-way
- physical restriction warning for trucks

Only half of the answers were in favour of the accident spot warning. The curve warning had a favourable response of 62%, one of the drawbacks being the liability risks possibly incurred by the road operator.

4.3.1.2 b. DATA COLLECTION

The data available from the French Regional Authorities are:

- Accident data (100%)
- Intersection right-of-way systems (62.5%)
- Speed-limits (50%)
- Truck physical limitations (37.5%)
- Gradients, adherence, macro-texture and evenness(25%)
- Road plots and longitudinal gradients (12.5%)

In general, road operators are keen on both road databases and map databases. The data is collected on the entire network (2X2 and bi-directional networks). The data is always stored in road databases and in map databases in 75% of cases. Transition from road database to map database wouldn't be a major difficulty. Moreover, the operators lacking data are willing to collect additional data to complete their databases.

The main uses of the collected data are:

- Operation and maintenance programming
- Accident studies and safety planning
- Implementing preventive warnings when planning isn't possible
- Road-sign coherence and policy

4.3.1.3 c. FINANCIAL CONTRIBUTION

Feedback revealed mixed feelings towards financially contributing to the setting-up and upgrading of the databases.

The reasons for concern:

- The legal availability of the data (no copyright)
- The cost, delivery-time and accuracy of the data

4.3.1.4 d. DATABASE MANAGEMENT

A majority of responses indicate authorities prefer to manage the databases themselves (for collecting and updating). They are however, willing to provide regular updates.

Overall conclusions about futures research topics are presented in section 8: General conclusion.

Please refer to Appendix 2: Task 2 report.

5 Partners and competitors

Not delivered in this document.

6 Lobbying actions

Not delivered in this document

7 Intelligent Highway Workshop

WORKSHOP on
Intelligent highways - expectations and requirements

25th October, 2007

La Maison de l'Automobile, 46 boulevard de la Woluwe, Brussels, BE

PROGRAMME

25th October 2007

09h30	Registration *with coffee*
10h00	Welcome words and Introduction of the wokshop
	Claude Van Rooten, FEHRL / BRRC *Steve Phillips*, FEHRL
10h15	FEHRL Scientific Program
	Karl-Josef Höhnscheid, Bast
	THREE KEY RESEARCH DOMAINS
10h35	Domain I - Greener
	Margit Noll, arsenal research topics: integrated vehicle infrastructure simulation to assess fuel consumption; energy efficient route planning; eHorizon ; smart drives 4 smart cars; heavy vehicles and energy efficiency – concepts for the future; ITS for greener transport
11h00	Domain II - Safer
	Marie-Line Gallenne, LCPC topics: road diagnosis, communication, information, risk to user, preventive and corrective action and behavior evaluation; assessment of ten French projects and classification of the relevant European projects to identify what topics are more concerned, with the objective to check European similarity
11h25	Coffee break
11h45	Domain III - Smarter
	Paul Kompfner, ERTICO topic: Project CVIS and other related aspects *Xavier Cocu*, BRRC topic: A Vision of Intelligent Roads created by project INTRO
12h15	Synthesis of acquired knowledge needs and requirements for further research
	Fleur Breuillin, MEDAD / SG / DRAST / Mission Transports topic: French Ministry views *Paul Fanning*, University College Dublin topic: Results of the RODRIGUE initiative questionnaire
12h40	Lunch

12h40	Lunch
14h00	Main research and development axis for further research *Philippe Lepert* , LCPC
	INTERACTIVE PART: APPLICATIONS OF V2I TO......
	Chairman: *Peter Maurer,* arsenal research
14h20	1. Safety enhancement
14h40	2. Pavement maintenace management
15h00	3. Greening management
15h20	4. Road capacity management
15h40	Conclusions *Steve Phillips*, FEHRL
16h00	End of the workshop

Presentations can be found at :

http://www.fehrl.org/index.php?m=32&id_directory=691

8 General conclusion

In a synthesis, identified research needs are as following [related to RODRIGUE topics when consistent][1]:

8.1 To adapt past and future projects solutions in relation with stakes and resources [Diagnosis, Communication, Information, Risk]:

- On motorways and highways with high traffic, high safety can be achieved with high equipment of road and vehicles ; cost efficiency is easier to assess than for lower traffic roads.
- On highways and rural roads with low traffic, high equipment of road for information of drivers is not possible from an economic point of view. High equipment of vehicles provides optimal safety by giving the driver macroscopic information or warnings (maps with safety attributes, weather conditions…), in a stand-alone way with minimal roadside equipment.
- Besides stakes deeply differ from one country to another: relative importance of freezing, road network size, existing information devices, relative use of rule vs. incentive measures, policy priorities, etc.

8.1.1.1 To insure coherence in application of rules and consistence of information or action [Information, Risk, Action]:

- New methods ands systems to assist drivers in following the rules may be developed: inter vehicle distance, traffic lights information… In this framework, there's work to be done about data updating procedures and certification of real-time information in electronic maps: as legal speed is provided to driver, it must be the same as indicated on roadside signs. Question about temporary signs due to road works is a major topic.
- Warnings have to be delivered only when truly appropriate with respect to risk assessment and legal rules: for instance, a maximum recommended speed of 70 km/h should not be provided to driver when legal speed limit is 50 km/h.
- Generation of warnings of excessive speed near crossroads or generation of vehicle category specific warnings have been identified in SAFEMAP as needed applications.

8.1.1.2 To improve knowledge about driver [Information, Risk, Action, Evaluation]:

- Research remains to be done about driver behaviour according to driver type (aged, driver with no experience, bikers…) in nominal and adverse conditions. Knowledge of driver is a prominent stake in development of helpful ADAS or IVIS, as well as in designing useful information.
- In the case of on-board safety devices, potential risk should be taken into account all along development of new systems.

[1] takes into account French districts road administrations interviews and analysis of PREDIT 3 French R&D program (LCPC actions).

8.1.1.3 To improve information restitution to users [Communication, Information, Action]:

- Based on previous projects, work about risk function, risk level assessment and shared reference between user and risk assessment system must be continued. Risk function building is a real theme for further research in order to get more consistent warnings or automatic action by ADAS.
- Road signs typology can be used as in-vehicle HMI symbol as it is a shared language throughout Europe. In this matter there is a strong need for European standardisation.
- Acceptability of various types of HMI has to be further explored as a research topic in future projects, based on existing results (ARCOS or AIDE for example).

8.1.1.4 To achieve common evaluation procedures for road diagnosis and other related devices [Evaluation]:

- Action and information devices will be developed in future projects. Development should include considerations about evaluation of impacts on safety, traffic, behaviour and from an economical and legal point of view. Responsibility transfers from drivers to manufacturers or operators are possibly obstacles to deployment of assistance systems in vehicles and on roadside.
- Standardised evaluation procedures have to be written in order for authorities or users to be able to assess efficiency, certify operability and compare one to each other system that fulfil the same function.

8.1.1.5 To achieve high quality statistical road diagnosis [Diagnosis]:

- By comparing road characteristics and weather conditions with actual accidents and near accidents data, researchers will be able to assess risk level for given characteristics of road section. This work has not been done in past research at a European scale, due to lack of compatibility between data gathered by European countries.
- Such researches will enable operators and automatic systems to specify conditions when to warn a driver or road authorities on a local basis.
- European Commission launched a call for proposals DaCoTA (Road safety **Da**ta **Co**llection, **T**ransfer and **A**nalysis), for policy support (call text can be found in appendix 3)

8.1.1.6 To manage data [Diagnosis, Communication]:

- Huge amounts of individual data will be used in future vehicle data collection systems. Before data collection itself, studies have to be made about which data are useful, and the material means necessary to store and handle them. The business model has to be thought about.
- Data collection means and acceptance have to be studied, including legal aspects about individual data handling. For instance, US point of view is that a third body is necessary between drivers (whose vehicle data are collected) and authorities or operators (who use these data to enhance safety and traffic management): this body gather individual information and provides aggregated statistically significant information.

Appendices

Appendix 1 Project review

Appendix 2 Users' needs

Appendix 3 DaCoTA Call text

9 Appendix 1 : Project Review

Task 1

9.1 Introduction

9.1.1 Task objective

RODRIGUE is a cooperative action of the FEHRL, which aims at preparing a proposal on Vehicle-Infrastructure Dialogue for Road Safety for the FP7. The first task of this action is to draw an inventory of recent and on going projects, both national and European, with specific results and outputs relevant to the scope of RODRIGUE (see Appendix).

RODRIGUE borders on different topics, which, for the sake of this task, will be classified in the six following areas:

Topic 1	**DIAGNOSIS** (of infrastructure)	How to measure and map road characteristics (visibility, skid resistance, geometry) and how they influence trajectories... DIAGNOSIS is considered at two levels: L1: measurement and mapping of road characteristics and conditions L2: statistical and static assessment of danger (link with accidentology) and correlation with road conditions (including observation of trajectories).
Topic 2	**COMMUNICATION**	How to share information (Vehicle to Vehicle, Infrastructure to Infrastructure, Vehicle to Infrastructure)
Topic 3	**INFORMATION**	How to provide information to users (traffic control devices, VMS, signals, on-board messages, HMI...)
Topic 4	**RISK** (to users)	How to assess risk of accident (in curves, at intersections, because of headway...) and give warning. RISK deals only with real time assessment.
Topic 5	**ACTION** (preventive or corrective)	How to assist driver to prevent accidents (by acting on the speed or the brakes...)
Topic 6	**EVALUATION**	How to assess impact of cooperative systems on behaviour (relevance, efficacy, acceptability...)

9.1.2 Task organization

The project review is organized in three sections:

- Section 2.1 is an overview table which gives a bird's eye view of every project that was found to be relevant to RODRIGUE.

- Section 2.2 provides a one-page card for each project listed in the previous table, with a short description of the project and how it is relevant to RODRIGUE.

9.2 Section 2.1. Overview Table

Ref	Name	Project Type	Main Research Topic	Relevance to RODRIGUE Topics					
				DIAGNOSIS	COMMUNICATION	INFORMATION	RISK	ACTION	EVALUATION
A. European projects relevant to RODRIGUE									
A.1	AIDE	EUR	Adaptive Integrated Driver-Vehicle Interface			X			X
A.2	Com2React	EUR	establish a multi-level, scalable cooperative system involving two-way vehicle to vehicle (V2V) and vehicle to centre (V2C) communication		X		x		
A.3	Connect	EUR	- Stimulate a harmonized and synchronized deployment of ITS systems and services on the Trans-European Road Network (TERN). - Contribute to convergence between national/ regional planning and the overall implementation of the Information Society in the road transport field in Europe.	X		X			
A.4	Coopers	EUR	Cooperative Systems for Intelligent Road Safety.		X				
A.5	COST 352	EUR	Testing the influence of In-Vehicle Information Systems on driver behaviour and connected with that changes of road safety.						X
A.6	COVER	EUR	specification and implementation of the cooperative COVER Platform including a semantic-based, Context-Sensitive and a Multimodal Rendering components Needs more information		X	X			
A.7	CVIS	EUR	- System concept and open architecture connecting in-vehicle, traffic management systems and roadside telematics services. - Techniques for enhanced vehicle positioning. - Extended protocols for vehicle, road and environment monitoring.		X				X
A.8	eImpact	EUR	eIMPACT assesses the socio-economic effects of Intelligent Vehicle Safety Systems (IVSS), their impact on traffic safety and efficiency.						X
A.9	Frame	EUR	Develop a European ITS framework architecture		X				

Ref	Name	Project Type	Main Research Topic	Relevance to RODRIGUE Topics					
				DIAGNOSIS	COMMUNICATION	INFORMATION	RISK	ACTION	EVALUATION
A.10	Friction	EUR	Sensor fusion and data analysis, sensors management (development of on board system for measuring and estimating actual road friction)	**X**	x		x		
A.11	GST	EUR	To create an environment in which innovative telematics services can be developed and delivered cost effectively and hence to increase the range of economic telematics services available to manufacturers and consumers		**X**				
A.12	HeavyRoute	EUR	Apply and combine existing and newly developed systems, technologies, databases and models to develop advanced HGV management and route guidance systems.	**X**		x	x		
A.13	Hermes	EUR	Investigate the reliability and feasibility of a draft standard proposed by CEN that defines EFI Index for a tyre/road friction coefficient and specifies the procedure for calibrating measuring devices based on that scale.	**X**					
A.14	Highway	EUR	HIGHWAY is to offer higher safety and location-based value added services where interactions between the person in control, the vehicle and the information infrastructure are addressed in an integrated way.		x	x			
A.15	INTRO	EUR	- Develop innovative methods to increase the capacity of road infrastructure and maximize safety of all users. - Combine sensing technologies and local databases with real-time networking technologies.	**X**		**X**			
A.16	I-Way	EUR	The goal of I-WAY is to develop a multi-sensorial system that can ubiquitously monitor and recognize the psychological condition of driver as well as special conditions prevailing in the road environment.	x	**X**	**X**			
A.17	PreVENT	EUR	Develop, demonstrate, test and evaluate preventive safety applications, using advanced sensor, communication and positioning technologies integrated into on-board systems for driver assistance.	see below					

Ref	Name	Project Type	Main Research Topic	Relevance to RODRIGUE Topics					
				DIAGNOSIS	COMMUNICATION	INFORMATION	RISK	ACTION	EVALUATION
A.17 .1	PreVENT / Maps&ADAS	EUR	Use digital maps as primary and/or secondary sensors for ADAS: standardized interface, attributes.	x		x			x
A.17 .2	PreVENT / Saspence	EUR	Develop technical solutions for low-cost enhanced vehicle "intelligence" through an integration of components available in today's passenger cars.	x		**X**	**X**		
A.17 .3	PreVENT / WillWarn	EUR	Develop, integrate and validate a safety application to warn the driver whenever a safety-related critical situation occurs beyond the driver's field of view.		x	**X**	**X**		
A.18	REACT	EUR	Realizing Enhanced Safety and Efficiency in European Road Transport.	**X**	x		**X**		
A.19	SafeSpot	EUR	- Understand how intelligent vehicles and intelligent roads can cooperate to produce a breakthrough for road safety. - Prevent road accidents developing a Safety Margin Assistant that detects in advance potentially dangerous situations and that extends in space and time drivers´ awareness of the surrounding environment.	see below					
A.19 .1	SafeSpot / SP1&2	EUR	SAFEPROBE - In-vehicle sensing and platform. INFRASENS - Infrastructure sensing and platform.	x	x	x		x	
A.19 .2	SafeSpot / SP3	EUR	SINTECH - Innovative technologies.	x	x	x			
A.19 .3	SafeSpot / SP4&5	EUR	Cooperative systems applications, vehicle based (SCOVA) and infrastructure based (COSSIB).	x	**X**	x			
A.20	Sevecom	EUR	SeVeCom (Secure Vehicular Communication) is an EU-funded project that focuses on providing a full definition and implementation of security requirements for vehicular communications.		**X**				
A.21	SpeedAlert	EUR	Harmonize the in-vehicle speed alert concept definition.	x		**X**			
A.22	VERTEC	EUR	Increase vehicle active safety by means of a fully integrated model for behaviour prediction in potentially dangerous situations.						**X**

Ref	Name	Project Type	Main Research Topic	Relevance to RODRIGUE Topics					
				DIAGNOSIS	COMMUNICATION	INFORMATION	RISK	ACTION	EVALUATION
A.23	WatchOver	EUR	Design and develop of a cooperative system for the prevention of accidents involving vulnerable road users in urban and extra-urban areas.				**X**		
B. National projects relevant to RODRIGUE									
B.1	Cooperative systems	AT	Dynamic recognition of road conditions and dangerous spots with gathered CAN Bus data using cooperative systems.	**X**			**X**		
B.2	Highway3	AT	Increase of road safety and the improvement of the traffic flow on a motorway section introduced by a test installation of a cooperative system.	**X**	x	**X**	x		x
B.3	MARVin	AT	Establish links between road accidents and road characteristics and condition.	**X**			x		x
B.4	ARCOS	FR	Enhance driving safety on the basis of four safety functions (inter-vehicle distances, collisions, lane departure, accident warning).	x	x	x	**X**	**X**	x
B.5	DIVAS	FR	Build a global concept of vehicle-infrastructure information exchange system for enhanced traffic safety.	x	x	x	**X**		x
B.6	LAVIA	FR	Evaluate a French Intelligent Speed Adaptation system in operation: driver acceptance, usage, usability and benefits on road safety.			x		x	**X**
B.7	Prevensor	FR	Design ergonomic ADAS to prevent lane-departure.				**X**	x	**X**
B.8	SARI	FR	Provide roadside information to enhance drivers' ability to anticipate difficulties on rural roads.	x		**X**	x		**X**
B.9	SafeMap	FR+ DE	Assess the socio-economic effectiveness of a digital map including additional data relevant for safety.	**X**			x		
B.10	INVENT	DE	Intelligent traffic and user-friendly technology	see below					
B.10 .1	INVENT/FUE	DE	Detection and Interpretation of the driving environment (part of the research initiative INVENT)				**X**		

Ref	***Name***	***Project Type***	***Main Research Topic***	***Relevance to RODRIGUE Topics***					
				DIAGNOSIS	**COMMUNICATION**	**INFORMATION**	**RISK**	**ACTION**	**EVALUATION**
B.10 .2	INVENT/FVM	DE	Driver behaviour and human-Machine interaction (part of the research initiative INVENT)			**X**			**X**
B.10 .3	INVENT/STA	DE	Design congestion assistant to reduce the burden on the driver and improve driving safety (part of the research initiative INVENT)		x			**X**	
B.10 .4	INVENT/VRA	DE	Traffic impact, legal issues and acceptance of driver assistance systems (part of the research initiative INVENT)						**X**
B.10 .5	INVENT/VAS	DE	Anticipatory Active Safety (part of the research initiative INVENT)					**X**	
B.11	Central Transport Database	PL	Database on road parameters, traffic accidents and weather conditions, with video monitoring, geo-positioning.	**X**					
B.12	Infrastructure and road safety	NL	Continuation of SWOV: R-2002-19 project “The analysis of crash, road, and traffic features of the Netherlands state roads”	**X**					
B.13	Measures for speed control	NL	Contribute to a deeper understanding of the (cost)-effectiveness of various measures and combinations of measures to achieve desired safe traffic behaviour.			x	x		
B.14	BAMADAS	NL	Behavioural analysis and modelling for the design and implementation of advanced driver assistance		x	**X**			**X**
B.15	VMS policy development: Graphical congestion display	UK	To develop a road side VMS for congestion and journey time information.			x			
B.16	Innovative Traffic Management Technique/Product assessment	UK	Evaluation of sensors and display modes for road side warnings in case of temporary traffic management operations	x		x			**X**
B.17	Developing Safenet for rural roads	UK	To develop a predictive model for frequency of personal injury road accidents in rural areas.				**X**		

Ref	Name	Project Type	Main Research Topic	Relevance to RODRIGUE Topics					
				DIAGNOSIS	COMMUNICATION	INFORMATION	RISK	ACTION	EVALUATION
B.18	Improved risk assessment for surface condition	UK	To develop a better understanding of the interaction between skid resistance and accident risk.	X			X		x
B.19	Long term safety & effectiveness study – Safety messages on VMS	UK	Include an off road trial to measure the effectiveness of safety messages displayed in VMS			X		x	x
B.20	Dynamic Road Marking – feasibility study	UK	Needs more information						
B.21	Dynamic Road Marking - evaluation	UK	Investigation into dynamic road marking technology			x			x
B.22	Design Guidelines for In-Vehicle Information Systems Producers	UK	To provide guidelines for IVIS producers			X			
B.23	APVRU	UK	Advanced Protection of Vulnerable Road Users	x				x	
B.24	PROBE-IT	UK	Probe Vehicle Information for Traffic Management and Road Network Operations	x	X	x			
B.25	Intelligent Speed Adaptation Project	UK	Intelligent Speed Adaptation			x			X
B.26	Development of Human-Machine Interaction (HMI) Standards	UK	Needs more information						x
B.27	Simulator Standardised Assessment of IVIS	UK	Needs more information						x
B.28	Intelligent Vehicle - Intelligent Roads: Road Traffic Advisor	UK	To provide technical input for diagnosis and driver information		x	X			
B.29	EDmap	US	- Identify the map accuracy and attributes required for high-benefit vehicle safety applications. - Understand the commercial feasibility of providing maps with this extra information.	x		x	x		

Ref	Name	Project Type	Main Research Topic	Relevance to RODRIGUE Topics					
				DIAGNOSIS	COMMUNICATION	INFORMATION	RISK	ACTION	EVALUATION
B.30	Quantification of the effects of different types of construction, design and operation on the safety of country roads	DE		**X**					
B.31	Road safety manual	DE							**X**
B.32	Connection between distribution of speed and event of the accident on country roads - concept study	DE		x					**X**
C. Examples of projects considered not relevant to RODRIGUE									
	PEPPER	EUR	Police Enforcement Policy and Programmes on European Roads.					X	
	Recognisable layout and predictable behaviour	NL	Investigate the way in which the physical and "psychological" features of a road can increase the recognition and predictability in order to provoke the desired (safe) behaviour and to make undesirable (unsafe) behaviour less likely						x
	Design guidance on road studs	UK	Assessment of the performance of active and passive roadstuds; study of their impact on safety.			x			x
	RALF	UK	Radar-controlled Automatic Lane Following → seems to deal only with in-vehicle lane-following; out of the scope of RODRIGUE						
	100Car	US	Provide vital exposure and pre-crash data necessary for understanding causes of crashes and developing crash avoidance countermeasures. → describes naturalistic driving situations. Interesting as a base for evaluation.				x		**X**

9.3 Section 2.2. Individual Project Cards

Project card	***A.1 Aide***
General Info	**Start date:** 2004-03-01 **End date:** 2008-02-29 **Duration:** 48 months **Project Reference:** 507674 **Project cost:** 12,615,029 EURO **Project Funding:** 7,300,000 EURO **Programme Acronym:** FP6-IST **Programme type:** Sixth Framework Programme **Subprogramme Area:** eSafety of road and air transports **Contract type:** Integrated Project **URL:** http://www.aide-eu.org Other participants are OEMs (Fiat, Renault, PSA, BMW, DaimlerChrysler, Ford, Seat, Opel), suppliers (Bosch, Telenostra, Nuance, SiemensVDO, Motorola), institutes (ICCS, JRC, TNO, VTT, CIDAUT, INRETS, CTAG, Hellenic Institute of transports), universities (Stuttgart, Genova, Linköing, Leeds), SME (Kite Solutions) and Ertico.
Key Objectives	- Maximise the efficiency, and hence the safety benefits, of advanced driver assistance systems. - Minimise the level of workload and distraction imposed by in-vehicle information systems and nomad devices. - Enable the potential benefits of new in-vehicle technologies and nomad devices in terms of mobility and comfort.
Key Activities	- SP1: Behavioural Effects and Driver-Vehicle-Environment Modelling - SP2: Evaluation and Assessment Methodology - SP3: Design and Development of an Adaptive Integrated Driver-vehicle Interface - SP4:Sub-project 4: Horizontal Activities
Relevance to RODRIGUE	
RODRIGUE Topic	*Output relevant to the RODRIGUE Topic*
1. DIAGNOSIS	
2. COMMUNICATION	
3. INFORMATION	Overall working theme is the development of adaptive driver-vehicle interface.
4. RISK	
5. ACTION	
6. EVALUATION	SP2 assesses the driver's perception, his mental workload, his state and his driving workload
Project reports, deliverables and recommendations *(relevant to RODRIGUE)*	
Report 2.1.3	Scenario Descriptions - Present a review of issues relevant to the field of testing environments (scenarios, simulators and/or driving environments, cohorts, use cases, etc.).
Report 2.3.1	Functions describing the relations between behaviour and risk - Identify the relationships between driving behaviour and accident risk (identify driving parameters that can formulate a risk assessment).
Report 2.3.2	Trade-offs between behaviour and risk - How to get to an estimate of accident risk that incorporates both driver state (e.g., his momentary workload level or level of alertness) and his driving performance as expressed in commonly used parameters like speed and lane positioning accuracy.
Project's future perspectives	
Standardization	Results of the AIDE project will be presented to ISO experts to discuss their relevance or usability for future standardization activities.

Contributor: VTI, Erdyn consultants

Project card	*A.2 Com2React*
General Info	FP6 project – on going, following of REACT project Participants: Motorola Israel (Coordinator), ARTTIC, Transver, TUM, INRIA, ARMINES, PSA, Everis, Intempora, Jerusalem Transport, Sphericon, Telefonica I+D, Navteq Contact: Mr. Chanan Gabay (Motorola Israel), chgabay@motorola.com)
Key Objectives	COM2REACT will establish a multi-level, scalable cooperative system involving two-way vehicle to vehicle (V2V) and vehicle to center (V2C) communication, which will facilitate significant improvements in the flow of information acquired by moving vehicles, its quality and reliability, thereby enhancing road efficiency and traffic safety on urban, intercity arterials, and rural roads.
Key Activities	The specific scientific and technological objectives of the COM2REACT project are as follows: 1. Develop the technology for virtual sub-centre (VSCs) – The intermediate VSC layer between vehicles and traffic control centres is the core of the COM2REACT system. It is a real breakthrough - as far as is known, no distributed programs are underway (in a peer-to-peer mode) on top of an ad hoc network implementing a concrete traffic application. 2. Develop traffic state, accident risk, and environmental state analysis and prediction models and performance evaluation tools for a VSC. 3. Adapt communication technology - In-car communication system - Vehicle to vehicle communication system - Vehicle to center communication
Relevance to RODRIGUE	
RODRIGUE Topic	*Output relevant to the RODRIGUE Topic*
1. DIAGNOSIS	
2. COMMUNICATION	Adapt communication technology
3. INFORMATION	
4. RISK	Develop traffic state, accident risk, and environmental state analysis and prediction models and performance evaluation tools for a VSC
5. ACTION	
6. EVALUATION	
Project reports, deliverables and recommendations *(relevant to RODRIGUE)*	
Project's future perspectives	

Contributor: Erdyn consultants

Project card	*A.3 Connect*
General Info	DG TREN, May 2004 - September 2008 Programme TEMPO http://www.connect-project.org Contact info: bmvit - Federal Ministry of Transport, Innovation and Technology (Austria) Mr. Werner Kovacic Phone +43 / 1 / 71162 1100 Fax +43 / 1 / 71162 1199 E-Mail werner.kovacic@bmvit.gv.at
Key Objectives	Improve cross-border traffic and transport through implementing harmonised and synchronised ITS applications on the high-level road network in Central and Eastern Europe.
Key Activities	- Elaborate monitoring plans. - Upgrade fixed and mobile data capture stations. - Implement Traffic Information Centres. - Develop VMS and web-based information services.
Relevance to RODRIGUE	
RODRIGUE Topic	*Output relevant to the RODRIGUE Topic*
1. DIAGNOSIS	New tools for diagnosing traffic conditions
2. COMMUNICATION	
3. INFORMATION	Tools for providing information on weather conditions, road works, traffic volumes, accidents and predicted travel time
4. RISK	
5. ACTION	
6. EVALUATION	
Project reports, deliverables and recommendations *(relevant to RODRIGUE)*	
Project's future perspectives	
CONNECT activities will be continued within EasyWay Europe-wide project until the year 2013.	

Contributor: IBDIM

Project card	***A.4 Coopers***
General Info	FP6 InfSo, 2006-2010, coordinated by Austria Tech (Austria) **Start date:** 2006-02-01 **End date:** 2010-01-31 **Duration:** 48 months **Project Reference:** 026814 **Project cost:** 16,801,755 € **Project Funding:** 9,799,210 € **Programme Acronym:** FP6-IST **Programme type:** FP6 **Subprogramme Area:** eSafety Co-operative Systems for Road Transport **Contract type:** Integrated Project http://www.coopers-ip.eu Contact info: Austriatech, Mr. Alexander Froetscher, +43-1-263344464
Key Objectives	Enhance of road safety by direct and up to date traffic information communication between infrastructure and motorised vehicles on a motorway section.
Key Activities	Development of innovative telematics applications on the road infrastructure with the long term goal of a "Co-operative Traffic Management" between vehicle and infrastructure, to reduce the self opening gap of the development of telematics applications between car industry and infrastructure operators.
Relevance to RODRIGUE	
RODRIGUE Topic	*Output relevant to the RODRIGUE Topic*
1. DIAGNOSIS	
2. COMMUNICATION	Innovative telematics applications for cooperative traffic management.
3. INFORMATION	
4. RISK	
5. ACTION	
6. EVALUATION	
Project reports, deliverables and recommendations *(relevant to RODRIGUE)*	
IR 2300/2400/2500	Overall requirements: Information guide for demonstrator; HMI guideline extensions; Report on safety; assessment of services; User groups & needs analysis (by the end of 2007)
D7-B5300/5400	Test bench for I2V interfaces, including test vehicle, testing environment and test database (by the end of 2007).
Project's future perspectives	

Contributor: LCPC

Project card	***A.5 COST 352***
General Info	"Influence of Modern In-Vehicle Information Systems on Road Safety Requirements" Coordinator: Michael Bernhard (Bluewin, Switzerland) - m_bernhard@bluewin.ch http://cost352.epfl.ch/ Project end in September 2008
Key Objectives	Investigate the influence of In-Vehicle Information Systems on road safety
Key Activities	- Inventory of previous and current researches on this topic. - The action covers several application areas, which require specific scientific research depending on the nature of the source of information as well as their respective interaction, as follows: in-vehicle information and guidance devices, electronic messaging, mobile telephone systems, entertainment, human information processing. - Inform policy makers and industry about how to respond to the increasing range and availability of In-Vehicle Information Systems equipment
Relevance to RODRIGUE	
RODRIGUE Topic	*Output relevant to the RODRIGUE Topic*
1. DIAGNOSIS	
2. COMMUNICATION	
3. INFORMATION	
4. RISK	
5. ACTION	
6. EVALUATION	Assessment of how In-Vehicle Information Systems contribute to driver distraction in road environments where outside information is normally provided and creation of a scientific base for: - safety evaluation methodology, - rules for drivers education and training, - road traffic and vehicle equipment legislation in the relevant area.
Project reports, deliverables and recommendations *(relevant to RODRIGUE)*	
Project's future perspectives	

Contributor: IBDIM

Project card	***A.6 COVER***
General Info	**Start date:** 2006-03-01 **End date:** 2009-02-28 **Duration:** 36 months **Project Reference:** 027060 **Project cost:** 4,137,330 € **Project Funding:** 2,244,000 € **Programme Acronym:** FP6-IST **Subprogramme Area:** eSafety Co-operative Systems for Road Transport **Contract type:** Specific Targeted Research Project **URL:** http://www.ist-cover.org (http://www.ist-cover.eu ?) Contact person: Jussi Kiuru, TIELIIKELAITOS, +35405054583
Key Objectives	COVER is to foster the creation of the next generation intelligent cooperative systems that will make road transport more efficient and effective, safer and more environmentally friendly.
Key Activities	
Relevance to RODRIGUE	
RODRIGUE Topic	*Output relevant to the RODRIGUE Topic*
1. DIAGNOSIS	
2. COMMUNICATION	
3. INFORMATION	
4. RISK	
5. ACTION	
6. EVALUATION	
Project reports, deliverables and recommendations *(relevant to RODRIGUE)*	
	NB : no more information available
Project's future perspectives	

Contributor: Erdyn consultants

Project card	***A.7 CVIS***
General Info	"Cooperative Vehicle-Infrastructure Systems" FP6, 2006-2010, coordinated by Ertico (Belgium) **Start date:** 2006-02-01 **End date:** 2010-01-31 **Duration:** 48 months **Project Reference:** 027293 **Project cost:** 41,155,203 € **Project Funding:** 21,905,795 € **Programme Acronym:** FP6-IST **Subprogramme Area:** eSafety Co-operative Systems for Road Transport **Contract type:** Integrated Project www.cvisproject.org Contact person: Mr Paul Kompfer, +32-2-4000732
Key Objectives	CVIS mainly aims at integrating cooperative systems in transport efficiency, secondary objective is to enhance driving safety
Key Activities	- Innovative technologies (localisation, communication) (POMA, FOAM, COMM) - Infrastructure and vehicle based application (CURB, CF&F,C-INT + COMO) - Test site
Relevance to RODRIGUE	
RODRIGUE Topic	*Output relevant to the RODRIGUE Topic*
1. DIAGNOSIS	Topic of Subproject POMA is related to map architecture and location devices. Location accuracy is about 1 m and should enable application focusing on the lane level accuracy
2. COMMUNICATION	CVIS has a main topic dealing with the communication, developing a multi vector platform for V2V and V2I communication
3. INFORMATION	Information to the user is brought by an on board unit
4. RISK	
5. ACTION	Mostly warning
6. EVALUATION	
Project reports, deliverables and recommendations *(relevant to RODRIGUE)*	
Project's future perspectives	

Contributor: BRRC

Project card	***A.8 eIMPACT***
General Info	**Start date:** 2006-01-01 **End date:** 2007-12-31 **Duration:** 24 months **Project Reference:** 027421 **Project cost:** 2519993 EURO **Project Funding:** 1598391 EURO **Programme Acronym:** FP6-IST **Subprogramme Area:** eSafety Co-operative Systems for Road Transport **Contract type:** Specific Targeted Research Project **URL:** http://www.eimpact.info Contact info: Dr. Kerry K.M. MALONE, TNO, +31-15-2696912 Partners: TNO, University of Cologne, DaimlerChrysler AG, Centro Ricerche Fiat, BMW Forschung und Technik GmbH, Robert Bosch GmbH, PTV Planung Transport Verkehr AG, VTT Technical Research Centre Of Finland, Bundesanstalt für Straßenwesen, Rijkswaterstaat Adviesdienst Verkeer en Vervoer (RWS-AVV), Czech Transport Research Centre, MoveaTrafikkonsult AB, Irion Management Consulting GmbH.
Key Objectives	The socio-economic impact assessment, developed in the SEiSS project (2005), plays a central role in this project and will be extended in eIMPACT to address stakeholder-specific issues. All other work packages and tasks are defined in relation to the socio-economic impact assessment. The output will be an assessment of the socio-economic impact including a picture of the costs and benefits for the stakeholders and the macroeconomic effects.
Key Activities	Activities: - Identify the most promising stand-alone and co-operative IVSS technologies. - Develop scenarios for IVSS for the years 2010 and 2020. - Assess impact of IVSS traffic safety and efficiency in these scenarios. - Identify policies to enable the implementation of IVSS Workpackages: WP 1000: Intelligent Vehicle Safety Systems WP 2000: Evaluation Frame and Socio-economic cost-benefit analysis WP 3000: Impact Assessment of IVSS WP 4000: Policy Options for facilitating market introduction WP 5000: Stakeholder analysis and overall evaluation results
Relevance to RODRIGUE	
RODRIGUE Topic	*Output relevant to the RODRIGUE Topic*
1. DIAGNOSIS	
2. COMMUNICATION	
3. INFORMATION	
4. RISK	
5. ACTION	
6. EVALUATION	The output will be an assessment of the socio-economic impact including a picture of the costs and benefits for the stakeholders and the macroeconomic effects
Project reports, deliverables and recommendations *(relevant to RODRIGUE)*	

Project's future perspectives	

Contributor: Erdyn consultants

Project card	***A.9 FRAME***
General Info	"FRamework Architecture Made for Europe" – projects Frame-Net and Frame-S FP5 DG INFSO, 2001-2004, coordinated by Ertico (Belgium) http://www.frame-online.net Consortium: AFT-IFTIM (France), Department for Transport (UK), DSCR - Direction de la sécurité et de la circulation routière (France), ERTICO (Belgium), Mega International (France), MIZAR Automazione (Italy), MIT - Ministero delle Infrastrutture e dei Trasporti (Italy), National University of Athens (Greece), NEI - Ecorys (Netherlands), Politecnico di Torino (Italy), Rijkswaterstaat - AVV (Netherlands), Siemens Traffic Controls (UK), Swedish National Road Authority (Sweden), TNO (Netherlands), Traficon Ltd. (Finland), University of Leeds (UK), VTT (Finland) Project Leader for FRAME-NET: Jan Willem Tierolf, Rijkswaterstaat – AVV, +31 10 2825879 Project Leader FRAME-S: Richard Bossom, Siemens Traffic Controls, +44 1202 782216
Key Objectives	Definition of guidelines for the European ITS Framework Architecture
Key Activities	The main activities of the FRAME Projects was to make updates and improvements to the European ITS Framework Architecture defined by the KAREN Project and to provide various forms of support with seminars and training workshops, international meetings and events, brochures, reports and technical documents.
Relevance to RODRIGUE	
RODRIGUE Topic	*Output relevant to the RODRIGUE Topic*
1. DIAGNOSIS	
2. COMMUNICATION	European ITS Framework Architecture specifications. Guidelines should assure compatibility and interoperability at national and European level.
3. INFORMATION	
4. RISK	
5. ACTION	
6. EVALUATION	Evaluation of cons and ads of architecture
Project reports, deliverables and recommendations *(relevant to RODRIGUE)*	
ITS Architecture	European ITS Framework Architecture version 3 http://www.frame-online.net/library.htm
Project's future perspectives	

Contributor: UniFi

Project card	***A.10 Friction***
General Info	FP6 IST (continuation of FP5 Appolo) 01/2006-12/2008, coordinated by VTT (Sweden) **Start date:** 2006-01-01 **End date:** 2008-12-31 **Duration:** 36 months **Project Reference:** 027006 **Project cost:** 4,300,000 € **Project Funding:** 2,599,732 € **Programme Acronym:** FP6-IST **Subprogramme Area:** eSafety Co-operative Systems for Road Transport **Contract type:** Specific Targeted Research Project http://friction.vtt.fi/ Consortium: VTT, CRF, IBEO, Ika-Rwth, Magnetti-Marelli, Nokian tyres, Pirelli, Siemens Vdo, Helsinki University of Technology, Volvo **Coordinator**: Pertti Peussa, VTT, pertti peussa@vtt fi, +358 20 722 3601
Key Objectives	Development of an on-board system for measuring and estimating friction and road slipperiness to enhance the performance of integrated and cooperative safety systems.
Key Activities	- Create an innovative model for an on-board estimation and prediction of tyre-road friction and road slipperiness - Build a prototype system of sensor clustering. - Verify the system benefits by means of selected vehicle applications using friction and road slipperiness information. - Enhance the functionality of preventive and cooperative safety systems applications in parallel running and upcoming Integrated Projects.
Relevance to RODRIGUE	
RODRIGUE Topic	*Output relevant to the RODRIGUE Topic*
1. DIAGNOSIS	- New model for the estimation and prediction of tyre-road friction and road slipperiness. - Definition of the in-vehicle sensors (existing or up-coming) for a prototype system able to measure tyre-road friction.
2. COMMUNICATION	New system of an intelligent low cost sensor clustering with a minimum number of generic sensors.
3. INFORMATION	
4. RISK	
5. ACTION	Development of a new system to enhance driver assistance. Providing a system for different applications and for on-going projects in preventive safety and upcoming systems.
6. EVALUATION	
Project reports, deliverables and recommendations *(relevant to RODRIGUE)*	
Project's future perspectives	

Contributor: UniFi

Project card	***A.11 GST***
General Info	**Start date:** 2004-03-01 **End date:** 2007-03-31 **Duration:** 37 months **Project Reference:** 507033 **Project cost:** 21,499,019 € **Project Funding:** 11,100,974 € **Programme Acronym:** FP6-IST **Subprogramme Area:** eSafety of road and air transports Consortium partners: ERTICO, ADSE, Allianz, Appello, AVE, B2i, BMW, BOSCH, CETECOM, Daimler Chrysler, EBU, Fiat, Ford, France Telecom, Gatespace, GEWI, ISMB, jTEST, Kreis Offenbach, KU LEUVEN, Mizar, Motorola Italy, Navteq, Orange, Petards, Prosyst, PTV, Renault, RSA, SES Global, SRA, 7 Layers, University of Malaga, Sussex Police, TDF, Telcordia, Tele Atlas, Telecom Italia, Telematics Cluster, Telmacon, TNO, Trialog, Trusted Logic, T-Systems, TUM, TUV, Vialis, Viktoria Institute, Volvo, Wireless Car **Contract type:** Integrated Project **URL:** http://www.gstforum.org
Key Objectives	GST's vision is to create an open environment in which innovative telematics services can be developed and delivered cost-effectively. Thereby, the range of services that will become available to manufacturers and consumers will increase.
Key Activities	
Relevance to RODRIGUE	
RODRIGUE Topic	*Output relevant to the RODRIGUE Topic*
1. DIAGNOSIS	EFCD sub project deals with floating car data management
2. COMMUNICATION	Open System subproject ensures that safety related communications are taken into the account. Safety Channel sub-project deals with the concept of priority for safety information in the communication architecture.
3. INFORMATION	Rescue sub-project ensures that correct information is provided to rescue staff and other drivers in case of accident occurrence.
4. RISK	
5. ACTION	
6. EVALUATION	
Project reports, deliverables and recommendations *(relevant to RODRIGUE)*	
Project's future perspectives	

Contributor: Erdyn consultants

Project card	***A.12 HeavyRoute***
General Info	**Start date:** 2006-09-01 **End date:** 2009-02-28 **Duration:** 30 months **Project Reference:** 31461 **Project cost:** 3,281,000 € **Project Funding:** 1,700,000 € **Programme Acronym:** FP6-SUSTDEV **Subprogramme Area:** Sustainable development, global change and ecosystems **Contract type:** Specific Targeted Research Project **Consortium**: Arsenal Research (AT), Ertico, Fehrl, LCPC, Navteq, PTV, VTI, Volvo **Coordinator**: Anita His, VTI, anita.ihs@vti.se Web page: http://heavyroute.fehrl.org/
Key Objectives	Route planning, Driver support, Monitoring of HGVs, Fleet and vehicle management – to provide cost effective systems
Key Activities	Infrastructure measuring, Heavy vehicle Modelling, Traffic simulation and analysis, Risk prediction, Evaluation
Relevance to RODRIGUE	
RODRIGUE Topic	*Output relevant to the RODRIGUE Topic*
1. DIAGNOSIS	Each partner uses his own instruments (LCPC: SCRIM, VANI) to measure them. NAVTEQ is responsible for the mapping.
2. COMMUNICATION	Not yet definitively decided. But there will be communication between INFRA and vehicle.
3. INFORMATION	to provide information to users (traffic control devices, VMS, signals, on-board messages, HMI...), all this techniques, not yet definitively decided
4. RISK	The risk of rollover is studied and an alarm will be given to the driver
5. ACTION	assist driver to prevent accidents by acting on the speed
6. EVALUATION	The WP1 of HV project is about user requirements and to study the acceptability of such systems. Some tests with simulator will be done.
***Project reports, deliverables and recommendations** (relevant to RODRIGUE)*	
D.1.1	Report on State of the art and user requirements
D.1.2	Report on Summary on System architecture and Visions
D.2.1	A report describing available road databases and relevant data
D.2.4	Survey of tools, methods and data concerning vehicle/infrastructure interaction and traffic data measurement
D.2.6	A report on available effect models, including impact of HGV on infrastructure, and requirements for heavy traffic management strategies
Project's future perspectives	
	Real tests on site with heavy vehicle will be programmed to test the global system

Contributor: LCPC

Project card	***A.13 Hermes***
General Info	"Harmonization of European Routine and research Measuring Equipment for Skid Resistance" FEHRL-funded pre-normative project, coordinated by BRRC (Belgium) End: 2006 http://www.fehrl.org/?m=103
Key Objectives	Investigate the reliability and feasibility of a draft standard proposed by CEN that defines EFI Index for a tyre/road friction coefficient and specifies the procedure for calibrating measuring devices based on that scale.
Key Activities	
Relevance to RODRIGUE	
RODRIGUE Topic	*Output relevant to the RODRIGUE Topic*
1. DIAGNOSIS	Linking road conditions data with accident data
2. COMMUNICATION	
3. INFORMATION	
4. RISK	Assessing risk of accident by comparing of various parameters of pavement, infrastructure, and traffic.
5. ACTION	
6. EVALUATION	
Project reports, deliverables and recommendations *(relevant to RODRIGUE)*	
Final report	http://www.fehrl.org/index.php?m=32&id_directory=614
Project's future perspectives	
	Within RODRIGUE, IBDIM would like to: • establish the new method or implement existing method to identify dangerous places for road users which contain research of various features such as road geometry, roughness, friction coefficient, rut depth, vehicle speed, traffic volume and others crucial for road safety. This method will be examined on main roads and its results would be transferred for assessing of low volume traffic roads. • We would like to utilise HERMES findings and our experience in friction coefficient survey and also experience of Austria team from project MARVin. • There would be possible to conduct comparative tests on Polish national road network involving parameters needed for evaluation of dangerous places.

Contributor: IBDIM

Project card	***A.14 HIGHWAY***
General Info	**Start date:** 2004-04-01 **End date:** 2006-12-31 **Duration:** 33 months **Project Reference:** 507260 **Project cost:** 3,020,160 € **Project Funding:** 1,625,000 € **Programme Acronym:** FP6-IST **Subprogramme Area:** eSafety of road and air transports **Contract type:** Specific Targeted Research Project **URL:** http://www.ist-highway.org
Key Objectives	HIGHWAY, through the combination of smart real-time maps, UMTS 3G mobile technology, positioning systems and intelligent agent technology, 2D/3D spatial tools and speech synthesis/voice recognition interfaces will provide European car drivers and pedestrians with eSafety services and at the point of need interaction with multimedia (text, audio, images, real-time video, voice/graphics) and value-added location-based services.
Key Activities	The project will start identifying the user requirements for improved eSafety services, and subsequently it will undertake the definition of a system architecture for open, integrated and secure, geographic, multimedia and multimodal service delivery to satisfy the eSafety needs of European car drivers (and pedestrians). The project team will then carry out the specification and implementation of a set of networked, multimodal and interoperable tools, to acquire, manage and delivery map-based, multimedia (sensor, audio, text, real-time video) information from distributed sources (vehicle, infrastructure, user profiles, other DBs, etc.), exploiting the broadband wireless technology (UMTS, Wi-Fi) technology and the powerful features of intelligent distributed agents and XML-based languages. Finally, HIGHWAY will deliver the specification, implementation and extensive demonstration of innovative, intelligent services devoted to car drivers and pedestrians. By means of the HIGHWAY toolset bound to allow “machine-machine” interaction and not only human consumption of information, a new entire generation of intelligent services, including real-time 2D/3D map delivery, time-variant information and automatic triggering of driver-controlled eSafety mechanism, route guidance, etc. will be implemented.
Relevance to RODRIGUE	
RODRIGUE Topic	*Output relevant to the RODRIGUE Topic*
1. DIAGNOSIS	
2. COMMUNICATION	- Definition of a system architecture for open, integrated and secure, geographic, multimedia and multimodal service delivery to satisfy the eSafety needs of European car drivers (and pedestrians) - Specification and implementation of a set of networked, multimodal and interoperable tools, to acquire, manage and delivery map-based, multimedia (sensor, audio, text, real-time video) information from distributed sources (vehicle, infrastructure, user profiles, other DBs, etc.), exploiting the broadband wireless technology (UMTS, Wi-Fi) technology and the powerful features of intelligent distributed agents and XML-based languages
3. INFORMATION	
4. RISK	
5. ACTION	
6. EVALUATION	
Project reports, deliverables and recommendations *(relevant to RODRIGUE)*	
	http://www.ist-highway.org/public.htm

Project's future perspectives

Contributor: Erdyn consultants

Project card	***A.15 INTRO***
General Info	Intelligent Roads http://intro.fehrl.org/ **Start date:** 2005-03-01 **End date:** 2008-02-29 **Duration:** 36 months **Project Reference:** 12344 **Project cost:** 3,496,456 € **Project Funding:** 1,999,020 € **Programme Acronym:** FP6-SUSTDEV **Subprogramme Area:** Developing technologies to acquire and predict information on infrastructure conditions and parameters **Contract type:** Specific Targeted Research Project Consortium: Arsenal Research, FEHRL, INRETS, ISIS, Prisma Solutions, ROC, VTI, LAVOC-EPFL, TRL, TSS Contact: Bengt Walivaara, VTI, bengt.walivaara@vti.se, +46 13 204208
Key Objectives	Develop innovative methods to increase the capacity of road infrastructure and to maximise the safety and well being of drivers, passengers, crew and pedestrians. These involve the use and combination of existing technologies as well as combining them with developing technologies.
Key Activities	- Surface safety monitoring - Traffic and safety monitoring - Intelligent pavement and intelligent vehicles
Relevance to RODRIGUE	
RODRIGUE Topic	*Output relevant to the RODRIGUE Topic*
1. DIAGNOSIS	- Innovative use and combination of new and existing sensor technologies in pavements and bridges in order to prevent accidents, enhance traffic flows and significantly extend the lifetimes of existing infrastructure. - A prolonged lifetime of high capacity roads could thus be obtained using novel methods for early warning detection of deterioration and damage of road surfaces.
2. COMMUNICATION	
3. INFORMATION	- Integration and testing of real-time warning systems at network level to achieve a significant decrease in the number of accidents due to ”surprise effects” from sudden local changes in weather resulting in low friction and hence skidding. - Increasing drivers´ attention to low road friction by only a few percent may result in significantly higher reduction of accident rates due to its non-linear relationship.
4. RISK	- Combination of different sensor data will enable the estimations of entirely new real-time safety parameters and performance indicators to be used in traffic monitoring and early warning systems.
5. ACTION	
6. EVALUATION	Europe's most advanced driving simulator will be used to optimise for driver responses to new types of information.
Project reports, deliverables and recommendations *(relevant to RODRIGUE)*	
D11 report	State of the Art and User Needs
D21 report	Model for estimating expectable stopping distance
Project's future perspectives	

Contributors: VTI, LCPC

Project card	***A.16 I-WAY***
General Info	Contract Number: IST-4-027195 Project Name: Intelligent co-operative system in cars for road safety List of participants: Elettronica e Sistemi per Automazione - Ele.Si.A SpA(I), LOQUENDO SpA (I), Universidad Politecnica de Madrid (ES), Fondazione IARD (I), DATABLUE (GR), ABM Management Co (I), OHB TELEDATA GmbH (DE), University of Ioannina (GR), TWT GmbH Information & Engineering Technologies (DE), MIP – School of Management (I), SWORD Technologies S.A (Lx), ERIM S.A (FR), GL 2006 Europe (GB), Centro Ricerche Fiat (I) Total Cost 4.655.998,00 € Commission Funding: 2.600.000,00 € Project Start 1st February 2006 http://www.iway-project.eu Contact: i-way@elesia.it
Key Objectives	The goal of I-WAY is to develop a multi-sensorial system that can ubiquitously monitor and recognize the psychological condition of driver as well as special conditions prevailing in the road environment. The I-WAY platform targets mainly road users, but it is a highly modular system that can be easily adapted or break up in stand alone modules in order to accommodate a wide variety of applications and services in several fields of transport, thanks to its interoperability and scalable system architecture.
Key Activities	Wp0: Project Management & Co-ordination Wp1: User Requirements &System Functional Specifications Wp2: Vehicle Sensors and data Acquisition Module development Wp3: Development of the Situation Assessment Module Wp4: Communication Aspects and Mobile Interfaces Wp5: Set Up of Road Infrastructure Wp6: Implementation of the road Management System Wp7: Integration, Testing & on Road Trials Wp8: Dissemination & Exploitation Wp9: Evaluation & Assessment
Relevance to RODRIGUE	
RODRIGUE Topic	*Output relevant to the RODRIGUE Topic*
1. DIAGNOSIS	The vehicle sensing module. It is responsible for the acquisition, processing and analysis of raw data coming from the on-board sensors The data acquisition module. It is responsible for the aggregation, combination and correlation of acquired information provided by the vehicle sensing module and by external sources. The Roadside equipment which is responsible for data acquisition referring to the road environment in locations where vehicles cannot precisely recognize dangerous conditions
2. COMMUNICATION	The communication module that handles the real-time exchange of data among the vehicles with each other and between a specific vehicle and the Road Management system. The Road Management System including an application and a database server which holds and manages the real-time road information
3. INFORMATION	The mobile interfaces of the vehicle. Through these interfaces drivers input and receive significant information regarding accurate traffic jam estimations, weather conditions, the road shape, speed and distance from a vehicle travelling ahead etc.

4. RISK	The situation assessment module. its purpose is to provide estimation of the road situation based on prior knowledge and incoming transient information
5. ACTION	
6. EVALUATION	
Project reports, deliverables and recommendations *(relevant to RODRIGUE)*	
Project's future perspectives	

Contributor: Erdyn consultants

Project card	***A.17.1 PREVENT / Maps&ADAS***
General Info	See Prevent
Key Objectives	The MAPS&ADAS subproject is driven by needs identified by the ADASIS Forum with regard to the use of digital maps as primary and/or secondary sensors for ADAS. • The access to map data by applications other than navigation requires a standardised interface to avoid specific solutions dependent on OEMs and application suppliers. This will enable reduction of implementation costs and near future market introduction • The production of ADAS maps require the procurement of ADAS attributes
Key Activities	To develop, test and validate appropriate methods in gathering, certifying and maintaining ADAS attributes in digital maps.
Relevance to RODRIGUE	
RODRIGUE Topic	*Output relevant to the RODRIGUE Topic*
1. **DIAGNOSIS**	New methods for ADAS attributes acquisition, enabling cost-effective provision of accurate and up-to-date ADAS Maps, compliant to ADAS application requirements
2. **COMMUNICATION**	
3. **INFORMATION**	Deliver speed limit warnings and hot spot warnings
4. **RISK**	
5. **ACTION**	
6. **EVALUATION**	Safety impact assessment of ADAS maps
Project reports, deliverables and recommendations *(relevant to RODRIGUE)*	
Project's future perspectives	

Contributor: Erdyn consultants

Project card	***A.17.2 PreVENT / Saspence***
General Info	See Prevent
Key Objectives	SASPENCE is developing and evaluating an innovative system able to perform the reliable and comfortable Safe Speed and Safe Distance concept, which helps the driver avoid dangerous situations related to excessive speed or too little headway. The system will cooperate seamlessly with the driver through the most suitable HMI channels, and suggest the proper velocity and headway for the given driving conditions. SASPENCE is developing low-cost technical solutions based on component already available in passenger cars.
Key Activities	• ***Data fusion*** for reconstruction of the overall road and obstacle scenario • ***Comparison*** between a computed ***reference manoeuvre*** and the ***actual manoeuvre*** undertaken by the driver • Generation of ***warning messages*** for the driver and feedback on active pedal in order to reach a safe situation
Relevance to RODRIGUE	
RODRIGUE Topic	*Output relevant to the RODRIGUE Topic*
1. DIAGNOSIS	Use existing sensors for road diagnosis. Work is made on data fusion.
2. COMMUNICATION	
3. INFORMATION	Warning for safe distance, safe speed according to legal issues and road and weather conditions.
4. RISK	Compare driving situation with reference manoeuvres.
5. ACTION	
6. EVALUATION	
Project reports, deliverables and recommendations *(relevant to RODRIGUE)*	
Project's future perspectives	

Contributor: Erdyn

Project card	***A.17.3. PreVENT / WillWarn***
General Info	See Prevent
Key Objectives	WILLWARN (Wireless Local Danger Warning) is developing a communication-based system that extends the driver's horizon and intelligently warns the driver of dangerous situations ahead. WILLWARN provides drivers the opportunity to adapt the vehicle speed and inter-vehicle distance early-on, leading to a higher situational awareness of potential unforeseen danger.
Key Activities	The three-year WILLWARN subproject is developing, integrating and validating a safety application that warns the driver whenever a safety-related critical situation occurring beyond the driver's field of view. This includes the development of on-board hazard detection, in-car warning management, and decentralised warning distribution by vehicle-to-vehicle communication on a road network. Positioning, relevance checks, message transport, and on-board message evaluation will enable a low-cost and reliable solution for wireless local danger warnings. The key issues of WILLWARN include: • Improved safety through vehicle-to-vehicle and vehicle-to-infrastructure communication • High benefit for the user even at low equipment rates using cars as relays for transporting messages in a road network • Design of a basic system at low cost
Relevance to RODRIGUE	
RODRIGUE Topic	*Output relevant to the RODRIGUE Topic*
1. DIAGNOSIS	
2. COMMUNICATION	V2V communication module
3. INFORMATION	Hazard warning module and warning message management
4. RISK	Hazard detection module
5. ACTION	
6. EVALUATION	
Project reports, deliverables and recommendations *(relevant to RODRIGUE)*	
Project's future perspectives	

Contributor: Erdyn

Project card	**A.18 REACT**
General Info	"Realizing Enhanced Safety and Efficiency in European Road Transport" **Start date:** 2005-01-01 **End date:** 2006-12-31 **Duration:** 24 months **Project Reference:** 516233 **Project cost:** 3,675,513 € **Project Funding:** 1,999,955 € **Programme Acronym:** FP6-SUSTDEV **Subprogramme Area:** Developing technologies to acquire and predict information on infrastructure conditions and parameters **Contract type:** Specific Targeted Research Project http://www.react-project.org/
Key Objectives	- Sense natural and infrastructure conditions within and in the vicinity of each equipped vehicle, - transmit sensed real-time data to a central server where they will be analyzed by a set of sophisticated prediction and decision-making models, - generate: 1) safety alerts, speed and route recommendations, to be communicated to specific vehicle drivers; 2) relevant information for road and law enforcement authorities.
Key Activities	1) Develop/adapt real time mobile sensors that measure natural and infrastructure conditions (road friction, visibility, traffic, vehicle speed, integration of sensors/indicators). 2) Develop a method for generating in-car recommendations to the driver based strictly on data from the vehicle's in-car sensors (decision making model). 3) Develop state-of-the-art secure communication capability (sensor-to-vehicle and vehicle-to-infrastructure). 4) Develop/adapt analysis, prediction, and decision-making models in a central server (natural and infrastructure prediction, traffic monitoring, safety risk prediction, traffic prediction, decision making).
Relevance to RODRIGUE	
RODRIGUE Topic	*Output relevant to the RODRIGUE Topic*
1. DIAGNOSIS	Mobile sensors
2. COMMUNICATION	Secure communication technologies
3. INFORMATION	
4. RISK	Safety risk prediction models
5. ACTION	
6. EVALUATION	
Project reports, deliverables and recommendations *(relevant to RODRIGUE)*	
Project's future perspectives	

Contributor: LCPC

Project card	***A.19 Safespot***
General Info	"Cooperative vehicles and road infrastructure for road safety" **Start date:** 2006-02-01 **End date:** 2010-01-31 **Duration:** 48 months **Project Reference:** 026963 **Project cost:** 37,627,911 € **Project Funding:** 20,590,972 € **Programme Acronym:** FP6-IST **Subprogramme Area:** eSafety Co-operative Systems for Road Transport **Contract type:** Integrated Project **URL:** http://www.safespot-eu.org
Key Objectives	SafeSpot mainly aims to integrate cooperative systems in transport Safety
Key Activities	- Infrastructure and vehicle new sensors (SP1 and 2) - Innovative technologies (V2V and V2I com, Dynamic Map) (SP 3) - Infrastructure and vehicle based application (SP 4 and 5) - Test site
Relevance to RODRIGUE	
RODRIGUE Topic	*Output relevant to the RODRIGUE Topic*
1. DIAGNOSIS	Map concept in SafeSpot is central and is separated in a multi layer map with each layer becoming more and more accurate and dynamic. However, no research is done to improve static part of the map and gathering of infrastructure characteristics.
2. COMMUNICATION	All media of communication are enabled, V2V and V2I. Project will share development of a platform with CVIS.
3. INFORMATION	Two subprojects are relevant on this point: - in SP4, the information is given on board, - SP5 application could give information using both on board unit and roadside units.
4. RISK	Algorithms to automatically warn driver or traffic information centre are currently restricted to the project. However, detection is automatic and not supervised by a human.
5. ACTION	Actions of application (both SP4 and SP5) to the driver are only warning
6. EVALUATION	Relevance and efficiency have been analyzed at the beginning of the project using car accident database from partner's countries. It will be also evaluated at the end of the project.
Project reports, deliverables and recommendations *(relevant to RODRIGUE)*	
Project's future perspectives	

Contributor: LCPC

Project card	***A.19.1 Safespot - SP 1+2***
General Info	SAFEPROBE and INFRASENS are subprojects of SafeSpot devoted to the sensors. They are intended to finish at T0+36
Key Objectives	The main objective of SAFEPROBE is to develop an interoperable "vehicle probing" system, source of safety related information. INFRASENS is dedicated to development of roadside sensors. Development of new sensors and algorithm to enable application developed in SP4 and SP5 is part of the project.
Key Activities	Definition of use cases and specifications of on-board architecture, useful vehicle internal and external data, data exchange modalities, data fusion, etc. Roadside sensors networks integration, data interpretation algorithms, data fusion, etc.
Relevance to RODRIGUE	
RODRIGUE Topic	*Output relevant to the RODRIGUE Topic*
1. DIAGNOSIS	SP2 sensors are devoted to the road environment sensing, including atmospherical conditions. No research is done on road characteristics.
2. COMMUNICATION	
3. INFORMATION	
4. RISK	
5. ACTION	
6. EVALUATION	
Project reports, deliverables and recommendations *(relevant to RODRIGUE)*	
Project's future perspectives	

Contributor: LCPC

Project card	*A.19.2 Safespot – SP 3*
General Info	SINTECH subproject is devoted to the sensors. It is intended to finish at T0+36
Key Objectives	Main objective is to analyse innovative technologies involved in SAFESPOT development, to adapt and enhance them in order to properly integrate them into the vehicle and infrastructure platforms
Key Activities	The subproject focuses on three topics: maps, communication and safety margin assistants
Relevance to RODRIGUE	
RODRIGUE Topic	*Output relevant to the RODRIGUE Topic*
1. DIAGNOSIS	The map architecture developed in SafeSpot is a multi layer map that accept both static and dynamic content
2. COMMUNICATION	Communication will be developed in association with CVIS, the final product will have a multi vector support.
3. INFORMATION	
4. RISK	
5. ACTION	
6. EVALUATION	
Project reports, deliverables and recommendations *(relevant to RODRIGUE)*	
Project's future perspectives	

Contributor: LCPC

Project card	***A.19.3 Safespot – SP 4+5***
General Info	SCOVA and COSSIB subprojects of SafeSpot are devoted to the application. They are intended to finish at T0+48
Key Objectives	Development of new application for safety based on V2V and V2I communications and cooperation.
Key Activities	SP4 develops application based on on-board computing, while SP5 is based on roadside development.
Relevance to RODRIGUE	
RODRIGUE Topic	*Output relevant to the RODRIGUE Topic*
1. DIAGNOSIS	
2. COMMUNICATION	
3. INFORMATION	Depending on the subproject, applications can address warning to the driver using on board unit or road side unit
4. RISK	
5. ACTION	Mainly information to the driver that can use on board unit or road side unit
6. EVALUATION	
Project reports, deliverables and recommendations *(relevant to RODRIGUE)*	
Project's future perspectives	

Contributor: LCPC

Project card	***A.20 SEVECOM***
General Info	**Start date:** 2006-01-01 **End date:** 2008-12-31 **Duration:** 36 months **Project Reference:** 027795 **Project cost:** 4,674,048 € **Project Funding:** 2,998,983 € **Programme Acronym:** FP6-IST **Subprogramme Area:** eSafety Co-operative Systems for Road Transport **Contract type:** Specific Targeted Research Project **URL:** http://www.sevecom.org **Consortium**: Trialog (coordinator), Bosch, Budapest University of Technology and Economics, DaimlerChrysler, EPFL, CRF, Katholieke Universiteit Leuven, Ulm University **Contact**: Antonio Kung (Trialog),Tel: +33 144 70 61 03, antonio.kung@trialog.com
Key Objectives	Define a consistent and future-proof solution to the problem of Vehicular communications (VC) and inter-vehicular communications security.
Key Activities	- Identification of the variety of threats: attacker's model and potential vulnerabilities; in particular, study of attacks against the radio channel and transferred data, but also against the vehicle itself through internal attacks, e.g., against TCU (Telematics Control Unit), ECU (Electronic Control Unit) and the internal control bus. - Specification of architecture and of security mechanisms, which provide the right level of protection. It will address issues such as the apparent contradiction between liability and privacy, or the extent to which a vehicle can check the consistency of claims made by other vehicles. The following topics will be fully addressed : Key and identity management, Secure communication protocols (including secure routing), Tamper proof device and decision on crypto-system, Privacy. The following topics will be investigated in preparation of further work: Intrusion Detection, Data consistency, Secure positioning, Secure user interface. - The definition of cryptographic primitives which take into account the specific operational environment. The challenge is to address (1) the variety of threats, (2) the sporadic connectivity created by moving vehicles and the resulting real-time constraints, (3) the low-cost requirements of embedded systems in vehicles. These primitives will be adaptations of existing cryptosystems to the VC environment.
Relevance to RODRIGUE	
RODRIGUE Topic	*Output relevant to the RODRIGUE Topic*
1. DIAGNOSIS	
2. COMMUNICATION	SEVECOM will provide security specifications for vehicular communications
3. INFORMATION	
4. RISK	
5. ACTION	
6. EVALUATION	
Project reports, deliverables and recommendations *(relevant to RODRIGUE)*	
	http://www.sevecom.org/Pages/Publications.html
Project's future perspectives	

Contributor: Erdyn consultants

Project card	***A.21 SpeedAlert***
General Info	"Harmonizing the in-vehicle speed alert concept definition" FP6 DG TREN, 05/2004-04/2005, coordinated by Ertico (be) http://www.speedalert.org/
Key Objectives	The SpeedAlert overall objectives are to harmonise the in-vehicle speed alert concept definition and to investigate the first priority issues to be addressed at the European level, such as the collection, maintenance and certification of speed limit information More precisely this is translated in the following specific objectives: 1. Establish a common classification of speed limits in Europe relevant to speed alert system. 2. Define the system and service requirements of in-vehicle speed alert system. 3. Define functional specification and architecture. 4. Harmonise definition of speed alert concepts. 5. Identify requirement for standardization. A harmonized speed alert concept definition will support the broad market take-up of in-vehicle speed information and warning systems, which in turn will have a significant impact on road safety.
Key Activities	
Relevance to RODRIGUE	
RODRIGUE Topic	*Output relevant to the RODRIGUE Topic*
1. DIAGNOSIS	Common classification of speed limits in Europe relevant to speed alert applications
2. COMMUNICATION	
3. INFORMATION	Harmonised definition of speed alert concepts
4. RISK	
5. ACTION	
6. EVALUATION	
Project reports, deliverables and recommendations *(relevant to RODRIGUE)*	
D1.1 Final report	http://www.webhouse.dk/speedalert/acrobat/SA_V10_DEL_Final%20Report_141005.pdf
Project's future perspectives	
	To support the deployment of more advanced speed alert applications providing incremental map update and variable speed limits, it is important to develop a standardised infrastructure-vehicle communication to support the provision of dynamic content with European-wide harmonised service.

Contributor: LCPC

Project card	*A.22 VERTEC*
General Info	"Vehicle, road, tyre and electronic control systems interaction" FP5, 2002-2005, coordinated by Pirelli (Italy). **Start date:** 2002-12-01 **End date:** 2005-11-30 **Duration:** 36 months **Project Reference:** G3RD-CT-2002-00805 **Project cost:** 5,350,018 € **Project Funding:** 2,995,929 € **Programme Acronym:** GROWTH **Programme type:** Fifth Framework Programme **Subprogramme Area:** Key Action Land Transport and Marine Technologies **Contract type:** Cost-sharing contracts http://www.vertec.hut.fi Project partners: C.E.T.E. de Lyon, CRF, Dr.Ing.h.c.F.Porsche AG, Helsinki University of Technology (HUT), Nokian Tyres Plc, Pirelli Pneumatici S.p.A, Sweden National Road and Transport Institute (VTI), TRL Limited, TRW / Lucas, Universita' Degli Studi di Firenze (UNIFI), Volvo Truck Corporation
Key Objectives	Increase vehicle active safety by means of a fully integrated model for behaviour prediction in potentially dangerous situations.
Key Activities	Develop, validate and integrate a model for the simulation of the road-tyre-vehicle-driver system including the behaviour of the dynamic vehicle control.
Relevance to RODRIGUE	
RODRIGUE Topic	*Output relevant to the RODRIGUE Topic*
1. DIAGNOSIS	
2. COMMUNICATION	
3. INFORMATION	
4. RISK	- Definition of the parameters that have to be shared between vehicle-tyre and infrastructure in order to run a full integrated model for the identification of potentially dangerous situations. - Identification of possible dangerous situations and definition of a new tool for the investigation of safety speed to provide to the road users.
5. ACTION	Definition of possible application of handling simulation models that can be applied to road vehicle and infrastructure design for improving road safety.
6. EVALUATION	New handling tool for the investigation of the road characteristics (geometric layout, skid resistance), of the weather (rainfall, snow/ice) and of the possible manoeuvre (trajectories) parameters influence on the vehicle behaviour.
Project reports, deliverables and recommendations *(relevant to RODRIGUE)*	
Final report	https://wwwauto.hut.fi/vertec/
Deliverables	https://wwwauto.hut.fi/vertec/
Project's future perspectives	
	No follow up of the Project. Some partners have identified possible advances in order to arrange a new model to be used for other simulation and optimization.
	Integration of the developed handling simulation tool with intelligent transportation systems development.

Contributor: UniFi

Project card	***A.23 WATCH-OVER***
General Info	"Cooperative vulnerable road users" FP6, 01/2006-12/2008, coordinated by CRF (Italy) http://www.watchover-eu.org/
Key Objectives	Examine the detection of vulnerable road users in the complexity of traffic scenarios in which pedestrians, cyclists and motorcyclists are walking or moving together with cars and other vehicles.
Key Activities	- Identification of user requirements and relevant use cases. - Specification of system architecture, functions and applications. - Selection and adaptation of the most promising short-range communication technologies. - Design and development of new generation automotive CMOS cameras. - Implementation of software algorithms for real time detection of vulnerable road users. - Design and development of the system customised for different users. - Results dissemination and deployment
Relevance to RODRIGUE	
RODRIGUE Topic	*Output relevant to the RODRIGUE Topic*
1. DIAGNOSIS	
2. COMMUNICATION	
3. INFORMATION	
4. RISK	Examine the detection of vulnerable road users in the complexity of traffic scenarios in which pedestrians, cyclists and motorcyclists are walking or moving together with cars and other vehicles.
5. ACTION	
6. EVALUATION	
Project reports, deliverables and recommendations *(relevant to RODRIGUE)*	
Project's future perspectives	

Contributor: LCPC

Project card	***B.1 Cooperative Systems***
General Info	Austria; coordinator: ARSENAL
Key Objectives	Dynamic recognition of road conditions and dangerous situations with gathered CAN Bus data using cooperative systems
Key Activities	- Gathering of CAN Bus parameters of the vehicle dynamics on roads in Austria, using specific test scenarios - Identification of correlations with road condition measurements (RoadSTAR) - Recalculation of actual road condition data, e.g. unevenness, on the basis of CAN data - A communication of single vehicle to a collective can inform about actual risk areas and it should be able classify events and situations during driving (real time modelling)
Relevance to RODRIGUE	
RODRIGUE Topic	*Output relevant to the RODRIGUE Topic*
1. DIAGNOSIS	Real time check of the road conditions or possible dangerous spots using in-vehicle data, driving dynamics (CAN)
2. COMMUNICATION	Interaction between vehicles and infrastructure
3. INFORMATION	
4. RISK	Real time warning, risk assessments
5. ACTION	
6. EVALUATION	
Project reports, deliverables and recommendations *(relevant to RODRIGUE)*	
Project's future perspectives	

Project card	***B.2 Highway 3***
General Info	Austria; coordinator: MAGNA; partner: ARSENAL
Key Objectives	Increase of road safety and the improvement of the traffic flow on a motorway section introduced by a test installation of a cooperative system
Key Activities	• Collection, processing as well as transferring of information about environmental conditions, roadway condition and density of traffic • Weather situation (dampness, wind, temperature,…), roadway (friction value,….) and traffic conditions are measured on the basis of sensors and camera systems (radar/video/infrared, …) • Further data from the vehicle (ESP, ABS, different controllers, air conditioning system,…) are conveyed • The data upon topography of the motorway section, determined by precise measurement (RoadSTAR) are combined with current data from the environment and vehicle to a data pool • The data pool can be further processed by a service provider and summarized for a distinct section of the motorway. From these data a speed adjustment for a distinct motorway section be recommended
Relevance to RODRIGUE	
RODRIGUE Topic	*Output relevant to the RODRIGUE Topic*
1. DIAGNOSIS	multiple sensors; static data; dynamic data
2. COMMUNICATION	equipped test site; demonstrator tests; communication hardware ready
3. INFORMATION	
4. RISK	risk assessment included to calculate appropriate speed developing algorithm for safe traffic flow under changing conditions
5. ACTION	HMI test; C2I; I2C; warnings
6. EVALUATION	
Project reports, deliverables and recommendations *(relevant to RODRIGUE)*	
Project's future perspectives	

Project card	***B.3 MARVIN***
General Info	Austria; coordinator: ARSENAL **http://www.arsenal.ac.at/downloads/PB/MARVin_engl.pdf**
Key Objectives	• Assess the coherence between road infrastructure and road accidents
Key Activities	• Link the road conditions data with accident data based on the locality of the accident • Develop suitable mathematical models for the verification of accident causalities • Implement accident-cause-research within Road Safety Inspections and Audits • Specific measures to create awareness in combination with driving education, based on detailed accident statistics and conclusions of accident analyses of motorcycles • Identify connections between data on road accidents and traffic infrastructure and develop specific preventive measures
Relevance to RODRIGUE	
RODRIGUE Topic	*Project output relevant to the RODRIGUE Topic*
1. DIAGNOSIS	• Explain so far unexplored accident causalities • Demonstrate the connection of different parameters for accident sources using mathematical models • Clarify accident events on similar route sections • Accident analysis and crash-causes-research specifically regarding powered two-wheelers • Innovative accident prognoses and derived preventive measures
2. COMMUNICATION	
3. INFORMATION	
4. RISK	• Compare different EU countries; link road conditions data with accident data based on the locality of the accident and compare the results (if such data is available in other countries). • Assess infrastructure risk level • Accident analysis specifically regarding to powered two-wheelers (PTW)
5. ACTION	• Identify crash-causal combinations and develop preventive measures (new tools for Road Safety Inspections and Road Safety Audits)
6. EVALUATION	
Project reports, deliverables and recommendations *(relevant to RODRIGUE)*	
Project's future perspectives	

Project card	***B.4 ARCOS***
General Info	France; Coordinator: LIVIC (LCPC/INRETS) http://www.arcos2004.com/
Key Objectives	Enhance driving safety on the basis of four safety functions (inter-vehicle distances, collisions, lane departure, accident warning), with 3 action levels (warning, cooperative action, automatic action).
Key Activities	- sensing the environment ahead of the vehicle; - data processing and transmission; - accidentology, HMI, acceptability, socio-economic evaluation; - demonstrators. - plan further development and technology deployment
Relevance to RODRIGUE	
RODRIGUE Topic	*Output relevant to the RODRIGUE Topic*
1. DIAGNOSIS	
2. COMMUNICATION	Communication is taken into account in the four functions safety, but not the technological development itself. The project has planned technological deployment of functions from autonomous vehicle to large scale communication in three step (fully autonomous vehicle, communication with road side and in a last step fully communicating)
3. INFORMATION	Information is provided to the user using on board unit. The HMI has been given a particular attention.
4. RISK	Risk functions concept has been developed in the project, with other concept of shared referential (between driver and automatic devices for risk assessment). At the communication level, priority level have been given to each message, the on board unit make a relevance checking based on trajectory and priority.
5. ACTION	Action on the vehicle should impact both longitudinal and lateral mode. They are classified under four categories, becoming more and more intrusive in the driving task up to the automation of a task
6. EVALUATION	A large effort has been put on evaluation of the system: evaluation of sensors, evaluation of control law and evaluation of HMI
***Project reports, deliverables and recommendations** (relevant to RODRIGUE)*	
	Risk functions etc.
Project's future perspectives	

Project card	**B.5 DIVAS**
General Info	France; Coordinator: LCPC Project Manager: Philippe Lepert email: mailto:Lepert@lcpc.fr
Key Objectives	- to build a global concept of vehicles - infrastructure information exchange system, efficient in terms of road safety - to prepare its implementation, taking into account all the consequences of this implementation, especially in terms of technology, credibility and acceptability.
Key Activities	- Accidentology and road characteristics. - Assess and combine risk factors (trajectory, skid resistance, visibility). - Global architecture and test. - Credibility and liability of a cooperative system.
Relevance to RODRIGUE	
RODRIGUE Topic	*Output relevant to the RODRIGUE Topic*
1. DIAGNOSIS	Actual speeds will be measured along road itineraries using instrumented vehicles, and compared with legal speed limits from speed signs and with required speeds based on road geometry, in order to make the link between road characteristics and speed behaviour.
2. COMMUNICATION	The project aims at determining the respective parts played by the vehicles and the infrastructure in the cooperative system: this will determine the global architecture, as well as the communication means.
3. INFORMATION	The project will provide customized speed recommendations inside the vehicle.
4. RISK	The project will define risk assessment methods for different risk factors and provide a combination method in order to output an aggregated risk level. Risk assessment makes strong use of the trajectory concept.
5. ACTION	
6. EVALUATION	The impact of the cooperative system will be investigated by studying the trajectories with or without the system using instrumented vehicles.
***Project reports, deliverables and recommendations** (relevant to RODRIGUE)*	
The project has just started, but it is very close to RODRIGUE topics, and as a consequence, all results will be potentially relevant.	
Project's future perspectives	
The project has just started. A collaborative action is already under way to share experience with Californian VII (Vehicle-Infrastructure Integration) projects.	

Project card	***B.6 LAVIA***
General Info	Jacques Ehrlich – Project Manager – LIVIC – email:Ehrlich@lcpc.fr
Key Objectives	Assessment of the LAVIA (French ISA) system
Key Activities	- Survey on driver's attitudes and opinions regarding speed and speed limiter - Driver recruitment - System specifications - Prototypes (2 vehicles), fleet (20 vehicles) and data recorders construction, - Pre evaluation involving 12 drivers to assess usage and usability of the system: video records analysis, verbal reactions analysis. - Evaluation involving 92 drivers to assess utility and safety impact: statistical analysis, surveys analysis.
Relevance to RODRIGUE	
RODRIGUE Topic	*Output relevant to the RODRIGUE Topic*
1. DIAGNOSIS	
2. COMMUNICATION	Legal Speed limits were collected by a map manufacturer and recorded into an on-board database.
3. INFORMATION	Information was provided to the driver by displaying the current speed limit on the dashboard. Indication was blinking if the speed limit was exceeded.
4. RISK	
5. ACTION	In the two active modes (voluntary or mandatory), the throttle was under LAVIA control, such as speed limit cannot be exceeded. Brakes were not concerned by LAVIA.
6. EVALUATION	Behaviour concerns: usage, usability, utility, and safety impact. The main objective consisted in measuring speed reduction due to LAVIA and to link it with fatalities and serious accident reduction. Original methods based on speed distribution other the time or the distance and relationship between speed and severity, were developed.
Project reports, deliverables and recommendations *(relevant to RODRIGUE)*	
Report on statistical Analysis	
LAVIA summary report (English translation of the " Carnet de Route du LAVIA)	
LAVIA website : www.lavia.fr	
Project's future perspectives	
BALI : feasibility study of the construction and updating of a speed database at the scale of a French County (Yvelines).	
COSAL : Cooperative Speed Alert : how to provide to the driver, in real time, static, dynamic and temporary speed limits using innovative telecommunication technologies	
VOLTAIRE : Field Operational Test to deploy speed alert system.	

Project card	***B.7 Prevensor***
General Info	France; Coordinator: IRCCyN - PsyCoTec http://www.prevensor.fr/ Project end in December 2007
Key Objectives	Find a common reference between driver and machine assessment of risk, based on perception measurement, in the task of lane keeping.
Key Activities	- Assessment of perception based measure of risk; - Development of on board measurements; - Evaluation of driver and machine risk reference; - demonstrators.
Relevance to RODRIGUE	
RODRIGUE Topic	*Output relevant to the RODRIGUE Topic*
1. DIAGNOSIS	
2. COMMUNICATION	
3. INFORMATION	
4. RISK	Risk evaluation is based on perception of the road based on two kinds of criteria: - time to lane crossing - variation of tangent point on the lane. The evaluation of risk may then directly be given to the driver of be the trigger of a corrective action.
5. ACTION	Action shall range from informative to corrective, but in the frame of the project, only informative action is evaluated.
6. EVALUATION	System is evaluated at three stages: - choice of indicators on driving simulator - development of measurement on vehicle - validation of common frame on vehicle
Project reports, deliverables and recommendations *(relevant to RODRIGUE)*	
Project's future perspectives	

Project card	***B.8 SARI***
General Info	France (PREDIT); Coordinator: LCPC; 2005-2009) http://www.sari.prd.fr/index.html
Key Objectives	The SARI project aims to bring about a significant reduction in the number of loss-of-control accidents, by providing drivers with better information about the driving difficulties they will have to confront. The objective is to relate a level of risk of loss of control to the characteristics of the road in order to identify information to help drivers move from the situation of normal attention to one of increased attention and lead them to modify their behaviour. SARI addresses secondary roads, where driver behaviour is principally influenced by the road itself rather than by other drivers.
Key Activities	SARI addresses 3 different sources of loss of control: - physical discontinuities in the route (RADARR); - deteriorations caused by rain and wind (IRCAD); - discontinuities in visibility and legibility of the road (VIZIR). The effectiveness of the information and guidance systems is evaluated by on-road trials in three French Départements (AJISE)
Relevance to RODRIGUE	
RODRIGUE Topic	*Output relevant to the RODRIGUE Topic*
1. DIAGNOSIS	New tools (new measurement means, and trajectory observatories) for diagnosing the road locations with the highest risk as regards loss of control.
2. COMMUNICATION	New communication between: measurement sensors and road sign
3. INFORMATION	Tools for providing information and warnings about zones identified as risky: new signs and warnings on the roadside.
4. RISK	Assessment methods for risk of loss of control and visibility.
5. ACTION	
6. EVALUATION	News tools for understanding drivers' behaviours (trajectory observatories); evaluations with regard to the acceptability of the proposed systems by the drivers, and to their possible deployment by road managers.
Project reports, deliverables and recommendations *(relevant to RODRIGUE)*	
In the SARI research project, the infrastructure is placed at the centre of the driver-vehicle-infrastructure system. The tools and equipment that are developed and evaluated will make it possible to measure how much the road contributes to a risk of loss of control. The diagnosis methods which are implemented and the automatic observations of vehicles in specific zones (bends, intersections, summits) will make it possible to propose new signs and evaluate their effect on drivers.	
As the trialled solutions are intended for rural roads, which are characteristic of the county network, partnership with the Département General Councils has naturally been given priority, and it is today both effective and efficient. While the current idea is for the driver information to be presented by the infrastructure using "low cost" devices, the possibility of displaying it inside vehicles is being studied.	
Project's future perspectives	
The SARI project got under way in early 2005 and is an important stage for our understanding of the influence of roads on driver behaviour. Conducting and analyzing observations of vehicle trajectories at experimental sites will permit researchers in human and social sciences to evaluate better the way drivers take account of the information they receive. Obviously, the nature and content of the message that is delivered will also be evaluated. The comparison between the results obtained from the SARI project and what is already known and what will be learnt from the SAFEMAP project in which in-vehicle information is provided should be interesting and innovative. New prospects for road signing should be opened up.	

Project card	***B.9 SafeMap***
General Info	DeuFraKo project; Coordinator:
Key Objectives	SafeMap aims to assess socio economic feasibility of a dedicated digital map for road safety
Key Activities	- from raw data to map process - Safety functions based on digital map - Digital map accuracy requirement - demonstrators.
Relevance to RODRIGUE	
RODRIGUE Topic	*Output relevant to the RODRIGUE Topic*
1. DIAGNOSIS	The project has gathered the specifications of vehicle able to analyse road geometry and surface. These specifications have been compared with the accuracy required to achieve various safety functions (from accident black spot to curve warning). Moreover, SafeMap has also handled specific data such as legal speed limit. Data collection cost has been evaluated.
2. COMMUNICATION	
3. INFORMATION	
4. RISK	Assistances have been developed and warn driver on specific infrastructure risk, as curve warning, accident black spot, and specific functions for heavy vehicle. Warning system have positive effect on speed control and is judged quite positively by users (acceptability).
5. ACTION	
6. EVALUATION	
Project reports, deliverables and recommendations *(relevant to RODRIGUE)*	
Project's future perspectives	

Project card	***9.3.1.1.1 B.10.1 INVENT / FUE.***
General Info	Detection and Interpretation of the Driving Environment Germany; contact : Walter E. Scholl, INVENT Office, Huelenbergstrasse 10, D 73230 Kirchheim unter Teck 06/2001 – 099/2005 **partners**: Robert Bosch GmbH, DaimlerChrysler AG, Hella KG Hueck & Co., MAN Nutzfahrzeuge AG, Adam Opel AG, Siemens VDO Automotive AG, Volkswagen AG
Key Objectives	Develop solutions and algorithms for improved detection and interpretation of the driving environment
Key Activities	The initial project period is concentrated on common specification of sensors and reference scenarios for INVENT applications. The focus of this component project is on development of algorithms for perception and reconstruction of the driving environment. Selection of an appropriate system architecture and validation will be closely matched to applications. Documentation and management activities will support the component project for its entire duration.
Relevance to RODRIGUE	
RODRIGUE Topic	*Project output relevant to the RODRIGUE Topic*
1. DIAGNOSIS	
2. COMMUNICATION	
3. INFORMATION	
4. RISK	In contrast to the current fragmented approach using many individual sensors with independent controllers, future systems will be integrated by common access to all available sensor information into networks capable of creating a comprehensive, consistent environmental model that will be accessible to all applications. Together with the applications themselves, which inform or warn the driver or even intervene in case of severe hazards, this environmental model will allow the creation of what amounts to a protective electronic shield surrounding the vehicle. Hence, this vision of measurement and interpretation of the driving environment represents a key step on the way from passive to active safety.
5. ACTION	
6. EVALUATION	The complex tasks of future assistance systems require thorough validation using reference scenarios. It is also possible to incorporate synthetic test scenarios into the validation strategy, particularly for assessment of component functions. The interplay of all components will be tested within Detection and Interpretation of the Driving Environment for realistic scenarios using test vehicles. For these tests, it is planned to record the complete time sequence of all sensor data. An important aspect in assessment of Detection and Interpretation of the Driving Environment is real-time visualization of the environmental model. This will provide the developers with an immediate qualitative picture of the information provided by the implemented sensors and algorithms both in the laboratory and in road tests.
Project reports, deliverables and recommendations *(relevant to RODRIGUE)*	
	http://www.invent-online.de/downloads/FUE_handout-E.pdf
Project's future perspectives	

Project card	*B.10.2 INVENT / FVM.*
General Info	Driver Behaviour and Human-Machine Interaction Germany; contact : Walter E. Scholl, INVENT Office, Huelenbergstrasse 10, D 73230 Kirchheim unter Teck 06/2001 – 09/2005 partners: BMW Group, DaimlerChrysler AG, Robert Bosch GmbH, Volkswagen AG
Key Objectives	Development of methodological fundamentals concerning the central topics of driver behaviour, system familiarization, and traffic safety. This project is designed to guarantee the "user-friendliness" of the technological solution approaches of both other project of INVENT : STA and VAS
Key Activities	The component project Driver Behaviour and Human-Machine Interaction is intended to address three main issues: - How should the driving behaviour of intervening assistance systems be designed to achieve the best possible interaction between the driver and the system? - How should the human-machine interfaces be designed to guarantee intuitive understanding and easy familiarization with the system? - What is the impact of the interaction with driver assistance and information systems on traffic safety? These will be translated to design guidelines and solution approaches for human-machine interfaces, and the results will be validated using prototypes from the component projects Congestion Assistant STA and Driver Assistance Active Safety VAS.
Relevance to RODRIGUE	
RODRIGUE Topic	*Project output relevant to the RODRIGUE Topic*
1. DIAGNOSIS	
2. COMMUNICATION	
3. INFORMATION	Results : • Methods and procedures - Construct searchable database for driver behaviour literature relevant to assistance systems - Derive operational model of learning behaviour and performance - Derive method for assessment of learning progress and system comprehension - Develop evaluation procedure for traffic safety of driving assistance and information systems - Develop procedure for long-term assessment of assistance systems tested using a system prototype • Prototypes - Provide evaluated prototypes for the learning and comprehension improvement strategies developed within the project focus "Self-explanatory driver assistance systems" (e.g., situation and learning adaptive information system for ACC) • Direct input to the application projects - Provide driver behaviour data for specification and design of the assistance system applications -Identify and compile guidelines and norms relevant to the HMI - Provide guidelines for design of self-explanatory, comprehensible, and safe assistance systems - Support implementation of guidelines for application design
4. RISK	

5. ACTION	
6. EVALUATION	
Project reports, deliverables and recommendations *(relevant to RODRIGUE)*	
	www.invent-online.de/downloads/FVM-handout-E.pdf
Project's future perspectives	

Project card	***B.10.3 INVENT / STA.***
General Info	Congestion assistant Germany; contact : Walter E. Scholl, INVENT Office, Huelenbergstrasse 10, D 73230 Kirchheim unter Teck 06/2001 – 099/2005 **partners**: Audi AG, Robert Bosch GmbH, MAN Nutzfahrzeuge AG, Adam Opel AG, Siemens VDO Automotive AG
Key Objectives	By supporting drivers during stop-and-go traffic, the Congestion Assistant forms a key component to maintain mobility by smoothing the flow of traffic, reducing environmental impacts, and improving safety. The purpose of this component project is to develop a future marketable congestion assistance system on the basis of known ACC f(Adaptive Cruise Control) functions. The extension of ACC systems planned for the development of the congestion assistant will concentrate on driving in jammed traffic (at low or zero speed and high vehicle density). The assistance system will be designed to provide the driver both longitudinal and lateral guidance.
Key Activities	By the first milestone after two years, the results of the market and situation analyses as well as a framework for the functionality of congestion assistant based on these analyses will be available. The requirements on vehicle environment sensors and an initial version of the driver-system interface will be completed by that time. During the second phase of the project, the vehicle control system will be completed on the basis of this milestone, transferred to the prototypes, and evaluated. The second milestone at the end of the project will include a presentation of the development results and a demonstration of the test vehicles.
Relevance to RODRIGUE	
RODRIGUE Topic	*Project output relevant to the RODRIGUE Topic*
1. DIAGNOSIS	
2. COMMUNICATION	Using appropriate simulation techniques, the component project will also investigate whether and to what degree traffic flow can be further improved using inter-vehicle communication
3. INFORMATION	
4. RISK	
5. ACTION	The assistance system will be designed to provide the driver both longitudinal and lateral guidance.
6. EVALUATION	
Project reports, deliverables and recommendations *(relevant to RODRIGUE)*	
	www.invent-online.de/downloads/STA-handout-E.pdf
	Compared to urban traffic, the range of situations in congested traffic that this system will need to master is quite restricted. Due to the low speed level, wide-angle sensors for driving environment measurements up to a range of 50 meters will suffice. Both, the improvements in short-range measurements as well as progress on sensor fusion necessary for this project could provide a boost to the investigation of sensor systems for long-range measurements and improved resolution, so that in the future a gradual transition to more advanced systems for the long range is conceivable as a consequence of this research.
Project's future perspectives	

<table>
<tr><th>Project card</th><th>B.10.4 INVENT / VRA.</th></tr>
<tr><td>General Info</td><td>Traffic Impact, Legal Issues and Acceptance
Germany; contact : Walter E. Scholl, INVENT Office, Huelenbergstrasse 10,
D 73230 Kirchheim unter Teck
06/2001 – 09/2005
partners: BMW Group, DaimlerChrysler AG, Forschungsgesellschaft, Kraftfahrwesen mbH Aachen (fka), PTV Planung Transport und Verkehr AG, TÜV Kraftfahrt GmbH, Universität zu Köln, Vogt & Kollegen, Volkswagen AG</td></tr>
<tr><td>Key Objectives</td><td>Development of evaluation procedures and methods designed to accommodate the specific needs and requirements of the both projects STA and VAS</td></tr>
<tr><td>Key Activities</td><td>The project Traffic Impact, Legal Issues, and Acceptance is sub-divided into
several tasks:
• Traffic impacts : the impacts of new assistance systems on traffic will be analyzed using traffic simulation. This will allow parallel testing of implementation alternatives and provide a general assessment of comfort and safety improvements.
• Innovation, acceptance, and the consumer
• Present and anticipated customer needs will be analyzed and customer acceptance forecasts will be developed. Implications for safe and secure use will be investigated as soon as first system prototypes are available.
• Legal aspects : This task will investigate legal conditions, regarding product liability, Type Approval and liability issues of the systems developed in INVENT.
• Economic assessment : the goal of this task is to provide system developers and the public with an assessment of the potential benefits as well as the costs connected with these systems at an early stage.</td></tr>
<tr><td colspan="2">Relevance to RODRIGUE</td></tr>
<tr><td>RODRIGUE Topic</td><td>Project output relevant to the RODRIGUE Topic</td></tr>
<tr><td>1. DIAGNOSIS</td><td></td></tr>
<tr><td>2. COMMUNICATION</td><td></td></tr>
<tr><td>3. INFORMATION</td><td></td></tr>
<tr><td>4. RISK</td><td></td></tr>
<tr><td>5. ACTION</td><td></td></tr>
<tr><td>6. EVALUATION</td><td>VRA will accompany the application projects Congestion Assistance and Anticipatory
Active Safety in the development of novel assistance systems by means of a series of targeted evaluation procedures:
– Traffic simulation for analysis of traffic impacts
– Customer surveys and workshops
– Driving experiments on test tracks and tests in real traffic
– Analysis of legal conditions
– Cost-benefit analyses</td></tr>
<tr><td colspan="2">Project reports, deliverables and recommendations (relevant to RODRIGUE)</td></tr>
<tr><td></td><td>www.invent-online.de/downloads/VRA_handout-E.pdf</td></tr>
<tr><td></td><td></td></tr>
<tr><td colspan="2">Project’s future perspectives</td></tr>
<tr><td></td><td>VRA deals not only with assessment of driver assistance systems created in the INVENT application projects: of equal importance is the parallel development and extension of the evaluation methodology. In order to allow quick and efficient assessment, a comprehensive interconnected software environment is planned to coordinate evaluation of all four application areas with clearly defined interfaces between them. In this way, Traffic Impact, Legal Issues, and Acceptance will help to pave the way to success of future driver assistance systems.</td></tr>
</table>

Project card	*B.10.5 INVENT / VAS*
General Info	Anticipatory Active Safety Germany; contact : Walter E. Scholl, INVENT Office, Huelenbergstrasse 10, D 73230 Kirchheim unter Teck 06/2001 – 09/2005 partners : Audi AG, BMW Group, Robert Bosch GmbH, DaimlerChrysler AG, MAN Nutzfahrzeuge AG, Siemens Restraint Systems AG, Siemens VDO Automotive AG, Volkswagen AG
Key Objectives	The component project Anticipatory Active Safety aims to reduce the severity and the number of traffic accidents -particularly those leading to serious injuries and fatalities.
Key Activities	Anticipatory driver assistance systems can be particularly effective in city traffic and on country roads in avoiding accidents and protecting the most vulnerable road user. The INVENT component project Anticipatory Active Safety will design and develop solution approaches based on detailed cause analysis of the sequence of events before and during an accident. For the most promising approaches, this component project identifies and describes the information and sensor requirements and investigates appropriate driver-system interfaces. The solutions that are identified will be implemented within the course of the project in driving simulators and in test vehicles equipped with prototypes. The assistance functions of Anticipatory Active Safety will be evaluated with respect to feasibility and prospective safety benefits. To this end, the demonstrators will be used to carry out extensive tests in driving simulators, on test tracks, and in real traffic.
Relevance to RODRIGUE	
RODRIGUE Topic	*Project output relevant to the RODRIGUE Topic*
1. DIAGNOSIS	
2. COMMUNICATION	
3. INFORMATION	
4. RISK	
5. ACTION	Safety assistance systems are being developed that are designed to support the driver during safety-critical driving manoeuvres and thus prevent accidents. Another important goal is to develop special solutions for effective protection of pedestrians and cyclists. The specification of these systems and their implementation as prototypes will be based on detailed causal analysis of the sequence of events taking place before and during an accident. The focus of this component project is on four safety functions: • Lateral control assistance • Intersection assistance • Protection of pedestrians and cyclists • Predictive control of vehicle dynamics
6. EVALUATION	
Project reports, deliverables and recommendations *(relevant to RODRIGUE)*	
	http://www.invent-online.de/downloads/VAS_handout-E.pdf
	At the first milestone after two years, the results of the accident analysis will be available. In addition, several options for system functions will be implemented in demonstrators and driving simulators. Based on this milestone, system functionality will be extended and implemented in prototypes during the second phase of the project. The second milestone at the end of the project demonstrates the full range of system functions in test vehicles.

Project's future perspectives	

Project card	***B.11 Central Transport Database***
General Info	Poland, coordinator: IBDiM (Road and Bridge Research Institute); http://www.ibdim.edu.pl
Key Objectives	Collect and analyze data on road and railway transport in Poland
Key Activities	Central Transport Database includes information on: - Pavement conditions on national roads network - Traffic flows - Traffic accidents - Weather reports - Railway infrastructure
Relevance to RODRIGUE	
RODRIGUE Topic	*Output relevant to the RODRIGUE Topic*
1. DIAGNOSIS	Describe road infrastructure characteristics including : - Crack index - Surface state index - Skid resistance - Road profiles - Ruts Traffic flows and structure Explain reasons of traffic accidents
2. COMMUNICATION	
3. INFORMATION	
4. RISK	
5. ACTION	
6. EVALUATION	
Project reports, deliverables and recommendations *(relevant to RODRIGUE)*	
Project's future perspectives	
CTD will include information on costs of modernized road sections for an assessment of effectiveness of different safety measures	

Project card	***B.12 Infrastructure and road safety***
General Info	The Netherlands, Coordinator: SWOV Institute for Road Safety Research 2003-2006 Continuation of SWOV: R-2002-19 project "The analysis of crash, road, and traffic features of the Netherlands state roads"
Key Objectives	This project is aimed at finding the relations between, on the one hand, the features of the infrastructure and traffic on the Netherlands road network and, on the other hand, the road safety. This project takes into account the spatial dependence between road sections (changing routes). The goal is to identify the (non-linear) relation for roads, between the exposure (volume) and crash rate on the one hand, and the crash (and casualties) densities on the other hand; both subdivided by road features.
Key Activities	This project begins with a literature study and the formulation of specific hypotheses about relations between the infrastructure's features and exposure/traffic volumes on the one hand, and road safety on the other hand. Next, test areas are selected and the necessary data is gathered to test these hypotheses then analysed, after which the results will be published.
Relevance to RODRIGUE	
RODRIGUE Topic	*Output relevant to the RODRIGUE Topic*
1. DIAGNOSIS	It is important that road authorities and policy-makers know what the relation is between road and traffic features and road safety. This project contributes to that knowledge. In this way, research results can provide direction to the discussions about bypasses of the main road network. Relieving the main roads by parallel roads for destination traffic could be safer than extending the main roads with even more lanes. This means improving the safety of lower order roads is necessary.
2. COMMUNICATION	
3. INFORMATION	
4. RISK	
5. ACTION	
6. EVALUATION	
Project reports, deliverables and recommendations *(relevant to RODRIGUE)*	
Project's future perspectives	

Project card	***B.13 Measures for speed control***
General Info	The Netherlands, Coordinator: SWOV Institute for Road Safety Research, contact: Ingrid van Schagen 2003-2006
Key Objectives	The project contributes to a deeper understanding of the (cost)-effectiveness of various measures and combinations of measures to achieve desired, safe traffic behaviour.
Key Activities	This project aims to find the answer to, among others, the following questions: • what do the optimal surveillance and enforcement activities look like? • what are the possibilities and effects of intelligent, flexible speed limits? • what are the possibilities of in-vehicle technologies (e.g. ISA, ACC)?
Relevance to RODRIGUE	
RODRIGUE Topic	*Output relevant to the RODRIGUE Topic*
1. DIAGNOSIS	
2. COMMUNICATION	
3. INFORMATION	
4. RISK	
5. ACTION	The results of this project lead to policy recommendations with regard to (cost)-effective and feasible speed control measures in the short, middle, and long-term.
6. EVALUATION	
Project reports, deliverables and recommendations *(relevant to RODRIGUE)*	
• Three activities have been carried out in 2003 : - the first one is a linking and analysis of data on speed behaviour, surveillance activities, and crashes; this within the framework of the evaluation of the regional enforcement projects. This gives an indication of the most (cost)-effective way (or mixture of ways) of speed surveillance. - then, a meta-analysis of the results of national and international studies of the effectiveness of speed surveillance will be carried out. - finally, the political support for ISA will be described by means of an interview and questionnaire study. • During the course of 2004, the plans for a follow-up study will be made concrete by using the results of the first two activities and the first results of the 'Analysis of speed, speed distribution, and safety' study. They are considering empirical studies of the use of intelligent, flexible speed limits that take the weather and traffic conditions into account, and the effects of more-or-less obligatory in-vehicle technologies. Examples of empirical studies are: driving simulators, observations, and quasi-experimental studies. • In 2005 and 2006, these plans have been carried out.	
Project's future perspectives	

Project card	***B.14 BAMADAS***
General Info	Behavioural Analysis and Modelling for the Design and Implementation of Advanced Driver Assistance. The Netherlands The research program continues scientific research that has been performed within TRAIL in the period 1995-2001. BAMADAS is directed by Prof.dr.ir. R.E.C.M. van der Heijden (University of Nijmegen) and coordinated by Dr.ir. V.A.W.J. Marchau (Delft University of Technology). Contact : Dr Vincent Marcheau, Delft University of Technology Partners : Delft University of Technology, University of Groningen, University of Nijmegen, University of Leiden and SWOV Institute for Road Safety Research. Trail Research School, Connekt and NWO are funding partners Leading institution : Dutch National Science Foundation (NWO), Center for Transport (CONNEKT) and the Research School of Transport, Infrastructure and Logistics (TRAIL) - Public institution Budget is EUR 1.4 million. NWO-Connekt contribution: EUR 550 000 2002-2006
Key Objectives	- Improve the theoretical, and empirical and design knowledge regarding road vehicle driver behaviour in interaction with advanced driver assistance systems. - Transfer this knowledge to deployment strategies for these systems focusing on infrastructure design and traffic management. - Improve the knowledge regarding system certification and liability regulation in a multi-actor environment.
Key Activities	Six interrelated subprojects have been started: • ASTIM: Advanced Safety Criteria Specification by Traffic Interactions Modelling • TOMAS: Testing Operational Models and Behavioural ASsumptions Included in Driving • MOTAS: Modelling ROad Traffic Patterns Using Advanced Driver Assistance Systems • MIDAS: Matching Infrastructure Design with Advanced Driver Assistance Systems • RULES: Regulating the Use of ADAS: Liability and Legislation Aspects of Electronic Driver Support • SPACE: SPAtial development and Concepts of Electronic transportation systems These challenges refer to a scientific mix of innovations in theory-building, methodology development and empirical research. The way of thinking is: • improved knowledge on micro-behaviour results in a better view on the terms of reference for design and deployment of ADAS (what and how). • Next, it structures our view on performance standards and testing programmes for micro-behaviour, including liability regulation among stakeholders (users, automotive industries and road managers) for cases of failure. • Finally, systems that have been designed and implemented, have impacts on traffic flows, infrastructure design and spatial configurations of activities. To study these impacts, traffic flow models are adapted and infrastructure (re)design programs are evaluated. Moreover, the impacts on spatial activities are studied.
Relevance to RODRIGUE	
RODRIGUE Topic	*Output relevant to the RODRIGUE Topic*
1. DIAGNOSIS	
2. COMMUNICATION	
3. INFORMATION	

4. RISK	
5. ACTION	
6. EVALUATION	
Project reports, deliverables and recommendations *(relevant to RODRIGUE)*	
• see http://www.bamadas.tbm.tudelft.nl/	
Project's future perspectives	

Project card	***B.15 VMS policy development: Graphical congestion display***
General Info	UK Partners: Atkins Transport Systems, the Transportation Research Group at the University of Southampton project value: £150,000 ; reference : YY86614 08/2002 – 11/2003
Key Objectives	To identify scope for using VMS to display Journey Time Information to provide improved road user service and contribute towards congestion relief.
Key Activities	The study included four key elements: • Identification of suitable locations for the graphical display of congestion; • Research to identify the best way to present graphical congestion information on a sign; • Identification of the most appropriate hardware to use for display; and • Business case for graphical congestion displays based on Highways Agency Appraisal procedures.
Relevance to RODRIGUE	
RODRIGUE Topic	*Output relevant to the RODRIGUE Topic*
1. DIAGNOSIS	
2. COMMUNICATION	
3. INFORMATION	The study aimed to identify a pilot solution for the Strategic Network around Birmingham and also consider scope for similar on other parts of HA's network. A particular feature of the solution is the development of a map based Graphical Information Panel and to identify areas for European Harmonisation on this topic as well as a business case
4. RISK	
5. ACTION	
6. EVALUATION	
Project reports, deliverables and recommendations *(relevant to RODRIGUE)*	
Graphical Congestion Display Final report (857Kb) Graphical Congestion Display Panels (133Kb)	
Inconclusive Evidence The results have a level of uncertainty such that they are unlikely to be relevant to the formulation of policy.	
Project's future perspectives	

Project card	***B.16 Innovative Traffic Management technique/product assessment***
General Info	UK Contractor: TRL project value: £72,000 ; reference : Y102827 04/2003 – 03/2006
Key Objectives	To assist with the testing and trailing of new and innovative techniques, procedures and equipment in temporary traffic management operations
Key Activities	TRL are providing administrative and technical support to the Safer Temporary Traffic Management Operations Initiative (STTMOI) Trails Team, assisting with the examination and testing of innovative / new techniques, procedures and equipment with the potential to improve safety in temporary traffic management operations.
Relevance to RODRIGUE	
RODRIGUE Topic	*Output relevant to the RODRIGUE Topic*
1. DIAGNOSIS	
2. COMMUNICATION	
3. INFORMATION	
4. RISK	
5. ACTION	
6. EVALUATION	
Project reports, deliverables and recommendations *(relevant to RODRIGUE)*	
Innovative Traffic Management Techniques / Product Assessment – Trial Report – Evaluation Of Vehicle Proximity Detection System (90Kb) Innovative Traffic Management Techniques / Product Assessment – Trial Report - Effectiveness Of “Workforce In Road – Slow” Vms Legend For Traffic Manag (87Kb) Innovative Traffic Management Techniques / Product Assessment – Trial Report – Field Assessment Of Remotely Controlled Signs (86Kb) Innovative Traffic Management Techniques / Product Assessment – Trial Report – Assessment Of Fluorescent Yellow Microprismatic Material For Temporary (86Kb) Innovative Traffic Management Techniques / Product Assessment – Trial Report - Evaluation Of Sequential Flashing Cone Lamps. (108Kb)	
The results are relevant to be used along with other evidence in the formulation of policy when they may be subject to further critique and challenge.	
Project’s future perspectives	

Project card	***B.17 Developing Safenet for rural roads***
General Info	UK Contractor: TRL project value: £230,000 ; reference : YY91853 11/2003 – 12/2007
Key Objectives	Safenet is a computer program that predicts the frequency of personal injury road accidents on urban road networks. Much of HA's (Highways agency) network is rural so Safenet's use is limited. A scoping study has shown that it is possible to develop a version of Safenet for rural roads and that it would bring operational benefits for HA. project objectives: • Support for the Watchman role carried out by Agents. • Improved safety evaluation of improvement schemes, including development led schemes, before they are built. • Improved management of roadworks and diversion routes. • Improved targeting of safety remedial work and improved predictions of the benefits that would result from the remedial work. • Encourage better use of resources by identifying the areas and locations where the road network is underperforming with respect to safety.
Key Activities	R&D contract will incorporate rural road models into the existing Safenet program, which will then be offered with training and maintenance to HA Area Agents.
Relevance to RODRIGUE	
RODRIGUE Topic	*Output relevant to the RODRIGUE Topic*
1. DIAGNOSIS	
2. COMMUNICATION	
3. INFORMATION	
4. RISK	
5. ACTION	
6. EVALUATION	
Project reports, deliverables and recommendations *(relevant to RODRIGUE)*	
Not Published	
Project's future perspectives	

Project card	**B.18 Improved risk assessment for surface condition**
General Info	UK Contractor: TRL project value: £165,000 ; reference : Y201290 04/2004 – 08/2005
Key Objectives	Operate a specialist investigations service on a call off basis to provide (as appropriate): detailed SCRIM survey, measurements of peak and sliding friction with the HA Pavement Friction Tester, use of friction measurements and/or road profile measurements in the vehicle handling model, expert site investigation and interpretation. Update the accident database with recent data and detailed data on surface profile and determine network level trends of the effect of surface profile/geometry on accident risk. Develop a method for quantifying risk and benefits of treatment.
Key Activities	Complement the routine measurement of skid resistance by detailed investigations for sites with complex skid resistance patterns or requirements or in response to accidents relating to the surface conditions. Develop a better understanding of the interaction between surface friction and road profile/geometry and the impact on accident risk through a combination of these specialist investigations and network accident analyses. Develop methodology for quantifying risk and benefits of treatment.
Relevance to RODRIGUE	
RODRIGUE Topic	*Output relevant to the RODRIGUE Topic*
1. DIAGNOSIS	
2. COMMUNICATION	
3. INFORMATION	
4. RISK	Detailed assessment of road condition and interpretation in respect to impact on accident risk for individual sites leading to better methods for risk assessment and identification of sites with potential for safety improvements, taking into account e.g. skid resistance in different lanes and the effect of road surface profile/geometry. Assessment of the vehicle-handling model as a tool for this purpose. Publication of case studies to promote effective investigation and use of specialist services where appropriate.
5. ACTION	
6. EVALUATION	
***Project reports, deliverables and recommendations** (relevant to RODRIGUE)*	
Not published	
Project's future perspectives	

Project card	*B.19 Long term safety & effectiveness study – Safety messages on VMS*
General Info	UK Contractor: Mott Macdonald project value: £150,000 ; reference : YY92015 06/2005 – 03/2007
Key Objectives	Competitive tender will appoint a consultant,, to undertake a study that will examine the long-term effects of displaying road safety campaign messages on electronic Variable Message Signs (VMS). The study will consist of an off-road trial and on-road trial. The objectives of the trial are: 1. to determine the immediate and long-term effects of displaying safety messages on VMS, 2. to establish how the risk, of a driver failing to read a tactically important message, changes as the frequency and concentration of safety messages varies, and 3. to ascertain the optimum level of usage, that VMS can safely be used to display campaign messages, without unduly compromising their use for incident management purposes
Key Activities	This research project will include an off road trial to measure the effectiveness of safety messages displayed on VMS.
Relevance to RODRIGUE	
RODRIGUE Topic	*Output relevant to the RODRIGUE Topic*
1. DIAGNOSIS	
2. COMMUNICATION	
3. INFORMATION	This research project will include an off road trial to measure the effectiveness of safety messages displayed on VMS.
4. RISK	
5. ACTION	
6. EVALUATION	
Project reports, deliverables and recommendations *(relevant to RODRIGUE)*	
Not published	
Project's future perspectives	

Project card	***B.20 Dynamic Road Marking / feasibility study***
General Info ***Needs more information***	UK Contractor: WSP Ltd project value: £75,000 ; reference : Y203169 10/2004 – 03/2007
Key Objectives	Technology review / proving
Key Activities	A review of the application of Dynamic Lane Marking, the impact of implementation and feasibility of use in applications such as Hard Shoulder running
Relevance to RODRIGUE	
RODRIGUE Topic	*Output relevant to the RODRIGUE Topic*
1. DIAGNOSIS	
2. COMMUNICATION	
3. INFORMATION	Report and recommendations of applicability and specification
4. RISK	
5. ACTION	
6. EVALUATION	
Project reports, deliverables and recommendations *(relevant to RODRIGUE)*	
Not published	
This project recommends progression to an evaluation stage after researching current DRM products and establishing contacts with manufacturers	
Project's future perspectives	

Project card	***B.21 Dynamic Road Marking / evaluation***
General Info	UK Contractor: WSP Ltd project value: £210,000 ; reference : Y203169 11/2005 – 03/2007
Key Objectives	This project is an investigation into dynamic road marking technologies that can be used to replicate white lines. This evaluation will specifically consider the application of through-junction hard shoulder running and other Highways Agency projects that may benefit from DRM technology.
Key Activities	
Relevance to RODRIGUE	
RODRIGUE Topic	*Output relevant to the RODRIGUE Topic*
1. DIAGNOSIS	
2. COMMUNICATION	
3. INFORMATION	Phase 1 of this project has already been undertaken and is complete. This was the feasibility study undertaken by WSP (2.23). This recommended progression to an evaluation stage after researching current DRM products and establishing contacts with manufacturers. The Evaluation phase, commencing in Nov 2005, will entail an off-road trial and optical tests on a number of DRM products to establish the performance requirements needed to replicate a white line.
4. RISK	
5. ACTION	
6. EVALUATION	
Project reports, deliverables and recommendations *(relevant to RODRIGUE)*	
The Evaluation of Dynamic Road Markings for White Line Replication - ITS World Congress 2006, Dene Percy, Amanda Wilson, Kerry Lambton	
Project's future perspectives	

Project card	***B.22 Design Guidelines for In-Vehicle Information Systems Producers***
General Info	UK Contractor: TRL Limited project value: £42,500; reference : UG340 07/2000 – 02/2002
Key Objectives	The main objectives of this research project are to identify gaps in the existing standards and guidelines so as to make them compatible with the detailed human machine interface checklist, which has been produced to assess such systems.
Key Activities	This project delivered the design guidelines, in the form of a report, as expected. They provide both normative data and an extensive list of further useful reference documents.
Relevance to RODRIGUE	
RODRIGUE Topic	*Output relevant to the RODRIGUE Topic*
1. DIAGNOSIS	
2. COMMUNICATION	
3. INFORMATION	This information and awareness theme project has provided a systematic review of the many factors that need to be considered in the design process of in-vehicle information systems (IVIS). It intends to identify gaps in the existing standards and guidelines so as to make them compatible with the detailed human ma-chine interface checklist that has been produced to assess such systems. The document could then be recommended, to systems manufacturers and providers, as a product design guideline for In-Vehicle In-formation Systems. The project thus complies with the following sub themes of information and aware-ness: real time driver information systems; travel awareness campaigns; public transport and passenger information systems; and personal and other travel information services and systems.
4. RISK	
5. ACTION	
6. EVALUATION	
Project reports, deliverables and recommendations *(relevant to RODRIGUE)*	
not published	
PA 3721/01. Design Guidelines for Safety of In-Vehicle Information Systems ; Contact: gulam.rai@dft.gsi.gov.uk	
Project's future perspectives	

Project card	**B.23 APVRU**
General Info	Advanced Protection of Vulnerable Road Users UK Contractor: Jaguar Cars Ltd, TRL Limited, InfraRed Integrated Systems Ltd, University of Surrey project value: £246,000; reference : UG340 08/2000 – 04/2004
Key Objectives	The programme intends to specify the required features of the sensor system, develop the system, and the necessary logic to permit the system to 'see' and 'distinguish' between pedestrians, animals and inanimate objects and finally to demonstrate the capabilities of the chosen system on a vehicle. The work will be complemented in parallel with an extensive look at human factors and accident statistics, to quantify potential benefits and to identify any further development areas. The societal savings from such a programme, if successful and universally adopted, have the potential to be very significant.
Key Activities	
Relevance to RODRIGUE	
RODRIGUE Topic	*Output relevant to the RODRIGUE Topic*
1. DIAGNOSIS	
2. COMMUNICATION	
3. INFORMATION	
4. RISK	
5. ACTION	This project demonstrated the feasibility of using a combination of radar and infrared technology to detect pedestrians and trigger appropriate protective systems. The planned outputs were generally delivered as anticipated and the in-car system demonstrator developed as part of the project was particularly impressive. It was agreed that a live demonstration of a deploying pedestrian protection system was beyond the scope of the project and that a simulation using jaguar computer modelling was adequate to demonstrate the feasibility of the system. The results were generally credible and any areas where caution is needed in interpreting the results are clearly identified in the report.
6. EVALUATION	
Project reports, deliverables and recommendations *(relevant to RODRIGUE)*	
PR/SE/504/02. The Advanced Protection of Vulnerable Road Users (APVRU). Phase One Report PR/SE/970/04. The Advanced Protection of Vulnerable Road Users (APVRU). Final Report Author: TRL Ltd on Behalf of the APVRU Consortium ; unpublished Contact: ian.knowles@dft.gsi.gov.uk	
Project's future perspectives	

Project card	*B.24 PROBE-IT*
General Info	Probe Vehicle Information for Traffic Management and Road Network Operations UK Lead: WS Atkins Transport Systems, other partners: Jaguar Cars Ltd, Navigation Technologies, University of Southampton, Kingston University, Essex County Council project value: £ 960,220 this project is closed
Key Objectives	The aim of the project was the development of a fully working system for the transmission of position-related information from a dynamic database to in-vehicle systems. The overall objective was to demonstrate an end-to-end process of information transfer utilizing emerging commercially-available, wireless communications technology. The process was developed in three phases: non-dynamic data flow; dynamic data flow and floating vehicle application.
Key Activities	The Probe-IT project implemented and demonstrated a framework for the sourcing and exchange of geo-referenced information between traffic management systems, an integrated data source and in-vehicle systems such that the data is always timely and accurate. The technology used to implement the framework is widely available and comprises GPRS as wireless communication medium and the Travel Information Highway (TIH) in conjunction with the Internet for fixed communications. In 2001, when this project began, this technology was new and innovative. To demonstrate the framework, the project has implemented navigation and traffic regulations advice (speed and waiting restrictions) as in-vehicle applications.
Relevance to RODRIGUE	
RODRIGUE Topic	*Output relevant to the RODRIGUE Topic*
1. DIAGNOSIS	
2. COMMUNICATION	
3. INFORMATION	
4. RISK	
5. ACTION	
6. EVALUATION	
Project reports, deliverables and recommendations *(relevant to RODRIGUE)*	
Probe-IT Presentation from Project Review Day, 6th February 2006 View	
Project's future perspectives	

Project card	***B.25 Intelligent Speed Adaptation Project***
General Info	UK Contractors: ITS Leeds / MIRA Completion Date : 03/2006
Key Objectives	Intelligent Speed Adaptation (ISA) is one of the most promising Intelligent Transport Systems in terms of its potential impact on safety. It is a system by which the vehicle "knows" the permitted or recommended maximum speed for a road. The standard system uses an in-vehicle digital road map onto which speed limits have been coded, combined with a positioning system such as the satellite Global Positioning System (GPS), but could also be GPS enhanced with map matching and dead reckoning.
Key Activities	The main tasks of the project are to: Investigate user behaviour with ISA by means of set of field trials. Study overtaking behaviour with ISA in a driving simulator. Prepare an ISA design for motorcycles and large trucks and to build a demonstrator of each to showcase the technology. Prepare a system architecture for a mass production configuration of ISA. Have an input into relevant standards activities at an international level. Carry out a process of technology watch throughout the project duration. Further investigate the costs and benefits of ISA.
Relevance to RODRIGUE	
RODRIGUE Topic	*Output relevant to the RODRIGUE Topic*
1. DIAGNOSIS	
2. COMMUNICATION	
3. INFORMATION	
4. RISK	
5. ACTION	
6. EVALUATION	
Project reports, deliverables and recommendations *(relevant to RODRIGUE)*	
Project's future perspectives	

Project card	*B.26 Development of Human-Machine Interaction (HMI) Standards*
General Info *Needs more information*	UK Contractors: TRL Limited 05/1995 – 05/2006 budget: £257,250
Key Objectives	
Key Activities	
Relevance to RODRIGUE	
RODRIGUE Topic	*Output relevant to the RODRIGUE Topic*
1. DIAGNOSIS	
2. COMMUNICATION	
3. INFORMATION	
4. RISK	
5. ACTION	
6. EVALUATION	
Project reports, deliverables and recommendations *(relevant to RODRIGUE)*	
Project's future perspectives	

Project card	***B.27 Simulator Standardised Assessment of IVIS***
General Info **Needs more information**	UK Contractors: TRL Limited 08/2001 – 08/2003 budget: £101,700
Key Objectives	
Key Activities	
Relevance to RODRIGUE	
RODRIGUE Topic	*Output relevant to the RODRIGUE Topic*
1. DIAGNOSIS	
2. COMMUNICATION	
3. INFORMATION	
4. RISK	
5. ACTION	
6. EVALUATION	
Project reports, deliverables and recommendations *(relevant to RODRIGUE)*	
Project's future perspectives	

Project card	***B.28 Intelligent Vehicle - Intelligent Roads: Road Traffic Advisor***
General Info	UK Contractors: TRL Limited 02/1997 – 01/2002 budget: £204,000 ; reference : 73Y62888 (N517)
Key Objectives	The project aims to support the HA interest in intelligent highways and vehicles in two ways. The first is to provide technical research input to the HA contribution to the Road Traffic Advisor (RTA) project, particularly in the development of infrastructure to provide information to vehicle occupants and to receive travel condition information from equipped vehicles. The second part of the project is to review developments in driver assistance and automatic vehicle control fields and to identify areas where the HA may wish to commission work.
Key Activities	
Relevance to RODRIGUE	
RODRIGUE Topic	*Output relevant to the RODRIGUE Topic*
1. DIAGNOSIS	
2. COMMUNICATION	
3. INFORMATION	
4. RISK	
5. ACTION	
6. EVALUATION	
Project reports, deliverables and recommendations *(relevant to RODRIGUE)*	
Not published	
A demonstration system was assessed and a number of unpublished reports on intelligent vehicle and highway systems as well as a literature review on Intelligent vehicle – Intelligent roads have been produced.	
Project's future perspectives	

Project card	***B.29 EDmap***
General Info	US; Coordinator: NHTSA http://www-nrd.nhtsa.dot.gov/departments/nrd-12/pubs_rev.html
Key Objectives	Proof-of-concept for basic map-enabled safety applications, with a key focus on developing map database specifications and evaluating the challenging of creating high-detail maps to support these applications.
Key Activities	Main applications investigated among 33 specified in terms of advisory, warning and control level: - curve speed assistance (warning and control), - stop sign assistance (warning and control), - forward collision warning, - traffic signal assistance (warning), - lane following assistance (warning). For each application: map implications, demonstration, map database commercial feasibility, communications and wireless technology.
Relevance to RODRIGUE	
RODRIGUE Topic	*Output relevant to the RODRIGUE Topic*
1. DIAGNOSIS	For each of the applications, map database derived information, called mapplets, was defined based on the application requirements. The mapplet specifications were then used to drive the processes needed to build the EDMap databases. Each application is identified as a WHATROAD, WHICHLANE, or WHEREINLANE dependent application. In increasing order of map matching accuracy, a WHATROAD application needs road-level map matching to operate; a WHICHLANE application requires map matching to a particular lane to operate, and finally a WHEREINLANE application requires map matching laterally within a lane to operate.
2. COMMUNICATION	
3. INFORMATION	Each demonstrated application implemented different display and/or haptic systems to convey advisory or warning information to the driver.
4. RISK	The information is given ahead of difficulties (curve, intersection, forward collision, lane departure) when the speed is higher than an “appropriate speed” calculated from the mapplets (curvature, lane geometry, etc.).
5. ACTION	
6. EVALUATION	
Project reports, deliverables and recommendations *(relevant to RODRIGUE)*	
http://www-nrd.nhtsa.dot.gov/pdf/nrd-12/CAMP/ EDMap%20Final%20Report/Main%20Report/FinalRept_111904.pdf http://www.ivsource.net/modules.php?name=IV_Archives&file=article&sid=122	
Vehicle positioning capability is in the critical path for deployment (WHATROAD, WHICHLANE, WHEREINLANE).	
Map content optimizations were achieved through a variety of means, and the result was that mapplets were culled from the original requirements list and map creation effort was reduced.	
Project’s future perspectives	
No follow-up, but topics identified for investigation: hybrid databases (with lane-level information for some road sections), data collection and maintenance using probe data, quality mapplets for reliability.	

Project card	B.30 Quantification of the effect of different types of construction, design and operation on the safety of country roads
General Info	BAST project 82.311 – on going Germany
Key Objectives	This project is intended to create a basis for evaluating the effect of various types of construction, design and operation on the safety of country roads. Established for this purpose is a large store of empirical data based on evaluations of police records of accidents, as well as accident statistics gathered at the state level. These data are used to ascertain the safety effects of a number of construction, design and operational variants represented by differentiated, accident key characteristics. A suitable method is used to summarize the accident key characteristics into basic key characteristics typifying the potential effects of construction, design and operational variants on safety. The results are processed to aid decisions by road construction agencies, perform safety audits and permit incorporation into relevant bodies of rules.
Key Activities	
Relevance to RODRIGUE	
RODRIGUE Topic	*Output relevant to the RODRIGUE Topic*
1. DIAGNOSIS	
2. COMMUNICATION	
3. INFORMATION	
4. RISK	
5. ACTION	
6. EVALUATION	
Project reports, deliverables and recommendations *(relevant to RODRIGUE)*	
Project's future perspectives	

Project card	*B.31 Road safety manual*
General Info	BAST project 03.389 – on going Germany
Key Objectives	The objective of the research is the compiling of a manual for a safe design of roads. On the one hand, this manual will provide an overview over the existing approaches for describing and evaluating the road safety of traffic facilities. On the other hand, it will make uniform and standardised evaluation criteria for the assessment of traffic facilities planned for road safety available and thus enable a calculated comparison with evaluations in other target fields. The manual will indicate to planners and decision makers what possibilities there are to improve road safety and make the consideration and decision-making process more transparent as a whole.
Key Activities	
Relevance to RODRIGUE	
RODRIGUE Topic	*Output relevant to the RODRIGUE Topic*
1. DIAGNOSIS	
2. COMMUNICATION	
3. INFORMATION	
4. RISK	
5. ACTION	
6. EVALUATION	
Project reports, deliverables and recommendations *(relevant to RODRIGUE)*	
Project's future perspectives	

Project card	***B.32 Connection between distribution of speed and event of the accident on country roads – concept study***
General Info	BAST project 05.612 – on going Germany
Key Objectives	International discussions on the improvement of traffic safety have focused on the opinion that by reducing the actual speeds driven by 5 km/h, the number of victims who die in road accidents can be reduced by 11, 000 all over Europe. It is not clear under what basic conditions and on what part of the road network these statements apply to Germany, particularly to the extent forecast. A specification of the term "speed" also remains unclear from the discussions. In some neighbouring European countries there are already different regulations in permitted maximum speeds on country roads. Thus, in Switzerland, it is 100 on expressways and 80 on other roads outside city limits. In the Netherlands there is a graded speed regulation, 100/80/60 km/h depending on the network function of the road. In view of this, the question of the connection between distribution of speed and number of accidents arises as well as the severity of accidents on country roads. The objective of the project is, based on an evaluation of national and international sources of literature, to work out a research concept for developing this issue in the area of country roads in Germany.
Key Activities	
Relevance to RODRIGUE	
RODRIGUE Topic	*Output relevant to the RODRIGUE Topic*
1. DIAGNOSIS	
2. COMMUNICATION	
3. INFORMATION	
4. RISK	
5. ACTION	
6. EVALUATION	
Project reports, deliverables and recommendations *(relevant to RODRIGUE)*	
Project's future perspectives	

3. Conclusions

This project review work has identified and selected 55 recent European (23) and national (32) projects relevant to RODRIGUE themes. It should be emphasized that projects have been chosen essentially for their relation to road diagnosis. Therefore projects which deal only with standalone in-vehicle systems have not been considered. A consequence of this is a clear under-representation of action means (as described in section 1) which are more treated in vehicle concerning project than in road projects.

Conclusions will deal with aggregated data and qualitative analysis of project review. Detailed analysis would be a very time-consuming work that cannot be performed in RODRIGUE scope. Points that will be emphasized in conclusion will be:

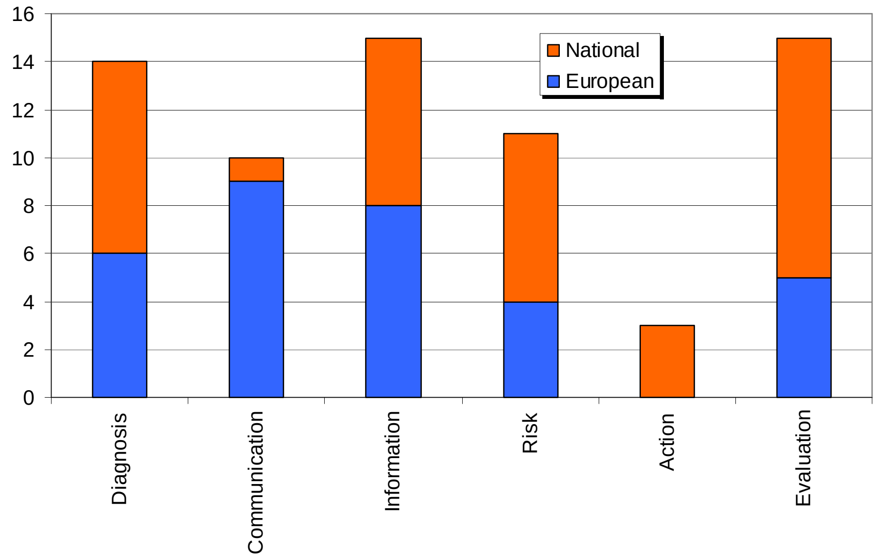
- number of projects which deal with each RODRIGUE topic;
- topics that are addressed at European vs. national level;
- as far as we have information about projects: type of results achieved;
- qualitative assessment of subjects completely covered by existing projects.

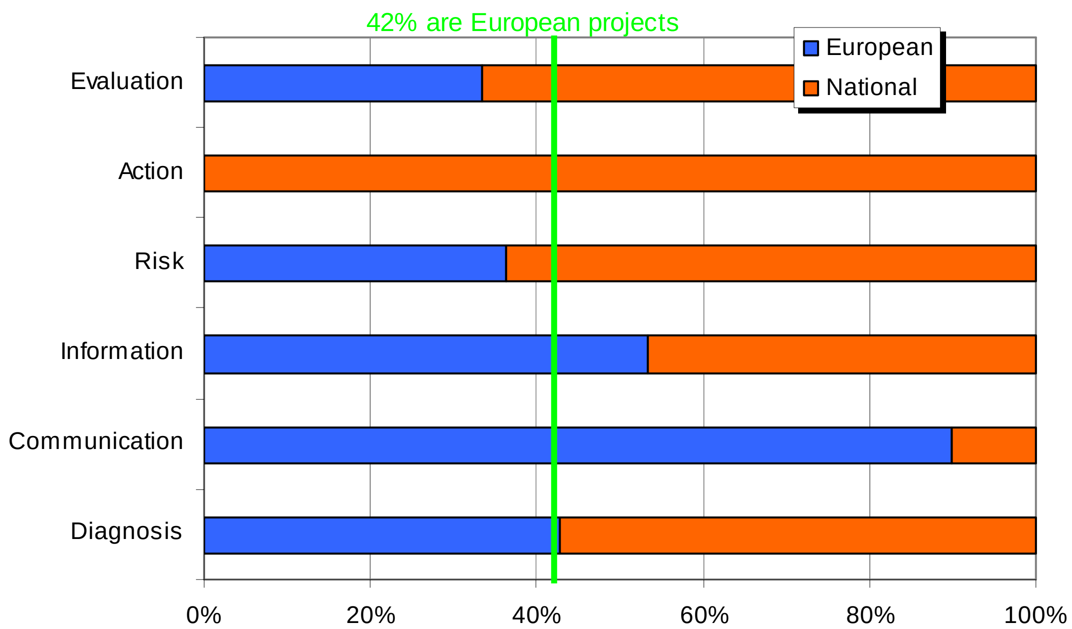
Following table handle number of projects which deal with each topic as defined in section 1.

		Diagnosis	Communication	Information	Risk	Action	Evaluation
Total	Major theme	14	10	15	11	3	15
	Minor theme	15	12	17	9	5	10
	Total	**29**	**22**	**32**	**20**	**8**	**25**
EU	Major theme	6	9	8	4	0	5
	Minor theme	7	6	6	3	1	1
	Total	**13**	**15**	**14**	**7**	**1**	**6**
Nat	Major theme	8	1	7	7	3	10
	Minor theme	8	6	11	6	4	9
	Total	**16**	**7**	**18**	**13**	**7**	**19**

The following charts (bleu and orange) all refer to major themes data.

Repartition of identified projects considering only major themes

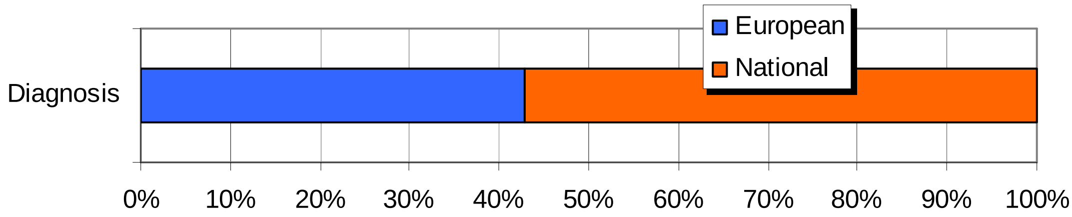


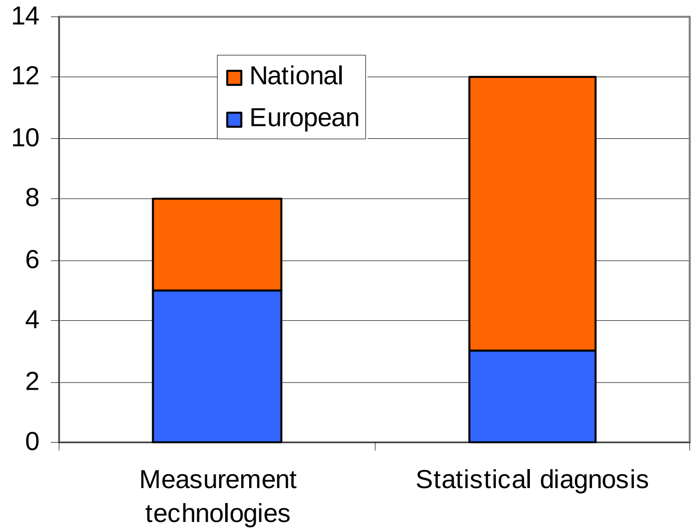


It appears that topics are not handled the same way in European and national projects. Some R&D or evaluation themes are more handled in a national way, some others are in the European field of competence:

- topics which meet standardisation requirements are more of European concern;
- demonstration actions related to local infrastructure are more of national concern.

9.3.2 Diagnosis





Diagnosis topic considers two sub-topics: measurement on the one hand and road statistical diagnosis on the other hand. Project review shows that both sub-topics are not relevant to the same type of consortium and financing scheme:

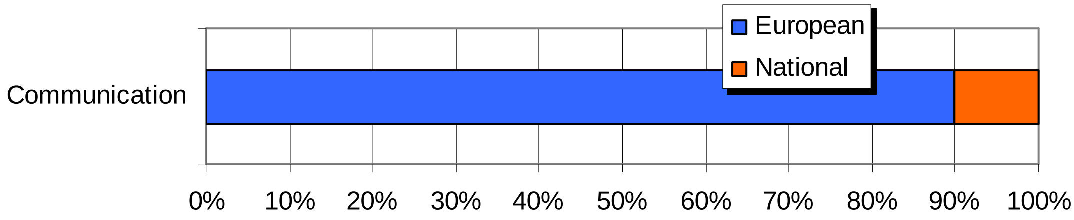
- measurement technologies related projects are considered at the European level, in order to capitalize on many stakeholders' skills: SMEs, car manufacturers, research institutes… They consider the way road and traffic characteristics can be measured;
- road statistical diagnosis is based on comparison between road data and accidentology databases. Thus it is more efficiently handled at national level as databases are not homogeneous between European countries, and national demonstrations of road/accidents correlation can have immediate counterparts in terms of road engineering or signalisation. Field operational tests are mostly handled in national projects.

For measurement technologies, several projects handle the friction and skid resistance measurement, either as static road characteristics, or as real-time characteristics of road-vehicle system. It appears to be a major research theme in the European road and automotive research community.

What remains to be done:

- to achieve common evaluation procedures for diagnosis systems and procedures

9.3.3 Communications

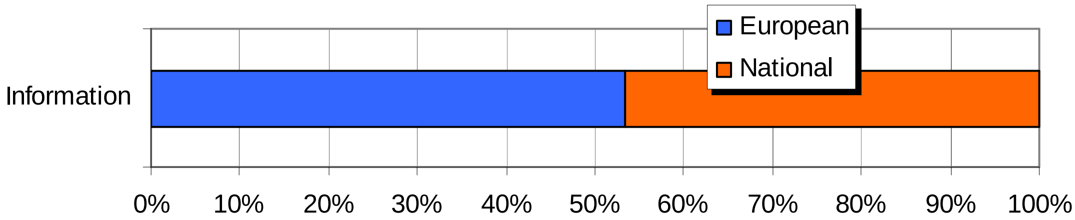


Communication themes must consider problems such as European countries inter-operability. Therefore communication projects are handled in European rather than national projects as European standardisation must be considered as soon as possible in systems development.

What remains to be done:

- to certify coherence between in-vehicle information and road signs: map-contained information about for example legal speed limits should be certified whenever security functions are based on them ;
- to complete harmonisation of European road signs and to use these signs on IVIS.

9.3.4 Information

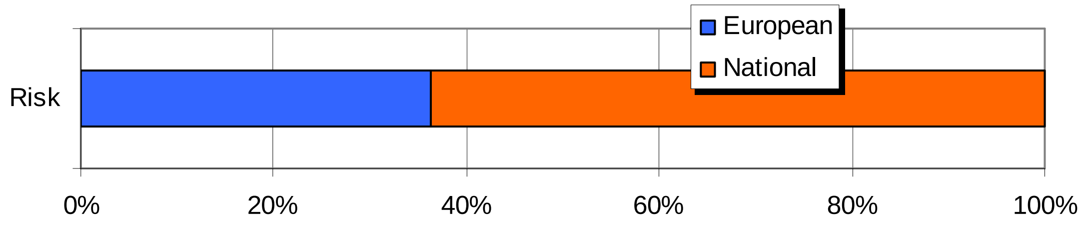


Information is more or less handled in a vast majority of projects, both European and national. But information-centered projects are not very numerous: one can notice AIDE project which copes with adaptive interface. Most of projects make use of HMI for demonstration purpose.

What remains to be done:

- to achieve common evaluation procedures for information delivery devices and signs.

9.3.5 Risk

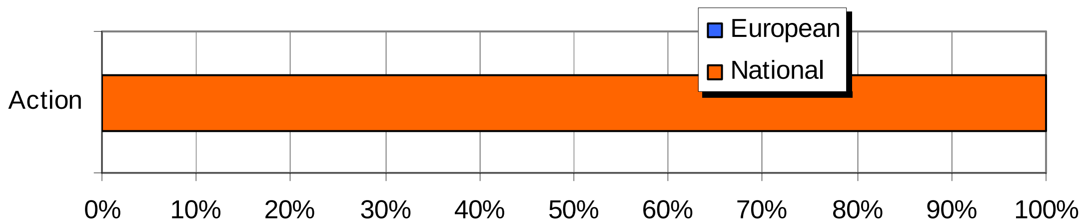


In this document, risk is related to real time or adaptive risk evaluation. Risk function concept is developed is some projects like SARI or PREVENT, either national or European.

What remains to be done:

- to complete work about risk functions;
- to initiate work about hierarchisation of risks and various ADAS superposition (for example: lane departure prevention and collision mitigation).

9.3.6 Action

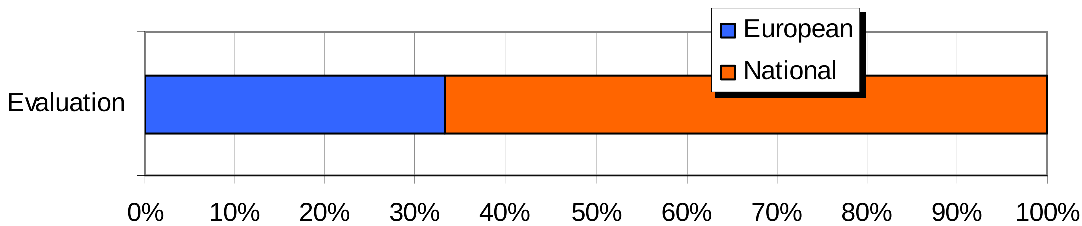


As identified projects are related to road diagnosis rather than to self-sufficient vehicle embedded systems, action means are quite badly handled therein. Furthermore, they are mode dealt with as a major theme at the national level in the identified projects.

What remains to be done:

- to achieve common evaluation procedures for action devices.

9.3.7 Evaluation



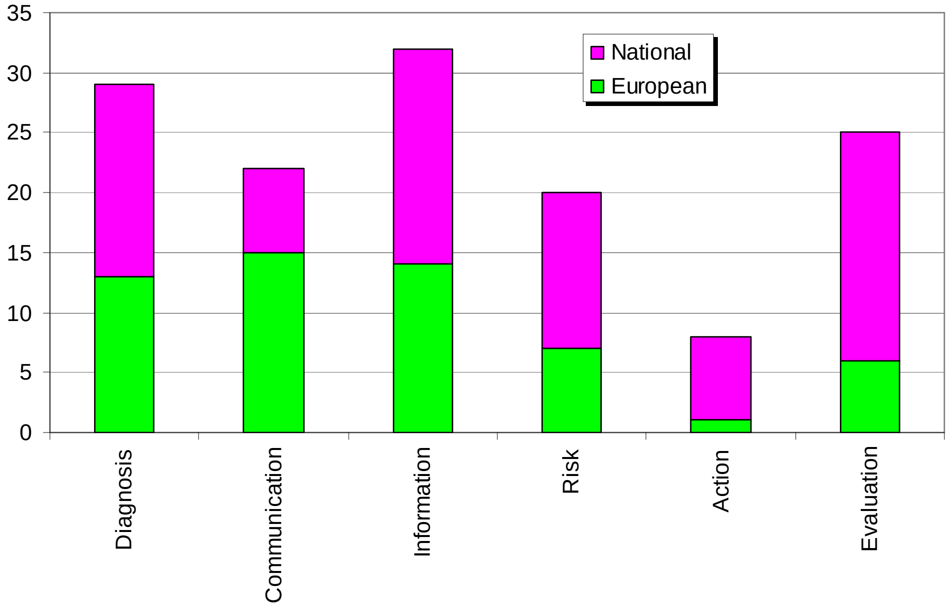
Evaluation is more and more a major concern in most of R&D projects. The greater proportion of projects dealing with evaluation at national level is explained by the fact that most FOTs are handled at this level (see for example LAVIA).

What remains to be done:

- FOTs have to be made in order to assess acceptability and efficiency of systems, procedures and devices developed in previous and future projects.

By considering the data for total themes (either major or minor topics), the results are quite the same, as one can see on the following chart:

Repartition of identified projects considering minor and major themes



Appendix: Scope of RODRIGUE

2006/12/01

RODRIGUE **RO**ad **D**iagnosis to sha**R**e **I**nformation and risk mana**G**ement with **U**s**E**rs (Interaction between infrastructure-vehicle-driver for a safer mobility)
Problems addressed 1. The road (profile, state and environment, traffic) may induce inappropriate or unsafe driver behaviours, or discrepancies between perception and use: how identify them? 2. How to reveal them to the designers and users? 3. How to avoid, prevent, and correct them, and if not possible, how to minimize their consequences?
Scientific and Technological Objectives 1. Diagnosis of infrastructure's use difficulties by recording and analysing vehicle trajectories, by infrastructure monitoring, above all under adverse meteorological conditions. 2. Assessment of a risk level for the road managers and for the drivers (road users) depending on the traffic, meteorological, infrastructure and signs conditions. 3. Improvement of tools for road management, signing, and on-board ADAS and services. 4. Evaluation of the proposed tools (acceptability, efficiency)
Innovations and Breakthroughs 1. New criteria for road design with respect of safety. 2. Instrumentation of road and vehicles for infrastructure dynamic diagnosis (trajectory observatory). 3. Definition of limit states (serviceability and ultimate) and associated accepted risk levels. 4. New systems of road signs and driver information to deliver warnings depending on the road, traffic, meteorological and environment conditions. 5. New applications for vehicle safety (targeted warnings depending on the vehicle, the driver and its driving conditions).
Results and deliverables 1. Methods and tools for road diagnosis with respect of users safety. 2. Risk indices and indicators for road managers and drivers. 3. Methods of road installations, signs and equipments monitoring. 4. Methods to assess the acceptability of such new systems and their impact on road safety.
Economic Impact and Benefits 1. Improvement of road safety. 2. Share and rationalise road diagnosis (methods of safety audit and control) and installations (case studies). 3. Harmonisation of European policy for road signing to prepare a sign mapping, and implementation of ADAS systems such as LAVIA (automated speed regulation with respect to the legal limits), extended to new signs and traffic data display systems, taking advantage of the positioning and navigation systems.

*

10 Appendix 2 : Users needs
Task 2

10.1 Introduction

This document intend to identify relevant research topics based on experts or users needs. Two means have been used in order to achieve this task :

- Section 1 will provide results of interviews with some European road administrations representatives. This interview process could not be completed because of external parameters.
- Section 2 analyses results of an Internet questionnaire, one can find on http://rodrigue.project.free.fr.

General conclusion of RODRIGUE works about future research topics are presented in final report. This task's report is appendix 2 of the final report.

10.2Section 1. Interviews reports

10.2.1 North European country Road Directorate

- This Directorate is a road administration organism.
- They are involved in many kinds of projects:
  - Road works: use of Internet and radio for driver information;
  - Speed limiters: they are beginning to complete de database for speed limits;
  - Demonstration project using speed limiters: a recorder is embedded in vehicles. A money return on insurance fees is made if recorded information does not show overspeeds during the past year.
- The national goal for road safety is to reduce injuries and killed by 40% between 2005 and 2012.
- They don't need further geometrical characteristics measurement means.
- They already use speed and interdistances measurement, and develop video vehicle and accident detection. for the moment, alert is manually generated.
- Before V2V communication is effective, road administration will have to control information communication to drivers. the economic model for in vehicle systems will be to share cost between administration (infrastructure) and drivers (in-vehicle systems).
- They need information about classification of vehicles and two-wheels counting.
- To incitate drivers to use ADAS and IVIS, the administration will go to more incitation, and will probably not use the compulsory way.
- They are interested in participating in demonstration projects.

10.2.2 West European country Highways Agency

- Highways Agency is in charge of road maintenance, and is a project operator. Another government department is in charge of road planning and construction.
- The national safety goal is to meet results target in a ten-year strategy to 2010, through "3E":
  - Engineering: road, skidding resistance, speed signalisation…
  - Education;
  - Enforcement.
- They have to provide technology to other departments: cameras, etc. for enforcement or traffic management. For example, they are using more and more electronic signs, automatically set by the traffic sensors. They are also involved in automatic weighing.
- Periodic measurements of road skidding resistance are performed.
- Highways Agency does not deal with vehicle action and systems.
- They feel that Vehicle-Infrastructure interactive systems will pose a problem during its deployment phase. Besides collection of individual driver or car information creates a legal problem.

- Furthermore, they will likely not promote active ADAS for the moment, but rather driver warning.
- They are involved in road users group who share information.
- They will probably choose incentive measures through insurance costs to deploy ADAS in vehicles. They will not use enforcement to deploy them.

10.2.3 East European country State Roads

- The respondent is part of the Traffic Safety Council which is working to fill traffic safety programs after evaluation of previous programs.
- The traffic safety agency is mainly in charge of education, traffic incidents information collection and traffic safety engineering. Operators are in charge of operational traffic safety measures.
- They don't have a fine knowledge of traffic accidents. They are far from western Europe countries in terms of traffic management and knowledge (400 killed/year). They just start to work on speed surveillance and regulation.
- They plan to introduce new projects in order to understand causes of accidents and localize black spots. They also plan road characteristics inventory.
- Road Authorities prepared a pilot project on video monitoring, used by drivers through Internet in order to check for congestion.
- In development of cooperative systems, they believe main user of the system should support the deployment cost.

10.2.4 East European country Road Administration

- This country has few automatic systems to collect road and traffic data on their 60,000 km of road.
- They collect traffic density, road classification, speed (3 or 4 checkpoints), roughness, road characteristics, and skidding resistance by periodic measurement. All these data can be related to weather conditions: freezing point causes an alert to signalisation devices, operators… with the objective of reducing time before salt deposition. 4 regional labs perform measurements, and regional national Administrations compare each other's results.
- The most important work topics in the future will deal with weather conditions, traffic jams at roadwork places, variable speed limit. Best solution would be to give information to each driver.
- It is essential to manage information system and use data the right way: it should be defined how the data will be stored and used before beginning collecting.
- They have a project with car insurance companies: actual vehicle speed would be correlated to map based limit speed; a signal would be emitted in case of long overspeed. There are problems of real-time actualisation and legal acceptance.

10.2.5 Conclusion of interviews

What can be sorted out of the interviews is summarized in the following items:

1. Some national road administrations are quite chilly about gathering individual data from light vehicles. This point poses legal issues about individual rights of drivers whose car transmit information.
2. Major concerns differ from one country to another as state of the art of road diagnosis, weather conditions and driver behaviour is not equivalent from north to south and from east to west of Europe. As an example, freezing is a prominent concern for cold-winter countries
3. Data management should be an important topic as more and more information will be gathered in the future: storage and analysis of huge amount of data, raw data storage duration, link with enforcement authorities, use of personal data.
4. Some road administrations appear not to be in favour of compulsory rules in deployment of safety systems (either for diagnosis or for action). They tend to prefer incentive measure: insurance fees reduction for instance. It is important to point out that on-board recorders are being installed in some country, related to insurance fees savings in case of good driving behaviour (for example relatively to speeds limits).
5. Economic considerations about deployment have to be taken into account as soon as possible in development process. In particular, deployment has to be designed so that the system provides some services in the transient phase.
6. It is not a road administrations task to contribute in developing on-board devices. It is devoted to car manufacturers or equipment manufacturers. Some administrations have in charge promotion of on-board systems for road safety an traffic management purpose.
7. Vulnerable users have to be taken into account in development of new information systems. Counting two-wheels vehicles is a stake by regard to road traffic analysis.
8. United States point of view on data management is that a third party is necessary for people to be confident that authorities will not have access to individual data collected through on-board diagnosis systems.

10.3 Section 2. Questionnaire analysis

Questionnaire can be found on http://rodrigue.project.free.fr on in appendices. It intends to provide information about road users and stakeholders needs in terms of research topics, on a quantitative basis.

10.3.1 Basic information on the feedback

99 answers have been stored in RODRIGUE's database at the end of January, 2008. More than 30% come from Belgian stakeholders, and Austrian, Swedish and French contribute each for about 15%. These differences come from diffusion channels used to inform road users about this survey: some RODRIGUE partners are more than other in contact with road administrations, operators, etc.

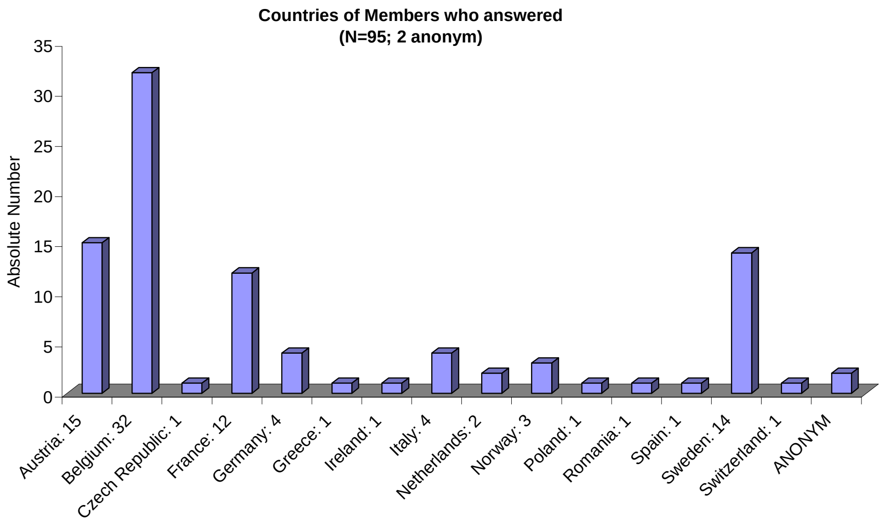


Figure 1: questionnaire respondents nationalities (based on 95 answers)

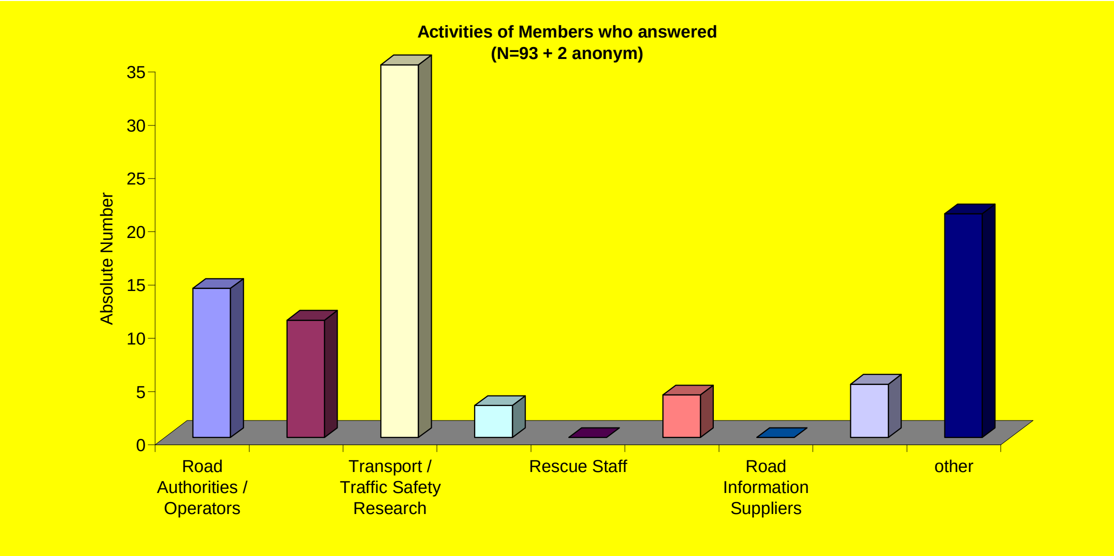


Figure 2: activities of questionnaire respondents (based on 95 answers)

A large part of people that have answered the questionnaire work in transport or traffic safety research; thus they are not representative of road operators, administration or other operational users of road information systems. It should be kept in mind that researchers are overrepresented in this survey.

These disparities have to be taken into consideration when analysing questionnaire results.

10.3.2 PART 1: Accidents parameters

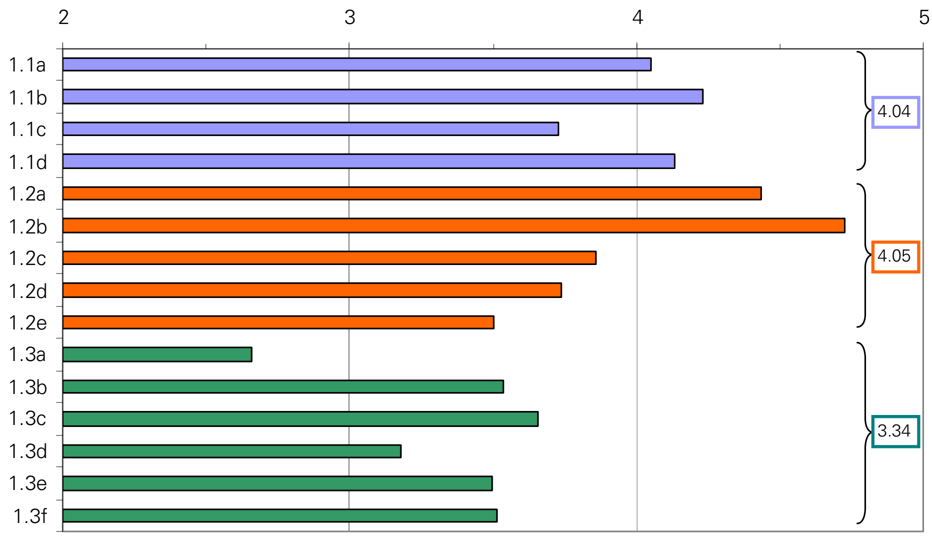


Figure 3: mean mark for each question of part 1, from 1.1 to 1.3. Please refer to questionnaire to get questions wording. Levels of answer go from 0 (no influence) to 5 (prominent influence)

Questions 1.1, 1.2 and 1.3 respectively refer to road characteristics, driver behaviour and vehicle characteristics. One can notice the following results:

- Vehicle characteristics are seen as having significantly less influence on road accidents than road and driver behaviour, including security components like ABS, ESP or tyres.
- The more influent individual parameters according to the respondents are driver behaviour (including alcohol and tiredness), driving speed and interdistances.
- Road characteristics and weather conditions are seen as more influent on accident than roadside equipments.
- Other influent parameters mentioned in questionnaires are: lack of driver experience, lack of attention (mobile phone use)…

10.3.3 PART 2: Users and stakeholders needs

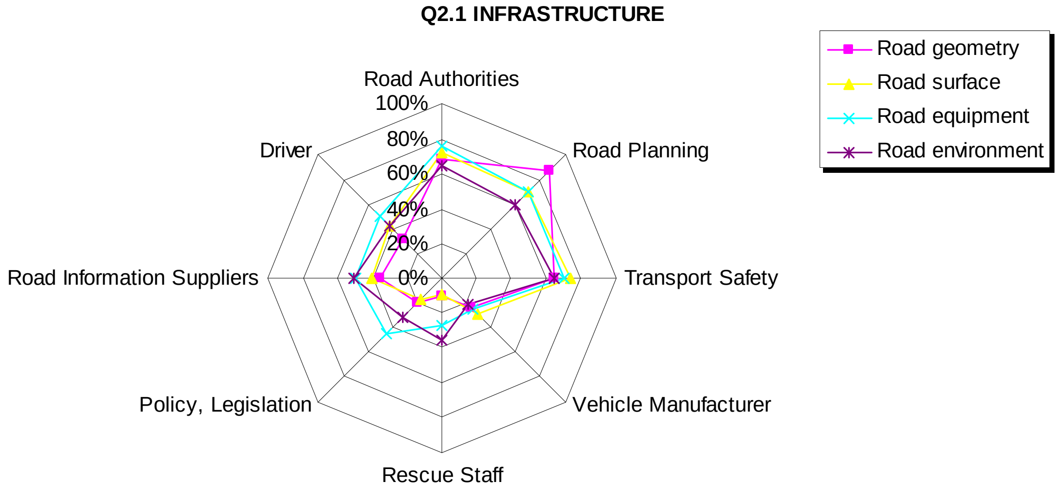


Figure 4: Q2.1 For which user groups will information about the following parameters be helpful for road & traffic management and safety? INFRASTRUCTURE parameters

Infrastructure information would be useful to many stakeholders. First ones are road planning and engineering organisms, followed by road authorities and transport safety researchers (we might keep in mind the weight or researchers in respondents).

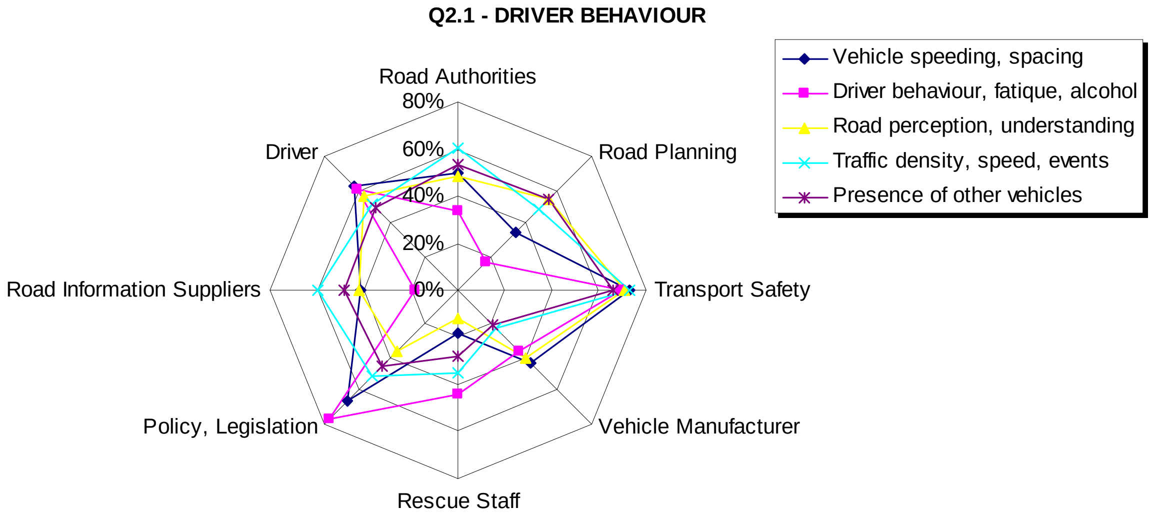


Figure 5: Q2.1 For which user groups will information about the following parameters be helpful for road & traffic management and safety? DRIVER BEHAVIOUR parameters

Individual driver related information is believed to be useful to researchers ("Transport safety"), policy entities and driver associations. Global information about traffic density and others are more important for road planning and engineering bodies.

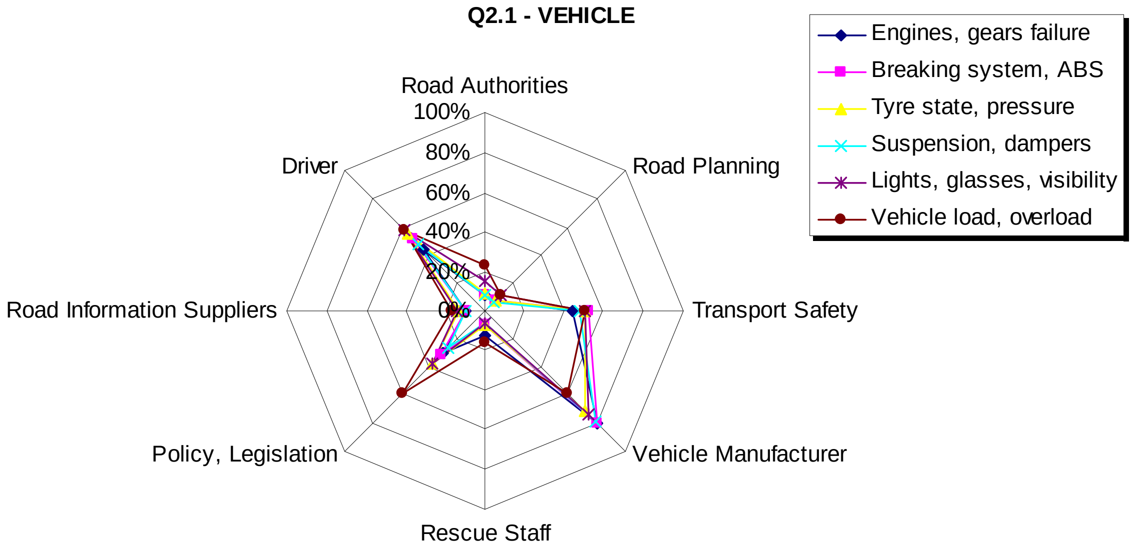


Figure 6: Q2.1 For which user groups will information about the following parameters be helpful for road & traffic management and safety? VEHICLE parameters

Vehicle related data are mainly useful for organizations related to vehicle: vehicle manufacturers (and components manufacturers), authorities and drivers.

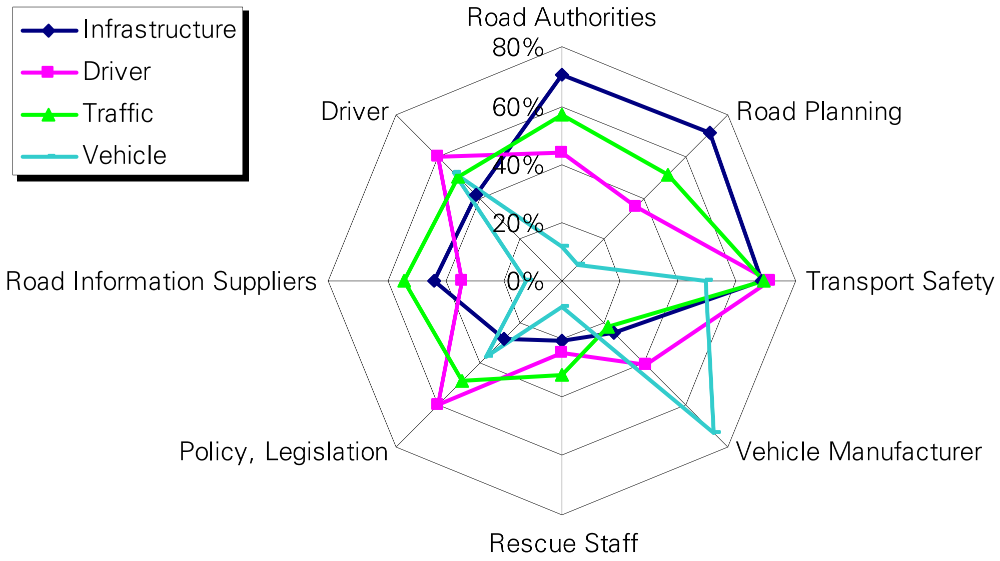


Figure 7: Q2.1 Synthesis

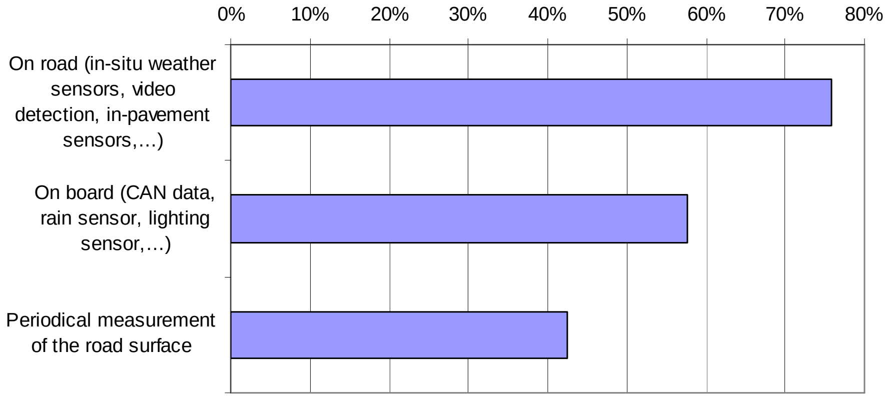


Figure 8: Q2.2: Which diagnosis to gather the data are the most helpful?

The more useful means to gather data about road and traffic are believed to be on-road sensors.

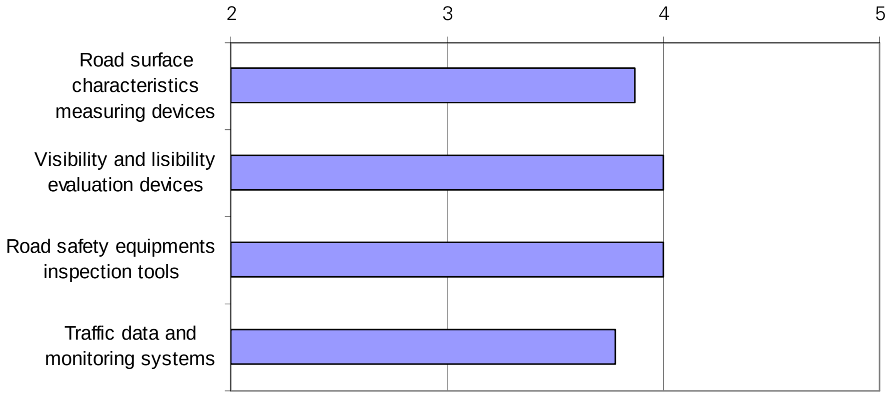


Figure 9: Q2.3: To what extent can the development of systems decrease the number of accidents?
→ Average mark for positive influence of devices development on accidentology

Question 2.3 does not provide significant information 4: all kinds of systems would have positive impacts on accidentology.

Regarding whether gathered information should be useful for developing new applications of active safety systems, and whether achievement of actual risk levels and risk factors can affect future road construction guidelines, respondents agreed to more than 80% (questions 2.4 and 2.5). It is widely admitted that new diagnosis standards will automatically change guidelines for road construction, for example by leading to some threshold changes in road parameters. Such developments would provide feedback loop to standardisation bodies. One points out that such diagnosis data would enable insurance companies to sue road authorities for dangerous road design.

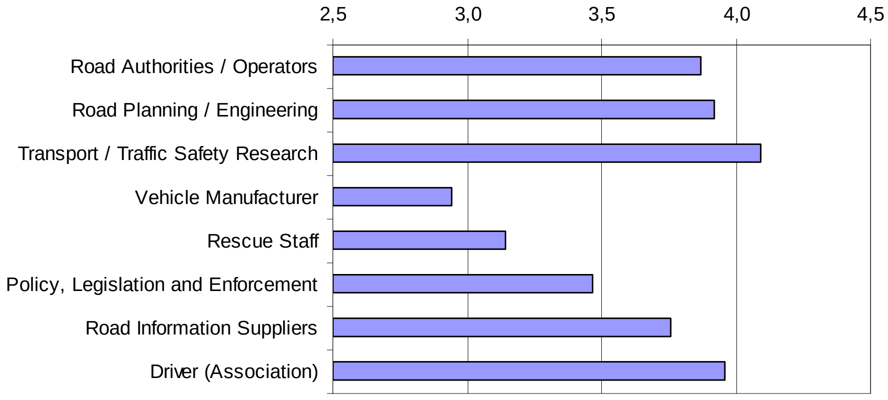


Figure 10: Q2.6: Do you think that the risk level information will have positive impact on the following user groups?

Risk level information could have positive impacts for road planning, engineering and operations. Driver is seen to get significant benefits too. We have to consider possible confusion in driver related answer between driver and drivers associations.

Besides, most of them (55%) believe that risk compensation theory would apply to these systems (question 2.7). Therefore risk compensation should be a major concern in safety devices development. In particular transition between “safe” or “intelligent” road to “not intelligent” road should be taken into account. In all driving situations, driver must remain sensitive to risk level.

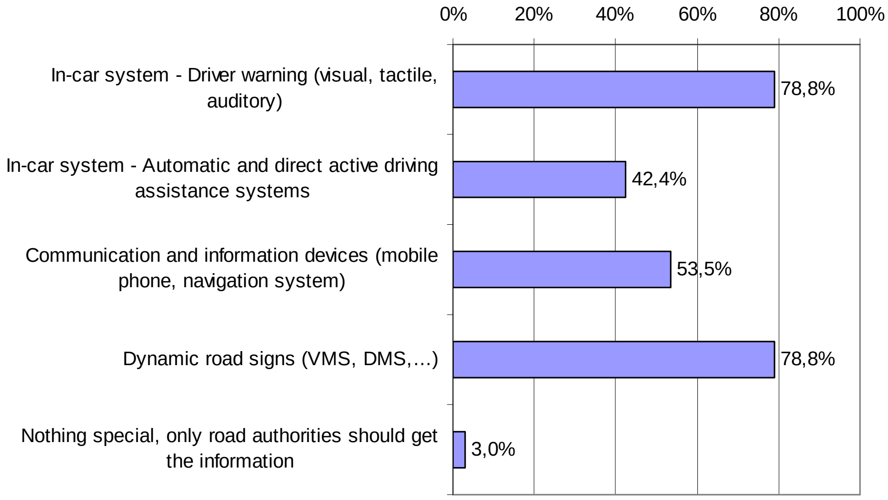


Figure 11: Q2.8: Which kind of tools would you, as a driver, prefer for being informed about a potential accident risk?

Not surprisingly, drivers prefer information and warning systems rather than more intrusive action devices.

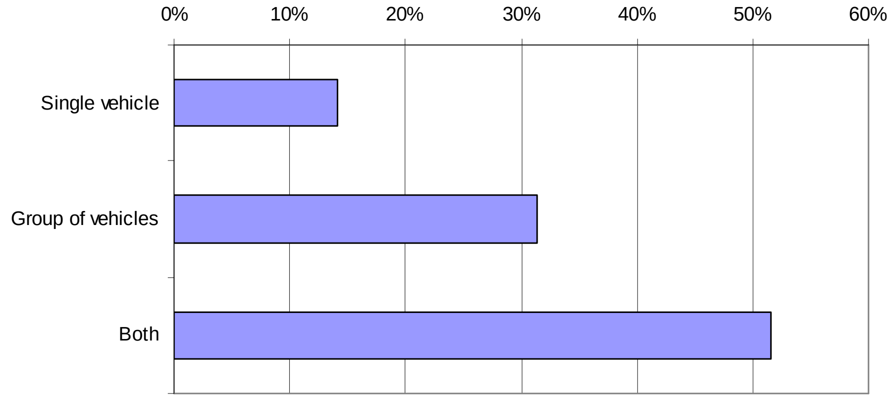


Figure 12: Q2.9: How should the risk level be preferably calculated on a specific road section? (for on vehicle, groups of vehicles or both)

Quite logically, it appears that risk level assessment is preferred to be made both for single vehicles and groups of vehicles.

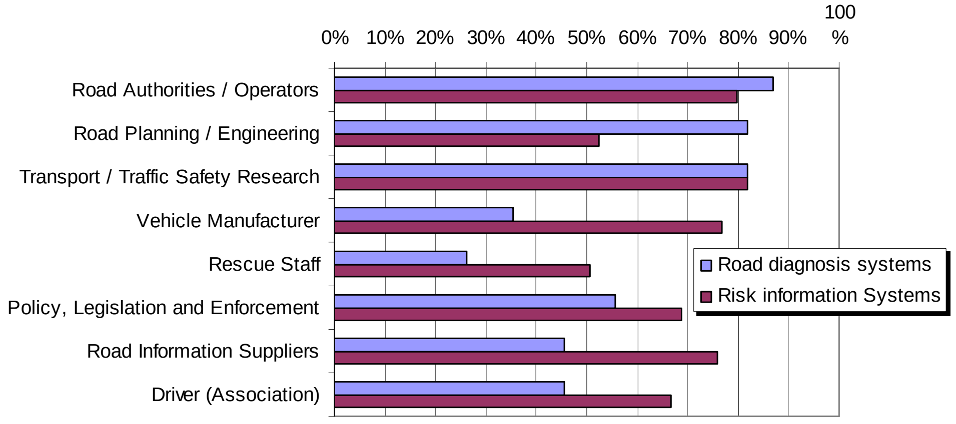


Figure 13: Q2.10: Which stakeholders should be involved in the development of road diagnosis systems and risk information systems?

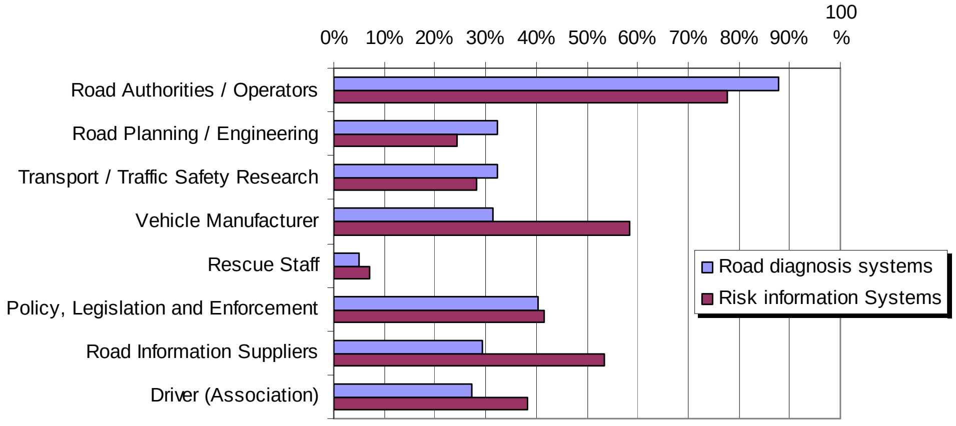


Figure 14: Q2.11: Which stakeholders should support the cost of the required infrastructure for road diagnosis systems and risk information systems? (multiple-choice answer)

As many road actors are to be involved in road diagnosis systems (RDS) development, more than 85% of respondents believe that deployment cost have to be mainly supported by road authorities and operators. Situation is less sharply defined for risk information systems (RIS): deployment costs should be shared between road authorities, vehicle manufacturers (i.e. in fine the driver) and road information suppliers.

Question 2.12 about whether acceptability of devices should be measured appears to be massively answered ‘yes”. Criteria for acceptability are detailed in Q2.13 answers hereunder.

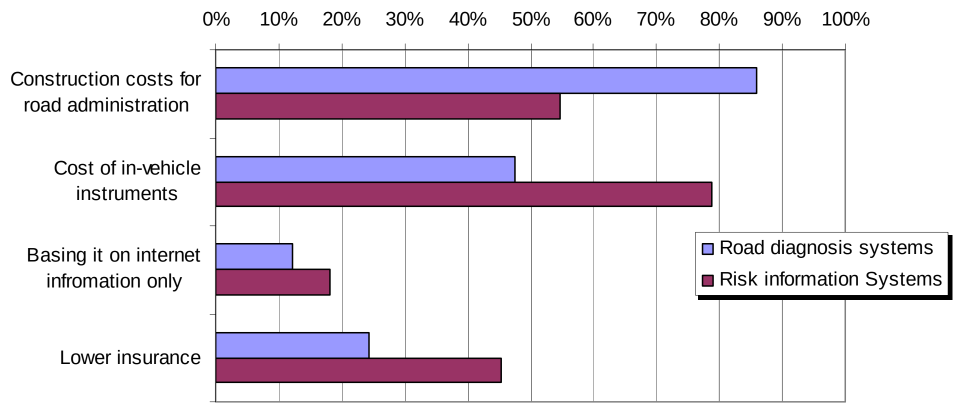


Figure 15: Q2.13: What do you think are the crucial issues for the acceptance of RDS and RIS? (Multiple-choice answer)

In all cases, costs are seen as being the major issue for acceptance of RDS and RIS: construction cost for road administrations in one case, cost of in-vehicle devices in the other case. For in-vehicle systems, insurance fees reductions could be an issue for 45% of respondents.

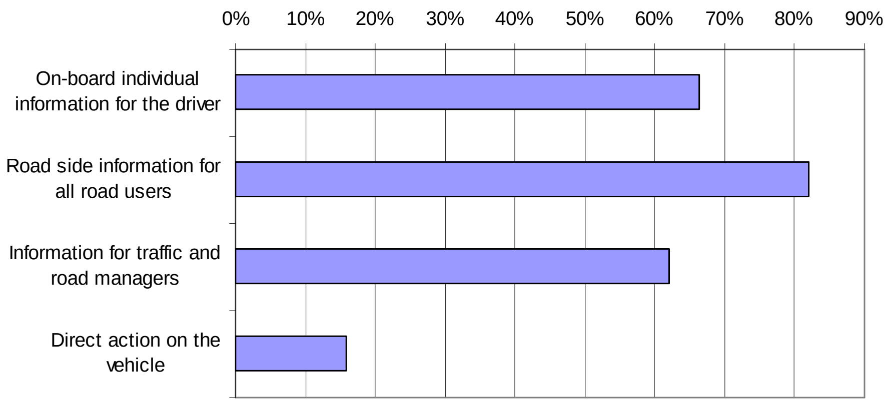


Figure 16: Q2.14: If a road section with an increasing risk level is identified, what is the best thing to do?

Q2.14 answers show that information to drivers and road operators might be privileged over direct action on vehicle. This answer is directly related to Q2.8 where the respondent takes place as the driver.

When asking if respondents would be interested in getting involved in systems development (Q2.15), 58% agreed. Analysis remains to be done about who are the volunteers (road operators, researchers, car manufacturers…).

10.3.4 Conclusions

In conclusion, the following points have to be considered:

1. Disparities in respondents profiles may have influence on statistical analysis. It should be kept in mind that researchers are overrepresented in this survey.
2. Vehicles parameters are not seen as prominent in accident parameters. This point is consistent with RODRIGUE topics of interest. Actually, stakeholders interested in vehicle data gathering are quite different than for other data (more traffic and road related).
3. Mainly road authorities should support system deployment costs for RDS, plus vehicle manufacturers and information suppliers for RIS.
4. Deployment should take into account systems costs, which are the more crucial issues for acceptance of the systems. A cost-benefit evaluation should be made in early phase of each development project and be taken into account in design phase when possible.
5. Business model for Intelligent Highways have to be developed. Insurance companies and all involved economic stakeholders should be involved in R&D projects in the earliest phases.
6. As a driver, respondent may privilege development of information systems rather than action devices. This position is consistent with many acceptability studies conducted in various projects (e.g. ARCOS).
7. Projects should not only consider highways but also rural roads. In this case, the deployment business model is not the same.
8. European standards have to be developed about road diagnosis and risk labelling of roads, cost-effectiveness of possible measures, and acceptance of systems.
9. As driver behaviour is a major parameter for road safety and traffic management, road design should be thought in order to infer the right behaviour.

11 Appendix: questionnaire

It can be answered on http://rodrigue.project.free.fr.

11.1 Part 1: Factors governing accidents

What is the level of influence of the following infrastructures parameters on an accident ?	Not at all	Very low	Low	High	Very high
Geometrical parameters: radius of curvature, length of bend, longitudinal and transverse slopes, distance of geometrical visibility, crossing and junction design, road and lane width, road side characteristics, obstacles.					
Road surface characteristics: skid resistance and texture, pavement unevenness and bumps, road marks, photometric properties, water, ice or snow					
Road equipment: road signs (vertical), light and visibility conditions at night, safety barriers, VMS					
Road environment: weather conditions, fog and rain, road and signs legibility….					

What is the level of influence of the following driver behaviours and traffic conditions on an accident ?	Not at all	Very low	Low	High	Very high
vehicle speeding, vehicle spacing					
driving behaviour, fatigue, alcohol, drugs					
road perception and understanding, task surcharge/overload					
traffic density, mean speed, speed variations, events (e.g. accident in the reverse direction)					
presence of other types of vehicles (trucks, motorbikes, bicycles) or pedestrians					

Vehicle characteristics: What is the level of influence of the following car parameters on an accident ?	Not at all	Very low	Low	High	Very high
engine's and gear's components or failure					
breaking system, ABS, EBS					
tyre state, pressure…					
suspension, dampers, steering system					
lights, glasses and visibility, …					
vehicle load, overload, asymmetrical loading, loss of luggages…					

Can you propose any other parameters with high influence ?

11.2 Part 2: End-users and stakeholders needs and requirements

For which user groups the information about the different parameters will be helpful for road and traffic management and safety? (Please tick the appropriate answers, level 0 to 4)

PARAMETERS	USER GROUPS								
	Drivers	Road authorities / operators	Road planner	Vehicle manufcaturer	Policy, legislation and enforcement	Traffic safety and crash research	Rescue staff	Road information suppliers	No body
Infrastructures • Road geometry • Road surface • Road equipment • Road environment									
Driver behaviour and traffic conditions • vehicle speeding, vehicle spacing • driving behaviour, fatigue, alcohol, drugs • road perception and understanding, task surcharge/overload • traffic density, mean speed, speed variations, events (e.g. accident in the reverse direction) • presence of other types of vehicles (trucks, motorbikes, bicycles) or pedestrians									
Vehicle • engine's and gear's components or failure • breaking system, ABS, EBS • tyre state, pressure… • suspension, dampers, steering system • lights, glasses and visibility, … • vehicle load, overload, asymmetrical loading, loss of luggages…									

Which diagnosis methods to gather the necessary data for the calculation of the risk level of a given road section are in your opinion the most helpful? (Please tick the appropriate answers)

☐ On road (in-situ weather sensors, video detection, in-pavement sensors, etc.)

☐ On board (CAN-Bus data, rain sensor, lighting sensor, etc.)

☐ Periodical measurement of the road surface conditions

Any other proposal :

To what extent can the development of the following tools for road diagnosis (with respect to the user safety) decrease the number of accidents?

	Not at all	Very low	Low	High	Very high
• Road surface characteristics (evenness, skid resistance, deflection…) measuring devices					
• Visibility and lisibility (road signs and marks, distance of visibility, light, etc.) evaluation devices					
• Road safety equipments (safety barriers, emergency lanes and parking, warning systems, etc.) inspection tools					
• Traffic data and monitoring systems (incl. Weigh-In-Motion)					

Any other proposal:

Should the gathered information (weather, road condition, surface parameters, geometry, etc.) also be used for developing new applications of active safety systems (e.g. intelligent ABS regulation, adjusted speed monitoring)? [Y / N]

Do you think that the achievements of actual Risk Levels or Risk Factors can affect future road construction guidelines? [Y / N] **If yes, how ?**

Do you think that the risk level information for a given road may have a positive impact on the following user groups?

	Not at all	Very low	Low	High	Very high
• Users, driver (impact on the driving task)					
• Road authorities / operators					
• Road planner (impact on the planning task)					
• Vehicle manufacturer					
• Policy, legislation and enforcement					
• Traffic safety and crash research					
• Rescue staff					
• Road information suppliers					

In the context of the “Risk Compensation Theory” which postulates that individuals will behave less cautiously in situations where they feel safer, do you think that “Intelligent Roads” or “Intelligent Vehicles” will induce new unsafe driving situations?

[Y / N] **If yes, how, and how to avoid such negative effects ?**

Which kind of tools would you, as a driver, prefer for being informed about a potential accident risk? (Please tick the appropriate answers)

☐ In-car system – Driver warning (visual, tactile, auditory)

☐ In-car system – Automatic and direct active driving assistance systems

☐ Communication and information devices (mobile phone, navigation system)

☐ Dynamic road signs (VMS, mobile VMS…)

☐ Nothing special, only the road authorities should get information and decide what should be done with it

How should the risk level be preferably calculated on a specific road section? (Please tick the appropriate answers)

☐ For single vehicles

☐ For groups (flows, platoons) of vehicles

☐ Both

Which stakeholders should be involved in the development of road diagnosis systems and risk information systems? (Please tick the appropriate answers or fill in the blank)

	Road diagnosis systems	Risk information systems
• Driver		
• Road authorities / operators		
• Road planner		
• Vehicle manufacturer		
• Policy, legislation and enforcement		
• Traffic safety and crash research		
• Rescue staff		
• Road information suppliers		
Any other		

Which stakeholders should support the cost of the required infrastructure to allow a cooperative system to work, being either a road diagnosis system or a risk information system? (Please tick the appropriate answers or fill in the blank)

	Road diagnosis systems	Risk information systems
• Driver		
• Road authorities / operators		
• Road planner		
• Vehicle manufacturer		
• Policy, legislation and enforcement		
• Traffic safety and crash research		
• Rescue staff		
• Road information suppliers		

Do you think that the acceptability of road diagnosis systems and risk information systems and their impact on road safety should be measured?

	Road diagnosis systems	Risk information systems
• Acceptability - legal - social - individual	[Y / N] [Y / N] [Y / N]	[Y / N] [Y / N] [Y / N]
• Road safety	[Y / N]	[Y / N]

What do you think are the crucial issues for the acceptance of road diagnosis systems and risk information systems? **(Please tick the appropriate answers)**

	Road diagnosis systems	Risk information systems
• Construction costs for the road administration		
• Costs of in-vehicle instruments		
• Basing it on internet information only		
• Lower insurance		
• Any other issues?		

If a road section with an increasing Risk Level is identified, what is the best thing to do? **(Please tick the appropriate answers)**

☐ On board individual information for the driver

☐ Road side information for all the road users

☐ Information for traffic and road managers

☐ Direct action on the vehicle

Are you interested in getting involved in developing such systems or further applications?

Road diagnosis systems **[Y / N]**

Risk information systems **[Y / N]**

If yes, add any remarks or proposals

11.3 Part 3: Personal Comments and Personal Information

Personal Comments on the content of the ideas having intelligent highways with intelligent cars; communication to each other or with a server, who calculates for you a specific actual Risk Level and gives feedback in different ways:

Personal Information (1): Please fill in the following lines

Sex: M / F

Age:

Organization / Affiliation:

Field of activity:
- ☐ Driver (association)
- ☐ Road authorities / operators
- ☐ Road planner
- ☐ Vehicle manufacturer
- ☐ Policy, legislation and enforcement
- ☐ Traffic safety and crash research
- ☐ Rescue staff
- ☐ Road information suppliers

Years of experience in respective field:

Personal Information (2): If you are interested in participation, please state your contact details.

Title(s):

First Name:

Family / Last Name:

Address:

City:

State:

Zip:

Country:

Telephone:

Fax:

E-mail:

12 Appendix 3: DaCoTA Call text

12.1 FP 7 Cooperation Work Programme: Transport - AREA: 7.2.4.2 Policy support

The continuing objective of further reducing the number of fatalities on the EU roads should be properly supported by research activities addressing in depth road accidents data collection and analysis in the framework of the European Road Safety Observatory, multidisciplinary analysis of the impact of societal trends on road safety (i.e. ageing population) and technology-based solutions to improve infrastructure related road safety. Research activities will include demonstration, validation and implementation of recognised best practices.

12.1.1 Expected impact:

- Contribution to the best possible level of road safety, beyond the common objective proposed by the Commission in 2001, following targets already set by some Member States ("sustainable safety" and the ultimate "vision zero").
- Development of capacities to explore potential road safety improvements that will not have been exploited by the ongoing actions within the 3rd European road safety action programme (2001-2010) and within the 5th and 6th framework programmes.
- Development of new mechanisms for exploiting existing data sources in standardized ways to facilitate analyses and comparison with other traffic crash related databases (already existing or under development).
- Definition of a strategic framework for the selection of pan-European priorities for in-depth data collection.
- Proposals must ensure at least a neutral impact on climate change.

12.2 SST.2008.4.2.1 Road safety Data Collection, Transfer and Analysis ("DaCoTA")

12.2.1 Objective

Road safety policy should be based on scientific evidence and the European pooling of knowledge is the most efficient way to transform knowledge into policy. European methods for macroscopic and in depth accident data collection, transfer and analysis have been developed and successfully tested, in particular, but not only, within projects of the 5th and 6th framework programmes.

Data collection, transfer and analysis at European level have reached various levels of maturity - depending on the category of data. Globally speaking, however, the whole process is still far from maturity.

12.2.2 Scope

Road safety data range from macroscopic level (systematic and comprehensive collection of accident reports, risk exposure data, performance indicators) to in-depth data. They also include data for road safety measures evaluation, policies benchmarking and data on behaviours / attitudes. A better integration of various categories of analyses, including data quality and data standardisation, is likely to result in a huge progress in knowledge.

There is a need for a better common understanding of the overall road safety dynamics. National models are needed to make forecasts, define road safety objectives and to support the development of programmes in the EU-27. It would be desirable to track, explain and forecast the evolution of victims (fatalities, and no doubt injuries) by country, and perhaps by region as well.

Some problems require multi-country comparisons, indeed. The diversity of trend patterns among the various countries, but also their similarity, suggests that there is lot to be gained from systematic international comparison and mutual exchange of competence, experience and data. A coordinated international research effort, drawing on data and models from all participating countries, is called for. The "Road safety Data Collection, Transfer and Analysis" ("DaCoTA") would be a policy-oriented pilot project building on previous EU-funded projects and implementing for the first time on a full scale what has been tested so far on limited scales. It should gather data and perform comprehensive policy analyses including a review of in-depth accident studies, either at European level or at countries level as a further development of the existing European Road Safety Observatory.