	# eSafety Support
Final release	**D1.3 eSafety Recommendation Note (December 2008)**

Author(s)	Alessandro Carrotta, ERTICO			
Project	eSafety Support			
Date	*Contractual:*	31/12/2008	*Actual:*	11/02/2009
Project Manager	Vincent Blervaque ERTICO-ITS EUROPE Tel: +32 2 400 07 24 E-Mail: v.blervaque@mail.ertico.com			

Abstract	The eSafety Recommendation Note is an update on the progress of the work performed to support the 28 Recommendations. The document is updated throughout the eSafety Support project period and is available in the eSafety Activities Database on the eSafety Support website. This version reports the progress until the second half of 2008.
Keyword list	Progress of the 28 Recommendations
Nature of deliverable	Report
Dissemination	Public

Project financially supported by	
	European Commission DG INFSO
Project number FP6-2004-IST-4_026912	

Control sheet

Version history			
Version number	**Date**	**Main author**	**Summary of changes**
1.0	30/12/2008	Alessandro Carrotta	Draft
1.1	11/02/2009	Alessandro Carrotta	Integrating part of experts' comments to the draft

Approval		
	Name	**Date**
Prepared	Alessandro Carrotta	30/12/2008
Reviewed	Vincent Blervaque (ERTICO), James Burgess (ERTICO), Maxime Flament (ERTICO), Risto Kulmala (VTT), Dolf Lamerigts (ACEA), Wolfgang Reinhardt (ACEA), Monica Schettino (ERTICO), Alan Stevens (TRL)	30/12/2008 - 11/02/2009
Authorized	Alessandro Carrotta	11/02/2009

Circulation	
Recipient	**Date of submission**
European Commission	11/02/2009

Report on the Progress of the 28 eSafety Recommendations

End-2008 Release

Report prepared by eSafety Support

Brussels, December 2008

Table of contents

CHAPTER 1 - INTRODUCTION 7

1.1 Objectives 7

1.2 How to read this progress report 7

1.3 Intended audience 8

CHAPTER 2 - PROGRESS OF THE 28 RECOMMENDATIONS 9

2.1 List of recommendations 9

2.2 Summary Progress of the 28 recommendations 9

2.2.1 Accident Causation Data 12
2.2.2 Impact assessment of safety systems 17
2.2.3 Human-Machine Interaction 33
2.2.4 Road Maps for Intelligent Integrated Safety 42
2.2.5 Intelligent Integrated Road Safety Systems including ADAS 50
2.2.6 The European Safety Map database 73
2.2.7 Emergency Calls (e-Calls) and E-112 80
2.2.8 Real-time Traffic and Traveller Information (RTTI) for road safety 90
2.2.9 Motor vehicle type-approval legislation 97
2.2.10 Safety systems standards and regulation in the EU: State of the art 101
2.2.11 Legal issues of market introduction of IIRSS 108
2.2.12 Ultra wide-band 24 GHz short range radar 113
2.2.13 Societal aspects 116
2.2.14 The different business cases 126
2.2.15 User Outreach 130
2.2.16 The eSafety Forum 138

CHAPTER 3 - CONCLUSIONS 147

CHAPTER 4 - ACKNOWLEDGEMENTS 161

Chapter 1 - INTRODUCTION

The eSafety High-Level meeting on 25 April 2002 called for the establishment of a Working Group tasked to further elaborate the European eSafety strategy, recommend actions and prepare for the next High-Level Meeting. The European Commission established this Working Group, which met four times in 2002. The final report of the eSafety Working Group from November 2002 lists 28 Recommendations for further action (see Chapter 2).

The monitoring of the advancement of the eSafety initiative's work towards its objectives was first undertaken by the eScope project (2004-2005) and since January 2006, is one of the tasks of eSafety Support. The goal is to track and highlight progress against such indicators defined with reference to eSafety targets, benchmarks etc.

The structure of the Progress Note used up to 2006 identifies the main actions undertaken for each of the recommendations. Since mid-2007, the edition of the report is structured in a more quantitative way (see section 1.1).

1.1 Objectives

The document provides an overview of the background and progress of the 28 eSafety Recommendations. Its aim is to show a qualitative monitoring approach to visualise this progress, thus allowing eSafety actors to quickly perceive how work is progressing, and that the achievements are approaching any goals or targets that are set.

This document will be updated throughout every six months, with an interactive, updated version is available on the eSafety Support website, in the section eSafety Activities Database.

1.2 How to read this progress report

One or more indicators are defined per each Recommendation, in order to measure their progress. The indicators focus on the main actions and milestones to be achieved.

After the measurement of the progress based on the indicators, an analysis of the progress is given aiming to identify the criticalities and the bottlenecks for each topic. A colour code criteria has been introduced to focus on the progress of the Recommendation. Table 1 summarises the colour criteria used in this report.

Table 1 - Colour code summarising the progress of the Recommendation

Colour	Symbol	
Green		The Recommendation has been fulfilled/nearly fulfilled and there are no deviations from the expected progress.

Yellow		The recommendation has not been fulfilled or some deviations from the expected progress are present, due to some bottlenecks. Further actions are needed to insure a smooth progress.
Red		The recommendation is far from being fulfilled or there are some important deviations that risk jeopardising its fulfilment. Special attention should be given to undertake actions to bring the progress back on track.

1.3 Intended audience

This document targets all eSafety stakeholders.

Chapter 2 - PROGRESS OF THE 28 RECOMMENDATIONS

2.1 List of recommendations

The final report of the eSafety Working Group from November 2002 lists 28 recommendations for further actions within the following eSafety related topics:

- **Accident Causation Data**
- **Impact assessment of safety systems**
- **Human-Machine Interaction**
- **Road Map for Intelligent Integrated Safety**
- **Intelligent Passive Safety Systems**
- **Intelligent Integrated Road Safety Systems including ADAS**
- **The European Safety Map database**
- **Emergency Calls (e-Calls) and E-112**[1]
- **Real-time Traffic and Traveller Information (RTTI) for road safety**
- **Motor vehicle type-approval legislation**
- **Safety systems standards and regulation in the EU: State of the art**
- **Legal issues of market introduction of Intelligent Integrated Road Safety Systems**
- **Ultra wide-band 24 GHz short range radar**[2]
- **Societal aspects**
- **The different business cases**
- **User Outreach**
- **The eSafety Forum**

This progress report describes one or more indicators for each of the 28 recommendations, try to measure and analyse the progress, and outlines national and European eSafety activities contributing to the fulfilment of the recommendations.

2.2 Summary Progress of the 28 recommendations

Based on the colour code explained in section 2.1, the current status of progress of the aforementioned recommendations is synoptically summarised in table 2.

[1] Recommendation 14 on eCall was updated by Dr. Wolfgang Reinhardt, ex co-chair of the eCall DG, to reflect the updated priorities and roll-up plan for eCall.
[2] Under the request of the European Commission, Recommendation 21 and 22 have been updated by Dr Gerhard Rollman (SARA Group) to keep track of the renewed challenges of the eSafety initiative for this topic.

The following sections of Chapter 2 analyses in detail the progress of each recommendation based on a set of indicators defined per each of them (the complete list of indicators is available in Appendix A).

Chapter 3 summarises the conclusions of the analysis of the progress, identifying the criticalities and the bottlenecks for each topic. At the time being this progress report is the last one to be produced by eSafety Support and on further updates will be done by this project.

Table 2 - Colour code summarising the progress of the Recommendation

3) Impact assessment of safety systems Methodology **4) Set up coordinated FOTs** **8) Determine clear goals and priorities for further RTD** **23) Societal aspects: estimate the socio-economic benefits** **28) The eSafety Forum**	
1,2) Accident Causation Data **5,6) Human-Machine Interaction** **7a,b) Road Map for Intelligent Integrated Safety** **9) Interfaces and communications protocols for V2V, V2I** **10) Pursue International Cooperation** **11) The European Safety Map database** **12, 13, 14) Emergency Calls (e-Calls) and E-112[3]** **15, 16, 17) Real-time Traffic and Traveller Information (RTTI)** **18) Motor vehicle type-approval legislation** **19) Safety systems standards and regulation in the EU** **20) Legal issues of market introduction of IIRSS** **27) User Outreach**	
21,22) Ultra wide-band 24 GHz short range radar[4] **24) Societal aspects: incentives** **25,26) The different business cases**	

[3] Recommendation 14 on eCall was updated by Dr. Wolfgang Reinhardt, ex co-chair of the eCall DG, to reflect the updated priorities and roll-up plan for eCall.
[4] Under the request of the European Commission, Recommendation 21 and 22 have been updated by Dr Gerhard Rollman (SARA Group) to keep track of the renewed challenges of the eSafety initiative for this topic.

2.2.1 Accident Causation Data

Recommendation number and title

1) Consolidate analyses from existing EU, Member State and industry road accident data.

2) Develop jointly a European Accident Causation Database covering all EU countries, and facilitate access to it.

Activity leader

European Commission

Introduction

Today in the EU, there are different sources of accident statistics and accident databases from the Member States, but no single consolidated accident causation database exists. A clearer picture of accident causation is needed on a pan-European basis to enable effective safety investment decisions to be made on a sound scientific foundation.

The aim of these Recommendations is to ensure that actions are taken in order to establish a European network for accident analysis. This provides a more scientific basis for the identification and evaluation of effective safety functions, enables the confirmation of the most-suitable tests and procedures for safety, performance, and ease of use, as well as enables the evaluation of effective countermeasures.

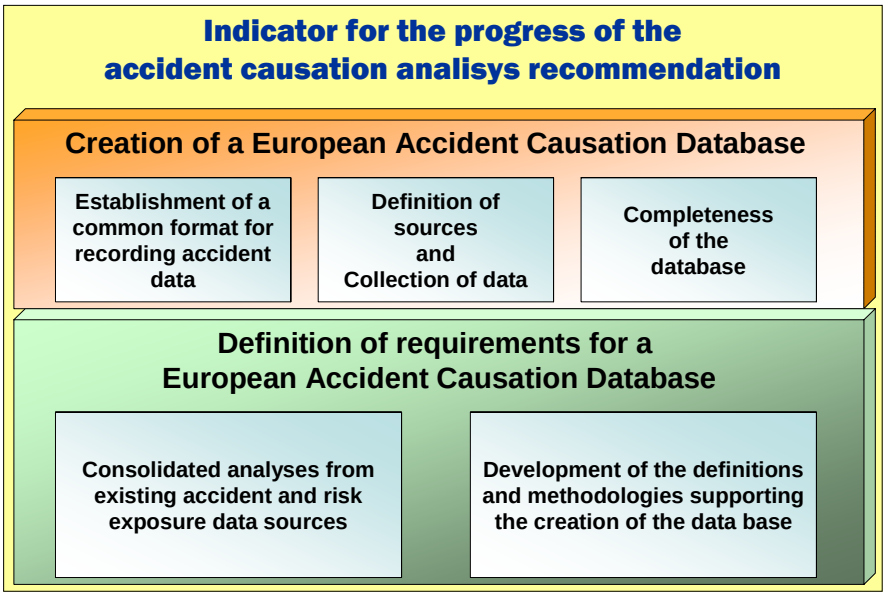

Figure 1 - Breakdown of the indicator for the progress of the Accident causation analysis Recommendations

To measure the progress of these Recommendations, one indicator measures the development of the definition of requirements for a European Accident Causation Database, while the other synthesises the progress of activities aiming at realising the database. Figure 1 shows the breakdown of the indicators.

Indicators of progress of the Recommendations

1.1) Consolidated analyses from existing accident and risk exposure data sources	The Accident Causation Analysis Working Group carried out a first analysis of existing data sources, strongly recommending that the task of interrogation of the existing data sources be included in a funded project in the following year. Following this recommendation, the EC funded the TRACE project that is expected to offer an overview of the road accident causation issues in Europe based on local and national databases. TRACE has started delivering reports on accident causation factors analysis and methodologies since June 2007. Emphasis was given to hypothesis-generating methods as well as developing methods for testing hypotheses on risk factors. This work is based both on literature review and database analysis. Full reports on the results of accident causation analysis and safety benefits of technologies were delivered in June 2008.
1.2) Development of the definitions and methodologies supporting the creation of the data base	The EU-funded SafetyNet project (The European Road Safety Observatory) is developing homogeneous accident data collection protocols in several EU countries and creating an injury and fatal accident database. In August 2007, TRACE made public the reports developed on methods to overcome typical accident and exposure data quality problems, available for download on the TRACE website.
2.1) Establishment of a common format for recording accident data	SafetyNet is developing homogeneous accident data collection protocols in several EU countries.
2.2) Definition of sources and collection of data	SafetyNet is creating an injury and fatal accident database. This database will represent a homogeneous source to collect data.
2.3) Completeness of the accident causation database	No accident causation database at European level has been created up to now.

Analysis of the progress

	The deployment of an accident-causation database is a cornerstone for the eSafety initiative, since a scientific base in needed to determine the main causes of fatal accidents. Based on this information, an impact assessment of the eSafety systems can be conducted, selecting the most appropriate ones to achieve the objective of halving the number of fatalities. However, the indicators above show that even if the progress of the necessary steps for the creation of the database are slowly progressing, with two main projects delivering their results by the end of 2008, its finalisation is still not imminent, since at the moment there are no planned project working on the results and progress already made through SafetyNet and TRACE to continue the work of creating a European accident causation database.

Report on the progress of accident causation analysis recommendations

Current Status

Although former accident causation and impact assessment research produced a tremendous amount of knowledge and there are different sources of accident statistics from the Member States, the exact nature of ICT's contribution to road safety cannot be determined. This is due to the fact that consistent EU-wide accident causation analysis has been unavailable and no single consolidated accident causation database exists.

Information on national and international data was analysed by different eSafety Forum Working Groups (WGs). However, the comparison of data is difficult and several of the WGs are investigating how to best make use of this data.

The Implementation Road Maps WG has compiled some of the results in order to list technologies according to the impact on road safety in Europe. The Accident Causation Data WG analysed available European data sources and produced its final report, including recommendations for further actions, in December 2004

To try to overcome these problems in the short term, the Accident Causation Analysis WG has examined available European data sources including CARE, MAIDS, GIDAS, EACS, CCIS, OTS, and IRTAD. These sources contain general accident statistics and/or in-depth details and range from European to national and private institution level. All sources contain useful data, so one of the first tasks has been to see how these heterogeneous sources could be better used to yield a more consistent European picture that would provide a usable safety diagnosis to enable impact assessment and thereby identify priorities for action.

The above analysis resulted in the clear identification of the need for resources to carry out this interrogation. This was taken into consideration in appropriate call of FP6, when the Commission has expressed two different directions regarding accident analysis. One of these regarded "research in consistent accident causation analysis to gain a detailed knowledge about the real background of European traffic accidents using existing data sources" (Strategic Objectives 2005-2006:2.4.12: eSafety-Co-operative systems for road Transport). This objective and the corresponding call led to the creation of the TRACE project (TRaffic Accident Causation in Europe).

The general objective of TRACE was to give an overview of the road accident causation issues in Europe, and possibly overseas. In order to achieve this, the project makes an analytical overview (contents, quality, consistency, pertinence, applicability, representativity) of current safety databases available in Europe (accident databases, exposure databases, driver behaviour databases, insurance, medical databases etc.) and selects those which are accessible, high-quality rated and relevant for the analysis. This step is followed by a systematic and comprehensive literature review of methodologies in accident analysis. Based on the data and knowledge of the previous two stages, the project sets an up-to date descriptive diagnosis of the accident causation issues, in the countries where the data is available and also tries to extrapolate the information to EU25. The idea is to identify, characterise and quantify the nature of risk factors, groups at risk, specific conflict driving situations and accident situations; and to estimate the safety benefits of a selection of technology-based safety functions

TRACE was also intended to participate in the efforts to develop and improve methodologies related to accident causation, in particular in the area of data analysis. Special care and attention is brought to methodologies which enable the linking of different databases and methodologies which make it possible to combine clinical analysis (micro-accidentology) and statistical analysis (macro-accidentology) into a predicted meso-accidentological analysis, combining in-depth accident analysis and accident epidemiology. The project's work will contribute through the developed methodology and analysis to the assessment of whether the existing technologies or the technologies under development address the real needs of road users inferred from accident causation and driver behaviour analysis.

TRACE proposed three different research angles for the definition of accident causation and the quantification of the risk factors. These three angles are: the road user approach, the types of situation approach and types of factors approach, which are expected to produce complementary results that are able to offer a broader understanding of accident causation. An important trait of the project is the adoption of a sociological and socio-psychological approach, aimed to analyze the relevance of different socio-cultural frameworks for accident causation factors. In this framework, issues such as gender and age are being addressed, as well as contextual issues like education. From this perspective, a special emphasis is given to the notion of risk form a socio-cultural point of view.

As a whole, TRACE intended to take a picture of the accident causation problems on European roads by combining explicitly in-depth accident analysis, road epidemiology and human factors analysis.

The main challenge for TRACE was probably the fact that it relies on existing data and that the definition of the causes of accidents is complex. The statistics remained hard to collect and sometimes hard to interpret.

The project estimates that the combination of a fleet fulfilling the five star EuroNCap standards, integrating the ESC (Electronic stability control) and the EBR (Emergency Breaking) would imply a reduction of 70% of fatalities. The most promising systems, according to the studies, appear to be the Intelligent Speed Adaptation, the Automatic Breaking System and the Crash avoidance & warning.

Some of the challenges still to be faced include the evaluation of the most promising safety applications, the methodology used in terms of human factors analysis and the fact that each country still has a different definition of the variety of accidents and exposure to risk database.

The large-scale EU-funded project SafetyNet (The European Road Safety Observatory) is developing homogeneous accident data collection protocols in several EU countries, constituting an injury and fatal accident database. However, SafetyNet does not aim to identify relevant methodologies to evaluate the effectiveness and efficiency of technology-based safety systems.

The studies and reports developed on the subject are many and the completeness of the elements taken into account is nearly exhaustive.

Contacts:
Mr Yves Page, TRACE project yves.page@lab-france.com

2.2.2 Impact assessment of safety systems

Recommendation number and title

3) Develop a methodology to assess the potential impact of intelligent integrated road safety technologies in Europe. Develop a validation methodology and procedures for vehicles equipped with intelligent integrated road safety systems.

Activity leader

Automotive industry

Introduction

This Recommendation follows on the previous two, coping with the analysis of the accident causation data to be used for defining the most effective countermeasures. The impact can be assessed with either an accident causation or behavioural effects approach.

The Recommendations also cope with reliability aspects of IVSS, aiming at developing an independent testing methodology to assess the performance of the ICT-based safety systems – comparable to existing type approval tests or additional tests (e.g. crash tests) assessing passive safety performance of vehicles.

Therefore to measure the progress of this Recommendation, two indicators are proposed: one for impact assessment methodology and the other for the validation methodology. Figure 2 shows the breakdown of the indicator.

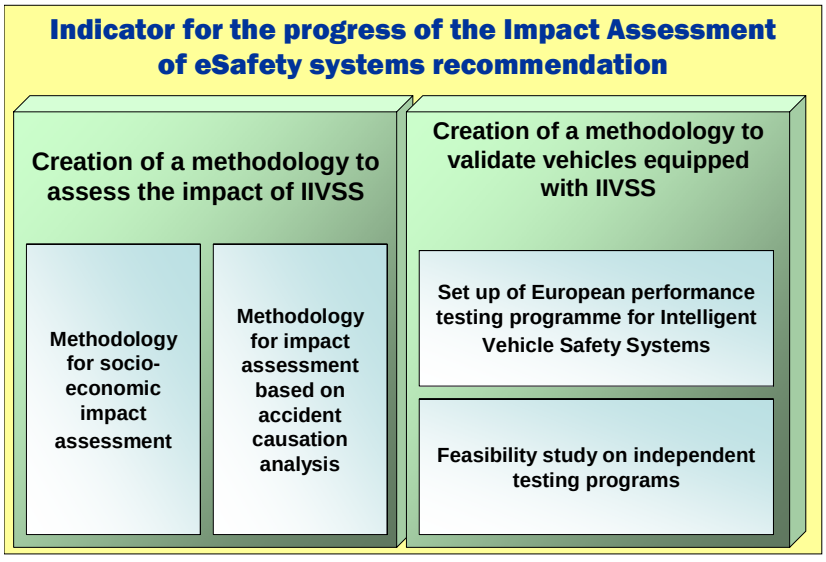

Figure 2 - Breakdown of the indicator for the progress of the impact assessment of eSafety systems recommendation

Indicators of progress of the recommendations

3.1) Creation of a methodology to assess the impact of IVSS	Identification of the most promising IVSS technologies by the Implementation Road Maps Working Group and creation of a database for the collection of safety and other effects of intelligent vehicle safety systems. Exploratory study on the potential socio-economic impact of the introduction of Intelligent Safety Systems in Road Vehicles (SEiSS project) in 2005. The eIMPACT project is aiming at assessing the socio-economic impact of IVSS, including a picture of the costs and benefits for the stakeholders and the macroeconomic effects. The methodology has been developed for the assessment of the safety and traffic effects as well as the socio-economic feasibility of IVSS. Results were recently made available on the traffic impacts of IVSS, as well as on a traffic micro-simulation model and driving simulation tests for wireless local danger warning. The final results of the project were made available in June 2008. A specific study on the impacts of cooperative systems will utilise and also verify the methodologies as developed in eIMPACT in 2008. TRACE project developed, among others, statistical methodologies for safety impact assessment. The PreVENT subproject PReVAL evaluated the safety and other impacts of the systems or functions as developed in the many subprojects of PreVENT but not covered by eIMPACT.
3.2) Creation of a methodology to validate vehicles equipped with IVSS	In 2006, the European Commission launched a feasibility study on independent testing programmes for ICT-based safety systems called ASTE (Active Safety Testing in Europe). The aim was to assess the technical and economic feasibility of setting up an independent performance and conformance testing programme for Intelligent Vehicle Safety Systems in the EU, to define the necessary methods and principles, and to evaluate if consensus on the proposed principle can be achieved with different stakeholders. The study has concluded in favour of a harmonised testing programme, stating that performance testing is technically and economically feasible, and performance testing shall be developed to test the performance of a safety function in a traffic scenario, not to verify fixed requirements on individual technical systems. To this extent, consensus between different stakeholders can be achieved, but this requires lot of efforts to gain a common platform.

Analysis of the progress

	Several projects have produced different methodologies for the impact assessment of IVSS (SEiSS, eIMPACT, TRACE, PReVAL; eIMPACT uses and extends the SEiSS methodology; PReVAL and eIMACT use the same safety impact assessment methodology). The application of these methodologies to the different systems will allow the consolidation of a list of priority systems and policy development at European and national levels. The ASTE feasibility study concluded that performance testing is economically and technically feasible. The next step is for suppliers to agree on standardised test methods. More research must also be done on driver behaviour and driver modelling. Other requirements include the development of performance testing methods, and consensus on how performance testing should be encouraged, managed and controlled.

Report on the progress of impact assessment of eSafety systems recommendations

Current Status of the methodology to assess the impact of IVSS

The work on a methodology to assess the safety impact of eSafety systems started within the Implementation Road Maps WG, which collected information about the safety impacts of ITS systems from various sources (literature, German and Swedish accident causation data, data analysis of the European CARE accident data base). In close liaison with the Implementation Road Maps WG, eSafety Support has developed a database (http://www.esafety-effects-database.org) on the safety and other effects of intelligent vehicle safety systems that was launched in the summer of 2006 and is being updated on a regular basis with new research results.

An exploratory study on the potential socio-economic impact of the introduction of Intelligent Safety Systems in Road Vehicles (SEiSS project) was completed in January 2005. The socio-economic impact was preliminarily estimated for a certain number of cases showing a positive cost-benefit ratio in the long term. The project provided a survey of current approaches to assess the impact of new safety functions, developed a methodology to assess the potential impact of intelligent safety systems in Europe, provided factors for estimating the socio-economic benefits resulting from the application of intelligent road safety systems. (These factors, such as improved journey times, reduced congestion, infrastructure and operating costs, environmental impacts, medical care costs etc., will be the basis for a monetary assessment, and in the development of a framework for exploring market deployment scenarios.)

The socio-economic impact assessment methodology developed in the SEiSS project was then extended in the eIMPACT project that started in 2006 to address stakeholder-specific issues. All other work packages and tasks are defined in relation to the socio-economic impact assessment. Key activities include: the identification of the most promising stand-alone and co-operative IVSS technologies, the development of scenarios for IVSS for the years 2010 and 2020, the impact of IVSS traffic safety and efficiency in these scenarios, and the identification of policies to enable the implementation of IVSS.

The output of eIMPACT was an assessment of the socio-economic impact including a picture of the costs and benefits for the stakeholders and the macroeconomic effects, which will contribute directly to policy development at European and national levels. The work started with the development of the methodologies required by the different aspects of socio-economic assessment for the parts not covered in sufficient detail by SEiSS. Results were recently made available on the traffic impacts of IVSS, and a traffic micro-simulation model results and driving simulation tests for wireless local danger warning. In 2008, the safety effect estimates for the twelve selected IVSS were be published.

From an accident-causation perspective, the Accident Causation Analysis WG has examined available European data sources including CARE, MAIDS, GIDAS, EACS, CCIS, OTS, IRTAD. These sources contain general accident statistics and/or in-depth details and range from European to national and private level. All sources contain useful data, so one of the first tasks has been to see how these heterogeneous sources could be better used to yield a more consistent European picture that would provide a usable safety diagnosis to enable impact assessment and thereby identify priorities for action. The TRACE project develops, among others, statistical methodologies for safety impact assessment. TRACE is intended to participate in the efforts to develop and improve methodologies related to accident causation, in particular in the area of data analysis. Special care and attention is brought to methodologies which enable the linking of different databases. As a whole, TRACE intends to take a picture of the accident causation problems on European roads by combining explicitly in-depth accident analysis, road epidemiology and human factors analysis.

In addition, PReVAL evaluates the potential of the functions and systems developed in the PReVENT subprojects with regard to the HMI results - user acceptance, preferences and behaviour, and estimates the potential safety impacts of the PReVENT functions not covered by eIMPACT. PReVAL utilises the methodologies developed in eIMPACT.

Current Status of the methodology to validate vehicles equipped with IIVSS

Even though IVSS systems have shown great potential for reduction of accidents and fatalities, few of them are currently commercially available. Among the various reasons for slow deployment are issues related to reliability and liability. While current legislation doesn't define the requirements these systems must fulfil, standards have to be agreed on to facilitate their market introduction. Therefore, an independent testing methodology to assess the performance of the ICT-based safety systems is needed – comparable to existing type approval tests or additional tests (e.g. crash tests) assessing passive safety performance of vehicles.

The main area of concern within the current type-approval system and additional passive safety performance tests is to ensure that the construction of the vehicle is capable of providing acceptable levels of safety, mainly to vehicle occupants but also to other road users. Similar procedures should be developed for IVSS, which are used to avoid accidents, mitigate the effects in case of an accident and assist in recovery following an accident. The challenge for performance testing is that traffic situations in connection with Intelligent Vehicle Safety Systems are highly complex and involve a magnitude of variations. Therefore the traditional testing methods are not suitable for testing these systems as such.

A feasibility study on independent testing programs for ICT-based safety systems called ASTE (Active Safety Testing in Europe) was launched by the Commission in 2006 with the aim to assess the technical and economic feasibility of setting up an independent performance and conformance testing programme for Intelligent Vehicle Safety Systems in EU, to define the needed methods and principles, and to evaluate if consensus on the proposed principle can be achieved with different stakeholders.

The study has concluded in favour of a harmonised testing programme, recommending that performance testing should be developed to verify the performance of a safety function in a traffic scenario, but not to confirm fixed requirements in individual technical systems.

However, the ASTE final report recognises that a testing programme will be a complex matter, because of technical, organisational and marketing issues. It will be important to find a performance testing programme with benefits for both traffic safety and industrial development. Some conclusions may be regarded as sensitive by some stakeholders. Further discussion will be needed to strengthen the acceptance by stakeholders.

ASTE says that performance testing could be based on documentation, systems or traffic scenarios.

1. For a document-based test, an evaluation would be performed by reviewing the design, system and functional specifications supplied by the manufacturer. The advantage to this method is the low cost involved, but the disadvantage is that it is difficult to assess a system through only a theoretical review.
2. A system-based test would use a combination of practical physical tests to verify a safety system. The potential drawback is that it may limit the technical development of new safety systems since minimum requirements and definitions will depend on today's technology.
3. Scenario-based performance testing puts a vehicle in a real life accident scenario and is the favoured testing method for the ASTE partners. According to the team, the advantages to this set-up are that the test methods can be harmonised, and that the process will be suited to technical system variations and new systems. The challenge will be to define an appropriate number of normative traffic scenarios.

The costs of carrying out such tests are estimated to be in the same order as tests on the passive safety of a vehicle. The testing facilities can also be used during the development of a new system.

Once tests have been performed, the results must be communicated to consumers in a way that ensures their different requirements are met. Results should be communicated on several levels, ranging from a very detailed to a simplified level. Consumers must be able to compare results from different vehicles with ease.

The next step is for suppliers to agree on standardised test methods. More research must also be done on driver behaviour and driver modelling. Other requirements include the development of performance testing methods, and consensus on how performance testing should be encouraged, managed and controlled.

Contacts:
Prof Risto Kulmala, VTT, risto.kulmala@vtt.fi

Recommendation number and title

4) Set up a coordinated validation framework for operational tests in the Member States.

Activity leader

European Commission, Industry

Introduction

This Recommendation addresses the necessity of starting large-scale test programmes (FOTs) aiming at a comprehensive assessment of the efficiency, quality, robustness and user-friendliness of ICT solutions for smarter, safer and cleaner vehicles and real-time network management. The expected impact will be to demonstrate, analyse and provide proof-of-concept to all stakeholders of the impact of intelligent vehicle systems and co-operative systems on the reduction of traffic accidents, on driver behaviour and on transport efficiency.

Therefore, to measure the progress of this recommendation, two indicators are proposed: one taking into account the methodological aspect of the tests and the other which tracks the tests actually underway. Figure 3 shows the breakdown of the indicator.

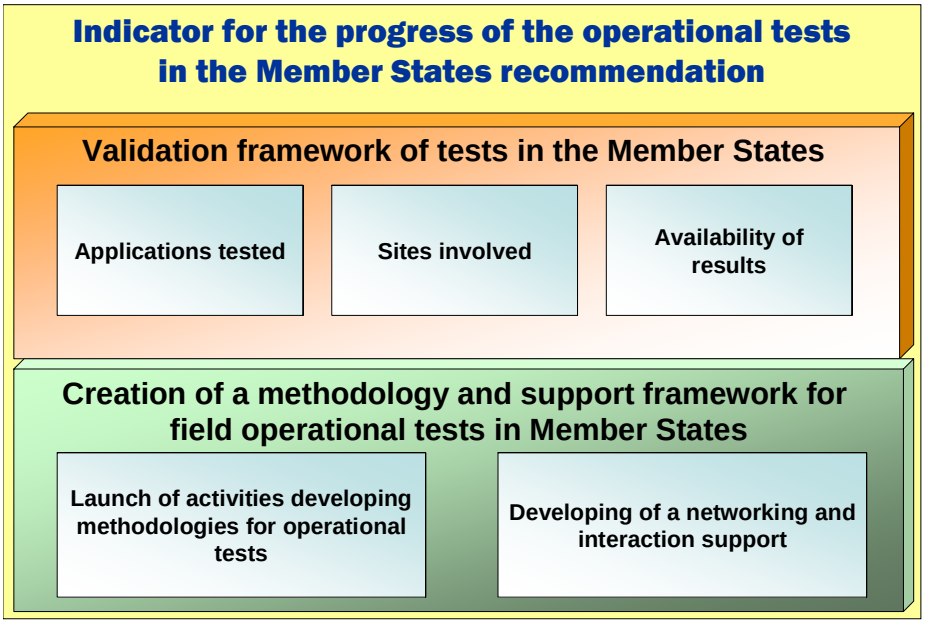

Figure 3 – Breakdown of the indicator for the progress of the operational tests Recommendation

Indicators of progress of the recommendations

4.1) Creation of a methodology for operational tests in the Member States	As part of the "phase 1" plans for the EC FOTs activities, the project FESTA, funded under Call 1 of FP7, has established an agreed structure, organisation, and assessment methodology of field operational tests in Europe. The project has delivered the FOT handbook which is now guiding the design and implementation of all future tests to be launched on technically mature ICT-based systems, covering technical aspects, user acceptance, efficiency and deployment aspects. The use of the handbook will, in particular, provide the confidence that FOT results on overall benefits are scientifically robust, in terms of both measured results and cost/benefit analysis. It will also give guidance on the format and type of behavioural measures to be considered when designing an FOT. In the field of ADAS, the euroFOT project is especially active in tuning the existing methodologies, adding specific aspects for system specification, and promoting a shared terminology. While these methodologies for ADAS can make use of other FOT experiences, FOT methodologies for nomadic devices and cooperative systems have not been fully tested yet. TeleFOT has announced that they would contribute to improve the methodology for FOTs on nomadic devices. In addition, Pre-Drive C2X project will use some resources to tune the FOT methodology to the specificity of cooperative systems. The FOT-NET support action is now promoting the use of the FOT handbook through a series of seminars organised by TNO and University of Leeds. The seminars are done in tight collaboration with the existing European FOT (EuroFOT and TeleFOT) but also aim to reach out to all other national FOT activities. Even though FOT-NET does not aim to update the FOT methodology, the support action is gathering inputs from all stakeholders for improvement of the methodology. FOT-NET has also initiated international cooperation with US and Japan to identify how much best practices and methodology should be harmonised.
4.2) Field Operational Tests in the Member States	Several field operational tests have already been deployed in Europe in previous R&D programmes and at national level e.g. France, Germany, Italy, the Netherlands, Sweden, UK (for further details see the section reporting on the progress below). However, none of these tests were led in a European coordinated framework and inter-operability among Member States was not a priority. The EC is funding a platform (FOT-NET) to coordinate different national and European tests where the participants can build a strong knowledge base and experience through networking

	and concertation. It also networks with the international FOTs such as in Japan (SMARTWAY, Sky Project, Starwings, ITS-Safety 2010) and USA (IVBSS, CICAS, IVI, VII). FOT-NET held an international workshop in New York in November and will meet up with the Japanese delegation in the beginning of 2009. The international workshop should reconvene in Stockholm in September 2009. At European level, significant large scale FOTs activities have been launched in the summer 2008. In particular, two FOTs are funded by the EC in this "phase 2": EUROFOT and TELEFOT. The EUROFOT IP aims to assess the impact of advanced driver assistance and preventive safety functions in real traffic conditions. Eight major functions are investigated: Forward Collision Warning, Adaptive Cruise Control, Speed Regulation System; Blind Spot Information , Lane Departure Warning, Impairment Warning, Curve Speed Warning, Fuel Efficiency Advisor and Safe Human Machine Interaction. The tests involve 1500 vehicles, both passenger cars and trucks, from 11 European car manufacturers. The practical operation of FOTs is performed through Vehicle Management Centres (VMCs), representing different countries in Europe. By this coordinated approach across several areas in Europe, the expected results will include relevant indications that could encourage strategic decisions by different stakeholders, like Public Authorities, OEMs, Suppliers, and User Groups The TELEFOT IP, which will run for four years and involve 3000 drivers, will address problems of safe fixing and use of nomadic and after-market devices in vehicles. Functions being tested cover three broad areas: promotion of safe driving; economic driving; and a novel navigator-retrofitted eCall emergency alert system. FOTs will assess their impact on the efficiency of the transport system, usability, driver behaviour and accident causation, safety and the environment. The main emphasis of the work is on speed and traffic information, road weather information and 'green driving' support. While the EC-funded FOT activities are very active in 2008, the members states have also been active. Among others, The Netherlands with a series of pilots and FOTs among them an FOT with 3000 trucks (AOS); Sweden has been very active with a fruitful cooperation with University of Michigan (SemiFOT) and other plans; Germany has launched two national funded activities: AKTIV which includes some field tests for the validation part of the project and Sim-TD a cooperative systems FOT collaborating with and using results of Pre-Drive C2X. Other initiatives are still on hold: the French Voltaire has not received the expected national funding and the Spanish eSafety is struggling with the change of government for its eCall national wide test.

Analysis of the progress

	Field operational tests (FOTs) are a strong priority for this phase of the eSafety initiative. Even if a number of tests have been already launched, there is the need of a European-wide impact assessment of all mature systems to ensure their wider take-up. The structure, organisation and assessment methodology indicated by FESTA are now used by all the relevant EC-funded FOTs and some national ones. . The methodology should be adopted by all stakeholders to ensure comparable data across different FOT activities and to bring improvements from field experience. Extensive support is still needed to promote, or even force, the use of the European FOT methodology in the different FOTs. The EC should encourage that all planned activities provide a feedback with their lessons learned from the execution of their FOTs to the FOT-NET support action. Also, FOT-NET should promote FOTs and its methodology at national level in order to encourage national FOT initiatives. With comparable data, the national results should be used as a complementary "local" information to the EC results. Besides the two EC-funded FOT activities and the support action, the national FOT activities of the Members States are still not fully coordinated. Even if a full control is not necessary, the EC should reinforce the link between European and member states activities and encourage more "EC-coordinated" local public investments for large scale national testing facilities such as region-wide test sites with all the local involvement necessary to run it.

Report on the progress of field operational test recommendation

Current Status

So far, demonstrations have been used to test the technical and functional behaviour of eSafety systems, but they have always been restricted and limited in scale. What is needed is analysis and assessment in a real environment with everyday drivers for a period of time that allows for the collection and processing of data in a statistically sound way. This is the idea of the Field Operational Tests (FOTs).

Work on FOTs is one of the priorities of FP7, that is, the launch of large-scale test programmes aiming at a comprehensive assessment of the efficiency, quality, robustness and user-friendliness of ICT-based solutions for smarter, safer and cleaner vehicles and real-time network management. As far as FOTs are concerned, Call 1, which closed in the first half of 2007, aims at ramping up the FOTs with the methodological and organisational aspects of the test. Call 2 aims at launching large scale test programmes (FOTs) which includes a comprehensive assessment of the efficiency, quality, robustness and user-friendliness of IT solutions for smarter, safer and cleaner vehicles and real-time traffic management. The objectives of the FOTs to be launched in FP7 are to:

1. Validate the effectiveness of ICT-based systems for safer, cleaner and more efficient transport in a real environment;
2. Analyse driver behaviour and user acceptance;
3. Analyse and assess the impact of intelligent safety and efficiency functions using real data;
4. Improve awareness on the potential of intelligent transport systems and create socio-economic acceptance;
5. Obtain technical data for system design and product development
6. Ensure the transferability of the FOT results at the national, European and international level.

In order to collect data that will allow statistical value and scientifically sound conclusions, FOTs should be carried out at the European level with the necessary fleet of vehicles and infrastructure, appropriate number of drivers and for a sufficient amount of time.

Phase 1: Ramping up.

This phase has defined the basis for designing, running and evaluating FOTs at European level. It started, in FP7 Call 1, with the selection and funding of a support action, called FESTA, which analysed the structure, organisational issues, running conditions and assessment methodologies of FOTs in Europe. The FESTA project, active from November 2007 to May 2008, was aiming at producing a shared methodological framework to perform FOTs. The handbook, main output of the FESTA project, is now used as a reference by all actors involved in future FOTs.

This European FOT Methodology Handbook is a practical guide for the design and implementation of large-scale tests. It considers the whole lifecycle of a FOT, from the analysis of stakeholders needs, the choice of behavioural and other indicators (performance and individual), the methods by which they are measured, (data acquisition) and analysed, reported and integrated, and legal, ethical and procedural considerations.

In addition, an extensive range of ICT-based solutions have been considered with three major areas of interest: vehicle systems, cooperative systems and nomadic devices. The methodology for cooperative systems and nomadic devices is being improved by the respective activities working on these topics.

The handbook produced by FESTA is now promoted be the FOT-NET support action through a series of seminars for EC and national FOT activities.

Phase 2: Large-scale FOTs.

Two large scale FOTs are focussing on mature technologies and systems resulting from previous EC-funded projects, or cover issues that are critical for market implementation. The EC is funding two integrated projects under the FP7 Call 2: EUROFOT and TELEFOT.

The EUROFOT IP assesses the impact of advanced driver assistance (ADAS) and preventive safety functions in real traffic conditions. Eight major functions are investigated: Forward Collision Warning, Adaptive Cruise Control, Speed Regulation System; Blind Spot Information , Lane Departure Warning, Impairment Warning, Curve Speed Warning, Fuel Efficiency Advisor and Safe Human Machine Interaction. The tests involve 1500 vehicles, both passenger cars and trucks, from 11 European car manufacturers. The practical operation of FOTs is performed through Vehicle Management Centres (VMCs), representing different countries in Europe. By this coordinated approach across several areas in Europe, the expected results will include relevant indications that could encourage strategic decisions by different stakeholders, like Public Authorities, OEMs, Suppliers, and User Groups

The TELEFOT IP, which runs for four years and involves up to 3000 drivers, will address problems of safe fixing and use of nomadic and after-market devices in vehicles. Functions being tested cover three broad areas: promotion of safe driving; economic driving; and a novel navigator-retrofitted eCall emergency alert system. The FOTs will assess impact of functions on the efficiency of the transport system, usability, driver behaviour and accident causation, safety and the environment. The main emphasis of the work is on speed and traffic information, road weather information and 'green driving' support.

The EC has also selected for funding a support action. The two year FOT-NET project has created a structure to support FOTs, with a view to networking European FOTs with national initiatives and projects ongoing in other world regions, and helping the EC to achieve an integrated approach to FOTs.

They have established a networking platform, representing all public- and private-sector stakeholders; promoting adoption of FESTA results and a common methodology; creation of an FOT-portal to increase visibility of FOT activities; and, finally, disseminating FOT results among the general public to increase awareness of the potential of ITS.

Phase 3: Future calls.

This will build on the experience of the first two phases. Future FP7 calls are expected to cover further work on cooperative systems for safer and more efficient transport systems, which started as a result of FP6 Call 4. The project Pre-Drive C2X is preparing the basis for this FOT on cooperative systems.

An FOT-based 'naturalistic driving' study to investigate accident causation could also be funded by the EC during this phase and the issue of preventive safety and driver assistance will also continue to be covered, addressing more specific problem areas eg intersection safety or protection for pedestrians and other vulnerable road users.

FOTs are not a new activity for EU Member States, as many have already conducted demonstration and FOTs activities within their national research programmes.

Sweden

Regarding ISA (Intelligent Speed Adaptation), the Swedish experiment is probably the most significant, by virtue of the number of cities and equipped vehicles. The city of Umeå had no less than 4000 vehicles that were fitted with an informative system. In the cities of Lidköping, Borlänge and Lund, there were about 4000 vehicles fitted with informative and/or active ISA.

The IVSS Programme, set up to stimulate research and development for the road safety of the future, will run until the end of 2010. The end-result will probably be new, smart technologies and new IT systems which will help reduce the number of traffic-related fatalities and serious injuries. Key areas are active safety, preventive solutions and further development of the road holding and crash safety characteristics of cars and commercial vehicles. Another focus area is the development of intelligent vehicle and road infrastructure systems, which includes systems that can improve safety for unprotected road users. Some of the technical solutions are still on the drawing board, while others are closer to the production stage. Because the IVSS Programme acts as a forum for new ideas and the technology of the future, the most innovative solutions are probably still to come.

Regarding FOTs, SAFER is leading a national initiative with close cooperation of road authorities, automotive industry and research institutes.

Italy

The Italian Ministry of Transport is promoting the development of pilot applications to test and validate the feasibility and the effectiveness of the technical/organisational schemes defined by Italy's national ITS architecture. Priority areas for pilot applications include multimodal transport of hazardous goods, integrated management of emergency calls, and goods distribution in urban areas.

Finland

VTT is aiming at creating a test community of vehicle drivers to assess the long term impacts of selected safety functions provided by means of mobile after-market devices and raise wide awareness of the utilities driver assistance functions have in daily travel (TELEFOT).

France

The most relevant FOT carried out in France was LAVIA (2002 – 2006). This ISA trial was conducted on a significant scale (20 vehicles) and placed volunteer drivers in a real situation to provide valid results to assess system ergonomic, user acceptance and influence on driving behaviours. This trial was organised in two phases:

- Pre-evaluation phase using two prototypes and ten drivers
- In-traffic evaluation phase using twenty vehicles and involving a hundred drivers who each used a LAVIA-equipped car for eight weeks. They used this vehicle instead of their usual car for daily trips (both work-related and leisure).

The Netherlands

In the Netherlands, several national FOTs concerning intelligent vehicles have been undertaken since 1998. An overview of several Dutch FOTs is below:

Past Demos and FOTs in the Netherlands	Summary of key results
Demo '98 (up to autonomous driving) (1998)	Enthusiasm about technology possibilities
ISA set external speed assistant experiment Tilburg (1999-2000)	Good acceptance, indications for better safety
LDWA Truck FOT (2002-2003)	High acceptance, less accidents and less traffic jams
Laboratory Truck FOT "**Chauffeur Assistant**"; ACC and LDWA (2004)	No negative traffic impacts, workload decreases
Fully automated in PT; Parkshuttle, **Phileas** (2001-present)	Dutch public transport users have no problem using a fully automated PT system as daily link between metro station and business park.
Floating Car Data; region Noord Brabant (2005)	Extension of gathering & dissemination traffic information by use of mobile phone GPS system possible.
Roadwise; in car speed info (2005)	Positive expectations, better use of the road capacity
Belonitor; awarding good behaviour (2005)	Positive road users, exp. less accidents and less traffic jams, more efficient fuel use
Assisted Driver passenger cars (ACC +	Positive road users, less accidents, more

LDWA) (2005-2006)	efficient fuel use and less pollution

Within EC-funded RTD programmes, CVIS and SAFESPOT project FOTs are planned in the Netherlands and Belgium (2006-2010).

The FOTs have mainly shown positive societal results. There have been several experiments with autonomous systems, but the Netherlands aims to put an emphasis on cooperative systems, because this is where the Dutch Road Authority finds one of its core businesses: better traffic management.

Germany

The German experience in FOTs can be clustered in three phases:

1. In the last 10 years (1997 - 2005), several research projects were carried out mainly dealing with the traffic management infrastructure and mobility services in German conurbations (e.g. Cologne, Munich, Frankfurt, Dresden). All the projects had a strong development part, but in all of the cases the public authorities responsible for the urban road network were involved in the projects. The operational traffic management environment of the cities was integrated in the demonstration phase of the projects. The effect was that the services used data provided by the operational systems, while the new developed services interacted with the already established services.
2. Current projects (started in the last two years) can be assigned to phase 2 (e.g. Dmotion in Düsseldorf, Aktiv). They still contain major development parts but compared with the phase 1 projects, phase 2 is characterised by a comprehensive demonstration and evaluation phase. Issues such as the long time operation of project results after completion are an integrated part of the project work. For example, the project Aktiv which deals with cooperative systems for motorways and the secondary road network, had a nine-month demonstration phase.
3. Phase 3 is currently starting. The development work in these projects will be limited because the focus is on implementation and testing of the application over a longer period (two or three years). All the applications are more or less deeply integrated in the operational systems of the involved stakeholders. In order to prepare the full operation of the applications, the projects are aiming to gather real live experience. As an example, the state of Hessen is operating an FCD fleet together with industrial partners and using the data inside the traffic management systems to operate an extended TMC services. In addition, a large Car2Car FOT is planned.

Belgium

An ISA trial carried out in 2002-2003 in Ghent was composed of 34 cars and 3 buses equipped with the "active accelerator pedal". 20 cars were voluntary users of the ISA-system (private drivers), while 14 other vehicles and 3 buses were used by companies and public administrations.

The goals of the Ghent trial were to:

- evaluate the effects of ISA on change of speed and traffic safety

- evaluate drivers' attitudes, behaviour and acceptance
- create a further carrying capacity of ISA and an acceptance of "ISA as a potential solution for road safety" by opinion and decision makers

UK

An ISA trial has also been carried out in the United Kingdom. After a first phase which essentially involved a simulator, the system was tested in Leeds with about 80 drivers and 20 vehicles.

Europe

With the support of the European Commission, European R&D projects have largely contributed to develop the state-of-the-art of ICT-based technologies and systems for mobility. FP6 Integrated Projects such as GST, PReVENT, AIDE, CVIS, SAFESPOT, and COOPERS have produced the most relevant results in terms of mature technologies with high potential impact for future FOT activities.

Contacts:
Mr Juhani Jääskeläinen, European Commission, INFSO-eSafety@ec.europa.eu

http://www.europa.eu.int/information_society/programmes/esafety/index_en.htm

2.2.3 Human-Machine Interaction

Recommendation number and title

5) Assess the reports by the Member States on the Commission Recommendation, and decide on further actions. Urgent action is needed to assess the risk of portable (nomadic) devices.

6) Develop workload assessment, testing and certification methodology for complex in-vehicle working environments.

Activity leader

5) European Commission

6) Research institutes

Introduction

Today, a wide range of Advanced Driver Assistance Systems (ADAS) is being developed for enhancing the driver's perception, interpretation and reaction in critical traffic situations and/or partly automating the driver's task in order to reduce his/her workload. The safety potential of these systems is to a great extent determined by their interaction with the driver. For example, in order to efficiently support the driver to avoid crashing into a front obstacle, it is important that the warning/feedback given by the system intuitively generates the appropriate response (e.g. a safe avoidance manoeuvre).

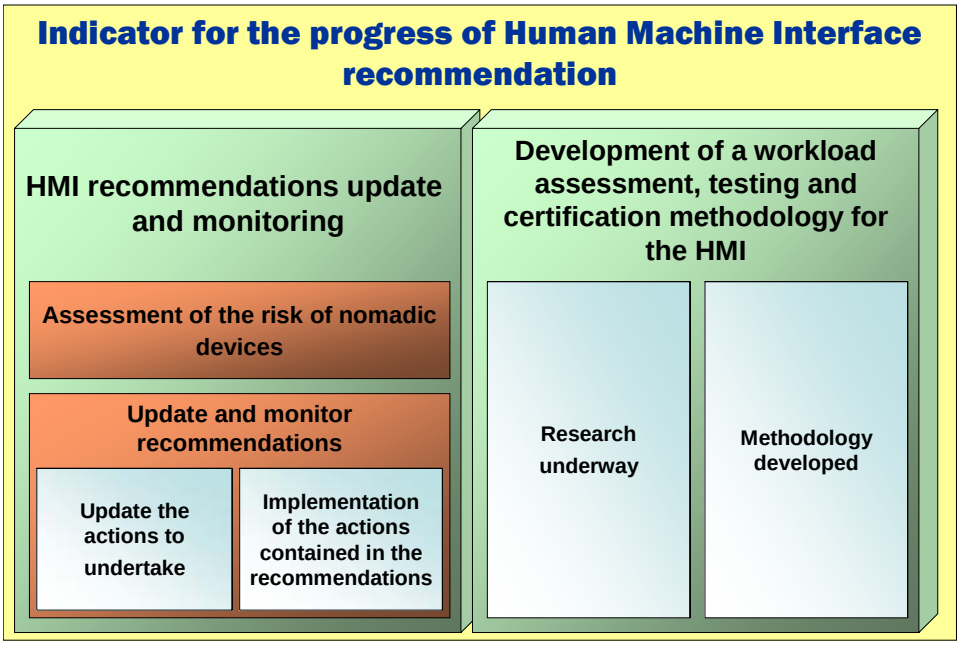

Figure 4 - Breakdown of the indicator for the progress of the HMI recommendation

The introduction of new safety functions may induce longer term changes in driver behaviour. This type of behavioural change, often referred to as behavioural adaptation, may affect the actual (as compared to the expected) safety benefits of a safety measure, both positively and negatively. In the case of Electronic Stability Control, these behavioural changes did not take place, since the safety benefit is and remains very high.

The proposed indicators will take into account two main areas while trying to measure the progress: the update of recommendations and the monitoring of their implementation, and the development of workload assessment, testing and certification methodology for complex in-vehicle working environments

Indicators of the progress of the recommendations

5.1.a) Updating of the actions to undertake to take into account the fast development in the HMI area	The "European Statement of Principles (ESoP) on HMI for in-vehicle information & communication systems" was first issued in December 1999. A revised version issued as an EC Recommendation on 22 December 2006 was intended to update and expand the original ESoP issued in December 1999 to follow the evolution of the market (portable device), and satisfy the necessity of more elaborated principles, including the answers from the Member States. The June 2007 eSafety Conference in Berlin reported that it would be "desirable that the ESoP is updated again". A further update correcting some small issues was issued on 28 July 2008. The Member states met to review ESoP progress on 30 September and asked for the eSafety HMI-WG to reconvene to consider recent experience with the ESoP and the prospects for further development. In January 2009, the eSafety WG-HMI will re-commence activities.
5.1.b) Implementation of the actions contained in the recommendations	Today, the development of Driver Assistance Systems is sufficiently addressed by existing rules, regulations and standards. ADAS which influence steering, braking and/ or the engine are specifically addressed by the RESPONSE 3 Code of Practice (CoP), facilitating introduction of safety-relevant Advanced Driver Assistance. Currently the majority of aftermarket and nomadic systems are not designed in accordance with the ESoP. All product-responsible parties need to commit to the ESoP. During 2008 the Nomadic Devices forum became an eSafety Working Group and is working towards signing a Memorandum of Understanding involving OEM and aftermarket suppliers which will commit to the ESoP. The revised ESoP asks Member States for a continuous evaluation and monitoring of the impact of the text and the

	safety in use of information and communication systems intended for use while driving - especially among manufacturers of after-market systems and nomadic devices, reporting about dissemination activities and results of applications before the end of June 2008.
5.2) Assessment of the risk of nomadic devices	The risk of nomadic devices was assessed in several research projects. However, given the continuous evolution of the HMI area, the risk assessment is an activity that must be regularly undertaken. Since the design principles laid down in the ESoP aim at minimising the risk of secondary task interaction while driving and are based on many years of experience and numerous experiments investigating the effect of HMI design parameters on driving independent on system type, it can be expected that nomadic devices designed in accordance with the ESoP do not offer a specific risk.
6) Development of a workload assessment, testing and certification methodology for the HMI	Research is underway in various European projects. Convergence on a methodology is gradually being achieved, mainly by the AIDE (developing a driver workload manager) and PREVAL projects. From these, recommendations on valid, easily applicable, and reliable procedures have become available. Moreover, these workload assessment procedures can be combined with actual driver behavior parameters to yield an overall estimate of accident risk effects (i.e., reductions) that the system will achieve. HUMANIST has proposed an overall assessment framework. Standardisation work has already been carried out in the relevant ISO standardisation group on assessing visual load and interruptability with the occlusion technique (ISO 16673 - Road vehicles — Ergonomic aspects of transport information and control systems — Occlusion method to assess visual demand due to the use of in-vehicle systems). It achieved good consensus and has been published as a full ISO standard. The possibility of a standardised "reference task" is under active consideration which could also assist reliability of assessment. Currently, another method is being standardized (Lane Change Test) that allows measuring the effect of driver distraction caused by in-vehicle information and communication systems on driving performance. Some vehicle manufacturers (E.g. Volvo, Renault) already offer systems that modify system outputs to the driver dependent on traffic situations. Since workload can not be measured directly and is actively managed by the driver while driving, it would be the most difficult parameter for certification. As the installation of displays and controls is already subject to rules and

	regulations for integrated systems in order to avoid a compromised view and passive safety, certification should equally address the aspect of installation for nomadic devices and aftermarket systems. Although some necessary components of workload assessment are being developed, a testing and certification methodology with a good scientific basis and a broad consensus has yet to be established.

Analysis of the progress

	Member States and the relevant industry actors were supposed to implement the HMI principles of the updated ESoP before December 2007. However, to our knowledge, until now the take-up is patchy at best. The automotive industry is reasonably well-informed, but often these principles are unknown to and ignored by a large part of the nomadic device industry. Thus, it is difficult to assess the awareness of and compliance with the ESoP HMI principles by the vehicle and portable device industries. Requiring a certification of nomadic device installation has a large potential to bring the nomadic device industry to the table. Through the eSafety Nomadic Devices Working Group, ACEA is working with Nomadic Devices providers to jointly make commitment to the ESoP. The eSafety Forum Working Group on eSecurity, established at the end of 2006, covers the issues relating to the prevention of misuse and manipulation, since the principles contained in the update of the ESoP are insufficient to ensure this on a sustained basis and new technical standards are needed. From January 2009, the eSafety WG-HMI will recommence activities to consider the desirability and practicality of ESoP development. With regard to the workload assessment methodology, satisfactory progress appears to have been made, as described above.

Report on the progress of HMI Recommendations

Current Status

To reduce the risks associated with the new in-car information, entertainment and safety systems, the EU published in 1999 a European Statement of Principles (ESoP) for Information and Communication Systems. The eSafety Forum established the HMI Working Group in February 2003 to address these issues..

Following the recommendations of the eSafety Report, the HMI WG considered amendment and development of the existing ESoP, taking into account the views expressed by Member States and including issues of HMI safety assessment and nomadic and after-market devices.

The HMI Working Group assessed the technical progress in collaboration with the industry and the Member States, and proposed a series of further measures on HMI in its final report of 2005.

The EC has acted on one of the recommendations and formed an Expert Group to update the ESoP on HMI. A new version of the ESoP was drafted taking into account national experiences and industry best practices, along with Recommendations on Safe Use and Implementation Recommendations. These three documents were reviewed prior to being sent to the EU Member States, the European Parliament and the European Council and were published as an official EC Recommendation on 6 February 2007.

The recommendations foresee a close cooperation with the Member States for both the dissemination of the principles and the possible transposition into national legislation, promotion of good HMI principles as an incentive for innovation and competitiveness for the European industry and for affordable and user friendly products for the citizen, the signature of voluntary agreements, and standardisation activities.

The recommendations also include the following principles:

1. *Member States* should:
    - monitor activities linked to HMI;
    - disseminate the new Recommendation to all relevant stakeholders and encourage them to adhere to it;
    - perform a continuous evaluation and monitoring of the impact of this text;
    - report to EC about dissemination activities and results of applications (18 months);
    - undertake market surveys to better understand the definition and dynamics of the market for after-market and nomadic devices;
    - continue evaluation and monitoring of the impact of the ESoP and the safety in use of in-vehicle information and communication systems especially among manufacturers of after-market systems and nomadic devices;
    - enforce safe fixing of nomadic and after-market devices e.g. through ECE R21.
2. *Vehicle manufacturers*, *device manufacturers* and *service providers* should:
    - commit to the principles;
    - enter into a voluntary agreement (9 months);
    - cooperate leading to smart interfaces;
    - provide clear safety instructions to drivers;
    - design devices and functions intended for use while driving.

3. *Employers, point of sales,* and *vehicle hire companies*:

- should commit to the principles (9 months);
- employers' procedure and incentive should not cause or encourage system misuse
- employers should provide adequate training;
- employers should ensure that a copy of the manufacturers instructions is available;
- employers should ensure that all in-vehicle information systems are maintained in accordance with the manufacturer's instructions;
- point of sales promotion should not encourage unsafe use;
- point of sales information should inform vehicle purchasers of the safety issues associated to these systems;
- vehicle hire companies should ensure maintenance of these systems according to manufacturer's instructions;
- vehicle hire companies should ensure copy of the manufacturer's instructions in each equipped vehicle;
- vehicle hire companies should have the knowledge concerning these systems and should offer instructions in their safe use.

4. *Users*:
   - should always be in full control of the vehicle (Vienna convention 1968);
   - should ensure that nomadic devices and after market devices are installed and maintained in accordance with the manufacturers' instructions;
   - are responsible for modifications to any system;
   - should use the systems as recommended by the manufacturer (period of familiarisation or training);
   - should not use nomadic devices hand held or unsecured within the vehicle while driving;
   - should transfer relevant documentations to the next vehicle owner.

The ESoP does not specify measures against all kinds of misuse (e.g. intended misuse) and against manipulation. The eSafety Forum established the Working Group on eSecurity at the end of 2006 to cover the issues relating to the prevention of misuse and manipulation, and new technical standards are needed. Technical solutions can tackle misuse, manipulation and attacks at the root have been assessed as a more effective approach compared to a mere legal approach.

Against the background of the publication of the update of the "European Statement of Principles on Human Machine Interface" on 2 February 2007, the June 2007 eSafety Conference in Berlin addressed the implementation and update of this EU Recommendation and reached the following conclusions:

1. There are several ways for ensuring that the update of the ESoP is complied with and implemented. Voluntary self-commitments by the addressees of this EU recommendation (stakeholders) are, in principle, the preferred option compared to regulations or consumer protection requirements.
2. Special attention must be paid to issues relating to the safe integration and use of portable systems (so-called nomadic devices) when updating the ESoP.
3. Given the need for a level playing field, it is especially important to achieve equal and balanced participation by all stakeholders in the voluntary self-commitments to the ESoP update.
4. The principles of the ESoP update which address issues relating to the prevention of misuse and manipulation are insufficient to ensure this on a sustained basis and there must be new technical standards independent of the ESoP. Work has already started on this thanks to the establishment of the eSafety Forum Working Group on eSecurity.
5. Against the background of continuing developments in the field of science and technology, and the lessons learned from the current update of this recommendation, it is desirable that the ESoP is updated again.
6. If the ESoP is updated again, its scope should be addressed in depth, in order to take currently excluded systems into account, if this appears appropriate on the basis of the state of the art.

During the ITS World Congress in Beijing, held in October 2007, there was a special session on international comparisons of ESoP with Japanese and US approaches.

During the Member States meeting of 30th September, the following recommendations were made:

- The eSafety Forum should re-establish the Working Group on Human Interfaces and make sure that all relevant stakeholders are represented in the working group. In particular vehicle and nomadic devices manufacturers, but also other stakeholders such as service providers, user representatives, research institutes, authorities, etc.
- The Working Group (WG) on Human Machine interfaces should work on the basis of Terms of Reference which contain the following elements:
    - The WG will check whether an update of the ESOP 2008 is recommendable or not and report its findings in autumn 2009 to the eSafety Forum.
    - It will review the state-of-the-art and the technological progress made since the recent adoption of ESoP to verify whether ESoP's scope is still suitable or needs enlargement.
    - It will take into account the questions raised in today's meeting and check whether clarifications in the ESoP are needed.
    - It will scrutinize ESoP with respect to sufficient coverage of the different requirements induced by the variety of vehicle users.
    - It will look in depth into aftermarket issues, specifically related to nomadic devices

- It will discuss protection against misuse and manipulation in cooperation with eSecurity WG of the eSafety Forum.

- The co-chairs of the eSafety WG on Nomadic Devices should be requested to report to the eSafety Forum on the progress achieved with regard to the implementation of the ESoP and the next steps planned.
- The eSafety Forum should check whether a close cooperation between the WG on Nomadic Devices and HMI WG could generate synergies.
- A paper ESoP should be presented in the UNECE Working Party (WP) 29 (Intelligent Transport Systems) to trigger a respective work item for WP 29. The UK representative, Mr. Sopp volunteered to draft a presentation, distribute it to the attendees and present it after their approval to UNECE WP 29.
- Member States are invited to intensify their awareness raising actions. The Commission is asked to facilitate the exchange of best practice in dissemination actions.

European R&D has addressed HMI within several projects, such as:

- AIDE (www.aide-eu.org), generating the knowledge and developing methodologies and human-machine interface technologies required for safe and efficient integration of ADAS, IVIS and nomadic devices into the driving environment;
- COMUNICAR (www.comunicar-eu.org), designing, developing and testing an easy-to-use in-vehicle multimedia Human-Machine Interface
- EUCLIDE (www.euclide-eu.org), developing an innovative human-centred driver support system to be operable in case of the driver's lack of obstacle perception, due to reduced visibility conditions and adverse weather conditions (the system supports the driver in a continuous mode), and driver's impaired or erroneous behaviour under different traffic scenarios (the system supports the driver only when the vehicle is entering in a potentially dangerous situation).
- AWAKE (http://www.awake-eu.org/), taking HMI into account while aiming at developing an integrated system capable of detecting driver status problems (alcohol, drowsiness, etc.)
- HUMANIST (www.noehumanist.org), promoting human-centred design for IVIS and ADAS to conceive them according to drivers' needs and requirements in order to ensure their acceptability and improve road safety.
- RESPONSE3 (www.prevent-ip.org/en/prevent_subprojects/horizontal_activities_/response_3/) aiming to obtain a Code of Practice for the development and testing of ADAS for the European industry, and giving a basis for definition of 'safe' ADAS development and testing - from also the legal point of view - including ADAS specific requirements for system development.

Further developments are also being made by the Nomadic Device Forum, which was launched in June 2005 by the AIDE project in collaboration with ERTICO – ITS Europe. The Forum acts as a consensus forming body and is addressing, amongst other issues, the safety threat nomadic devices could pose and how the ESoP should be applied. It also has active working groups on business/commercial issues and on communication requirements between vehicles and nomadic devices. It can also be noted that a recent standardisation proposal for nomadic device communications is under consideration by ISO. Since the project AIDE is going to be concluded soon, the possibility of including the Nomadic Devices Forum among the eSafety working groups is currently under study.

Contacts:

Dr Alan Stevens, TRL, astevens@trl.co.uk

Dr Christhard Gelau, BASt, gelau@bast.de

2.2.4 Road Maps for Intelligent Integrated Safety

Recommendation number and title

7a) Develop Road Maps with technical steps and economic implications for the introduction of intelligent integrated road safety systems in Europe.

7b) The public sector Road Maps should indicate the investments required for improvements in the road networks and information infrastructure.

Activity leader

7a) Automotive industry

7b) Road authorities

Introduction

The market introduction of Intelligent Vehicle Safety Systems involves policy, technological, societal, business, legal and consumer aspects. The creation of implementation road maps for eSafety technologies to elucidate the steps to deployment and support the development of coordinated activities of eSafety stakeholders, is necessary. The road maps need to be continuously updated, with the fulfilment closely monitored. Therefore, the proposed indicators to monitor the progress of these recommendations are the following:

Indicators of progress of the recommendations

7.1) Creation of the Road Maps	The Implementation Road Maps Working Group produced so-called "simplified road maps" describing the market penetration or deployment speeds for two cases: business "as usual" (no extra measures to accelerate the roll-out of eSafety systems) and supporting actions (fiscal incentives, enhanced customer awareness programmes, insurance incentives, EU support actions for deployment (e.g. TEN-T support) and standardisation). These road maps covered the eleven priority eSafety systems. Two new priority systems have now been added: emergency braking and dynamic navigation. The eCall Driving Group created a detailed road map for the roll-out of the pan-European emergency call by 2009, which was extended to 2010 in the EC Communication "Bringing eCall back on track – Action plan" published in November 2006. The RTTI Working Group produced a list of recommendations to support the roll-out of RTTI systems, while the Speed Alert project developed a specific road map for these systems.
	Electronic Stability Control (ESC), due to the joint efforts of the members of the "eSafety Aware!" public awareness platform, enjoys

7.2) Progress of the Road Maps	rapidly growing implementation in Europe. The "Choose ESC" campaign is helping to build awareness, bringing other effects such as a possible European regulation to make ESC compulsory in EU vehicles by 2012. Fiscal and insurance incentives have been implemented in very few cases (see recommendation 24). The EU-level mandating of ESC in all new vehicles is currently being prepared. **Adaptive Cruise Control** (ACC), **Adaptive Head Lights** (AHL), **Blind Spot Monitoring** (BSM), **Lane Departure Warning** (LDW) and **Obstacle and Collision Warning** (OCW) systems are progressively available in more models of new cars. The safety benefits of ACC, AHL, BSM LDW and OCW need to be verified in accident analyses in order to assure public authorities and insurance companies of their actual benefits before any decisions can be made on incentives (see Recommendations 3 and 4). The recent eIMPACT project has now shown that especially LDW and BSM have high safety potential, and the TRACE project indicated similar for OCW. Clearer liability policies need to be created in order to safeguard the customer's interests while not hindering the roll-out of the safety improving systems. User awareness should be increased by including and maintaining these systems in the EuroNCAP system, which requires that the identification and performance of various ACC, AHL, BSM, LDW and OCW systems in different cars can be verified in a satisfactory manner. Information campaigns are necessary to promote the benefits of these systems, and the information should also be included in the education programmes of driving schools and automobile clubs. In addition, car dealer training should include information of the operation and benefits of blind spot monitoring. These aspects, existing as milestones in the road maps, need to be taken into consideration as soon as possible for a massive deployment of the systems. These findings were also confirmed at the "User benefits driver the markets" workshop in November 2008. The workshop also identified major fleet owners, being responsible for one third of new vehicle registrations in Europe, to be and important target for awareness build-up. There is a pressing need to find ways of making the benefits of eSafety systems more tangible to drivers and vehicle buyers as well as to present the messages in a simple enough manner. The status of fulfilment of the **eCall** road map milestones is dealt with in the section referring to Recommendations 12, 13, 14. **Road Traffic and Travel Information** (RTTI) implementation issues and the progress of the RTTI recommendations are more specifically analysed in the section referring to Recommendations 15, 16, 17. For **Extended Floating Car Data** (FCD), safety and other benefits, as well as the cost/benefit ratios in different conditions and testing the technical performance of the system in large scale demonstrations all needs to be undertaken. The flow of information between the

	vehicles and the FCD servers, and between the FCD servers and traffic information or management centres (both public and private) needs to be clarified, while maintaining privacy of equipped vehicles. The development of good business models for European conditions is a key success factor so that all stakeholders - including the drivers - have a sufficient business case. For **Dynamic Traffic Management** (DTM) and **Local Danger Warning** (LoDW), the safety benefits of all new types of systems need to be verified with actual accident data. The implementation of the FIVE framework must be ensured by the European road authorities and operators in order to achieve harmonisation according to user needs and requirements. A common European strategy for deploying and operating DTM, LoDW and also other infrastructure-related eSafety systems has to be developed and maintained by the road authorities and operators together with the other stakeholders. The European Commission should continue to provide their funding support to the deployment of these systems within the context of the TEN-T programme as well as other instruments to ensure deployment on the critical road sections outside the TERN. A major advance in the direction is the EasyWay project (2007-2013) involving road operators from 21 EU member states employing DTM and LoDW among other core European ITS services. Many road and other authorities are regarding **Speed Alert** as a key system for improving road safety, and the large-scale implementation in the near future will depend on European and national regulations aiming at mandatory or voluntary deployment of the system. The most urgent factor is the need for an accurate and up-to-date speed limit database that is readily accessible to all potential service providers (see recommendation 11). Recent market developments indicate that use of video sensors for speed limit recognition may provide a feasible alternative to the solution based on satellite positioning, digital maps and speed limit databases.

Analysis of the progress

	There are road maps available for several eSafety systems (with different level of details). The Implementation Road Maps WG has specifically analysed the implementation issues. The eSafety implementation status survey published in November 2007 revealed that roll-out is ongoing but not very fast except for ESC and RTTI, this matter due to the fast and still accelerating market penetration of navigation systems. In addition, the European Commission has initiated its own ITS Action Plan for accelerating the deployment of intelligent systems and the European road administrations have started to develop their own eSafety road map in support of the eSafety Forum's activities. The eSafety Deployment Workshop organised by the eSafety Forum's

	Implementation Road Maps Working Group showed that the deployment in Europe is approximately on the same level as in Japan, although Japan is more advanced in some fields but a bit behind in some fields. The user benefit workshop in 2008 concentrated on user benefits, their magnitude, relevance to different stakeholders, and how they drive the market. Both of these workshops were combined with the presentation of the annual eSafety Awards. These awards have attracted media attention and are held in great esteem by the persons and organisations awarded. The eSafety Awards are thereby likely to promote the deployment of intelligent vehicle safety systems. A structured monitoring process is planned to be created which will show the appropriate way to monitor the deployment of eSafety systems in future. The time line might be expended to the year 2015 for the possible achievements of eSafety devices in case of road safety and reduction of fatalities. The current road maps are being updated taking on board the recent developments concerning the priority eSafety systems, market introductions of new eSafety systems, results of the eIMPACT and TRACE projects as well as national studies related to the deployment of intelligent vehicle systems. The current status of the implementation road maps is to be published in a specific Monitoring report in 2009.

Report on the progress of Implementation Road Maps recommendations

Current Status

The market introduction of Intelligent Vehicle Safety Systems involves policy, technological, societal, business, legal and consumer aspects. From the public sector point of view, it would be beneficial to estimate a market introduction timetable and use this information to plan for investments and the necessary measures for enabling take-up. Therefore, there is a need to produce road maps for eSafety technologies to support the development activities of eSafety stakeholders.

The Implementation Road Maps WG, which commenced its activities in July 2003, had the following initial objectives:

- Identify the technical and economical potential of the industry, as well as the topics and timetable for public sector infrastructure improvements with regard to eSafety systems capable of affecting road fatalities in Europe by 2010;
- Develop regularly reviewed road maps to focus on technological steps and economic implication models for the introduction of intelligent integrated road safety systems, as well as the required improvements in road and information infrastructure;

After collecting the necessary information about eSafety relevant systems, a suitable structure was found to define the vehicle-based systems, as well as infrastructure-based systems and combined solutions like eCall. The evaluation of these different systems has reflected the following aspects:

- Accidents/fatalities to be affected
- % change in accidents expected
- other side effects/comfort functions
- cost of in–vehicle systems
- cost for infrastructure systems (investment/maintenance)
- cost for information infrastructure (investment/maintenance)
- year of technical readiness
- year of implementation readiness
- user acceptance and willingness to pay
- year of implementation by regulation
- specific implementation issues
- estimation of cars equipped with at 2010 / 2020
- other actors involved for implementation

Not all questions could be appropriately answered, but it was possible to create a table of prioritised systems that will have a reasonable impact on the number of fatalities within a reasonable timeframe for deployment.

The priority vehicle based systems are (in alphabetical order):

- Adaptive head lights
- Blind spot monitoring
- ESC (Electronic Stability Control)
- Lane departure warning
- Obstacle & collision warning

The priority infrastructure-related systems are (in alphabetical order):

- Dynamic traffic management
- eCall
- Extended environmental information (Extended FCD)
- Local danger warning
- RTTI (Real-time Travel and Traffic Information)
- Speed Alert

Tables have been produced for autonomous vehicle-based systems as well as the vehicle- and infrastructure-based systems of eCall, extended environmental information, RTTI, dynamic traffic management (VMS), local danger warning, and Speed Alert. The tables will be validated in consultation with the key stakeholders. A table has also been drafted showing the eSafety functions and their technical prerequisites.

The following recommendations were given for in-vehicle systems:

a. The automobile industry, the EC, the Member States and other stakeholders should enhance the customer awareness of the safety benefits of such in-vehicle systems through well-structured and harmonised European campaigns;
b. Member States and insurance companies should give financial/fiscal incentives to customers who vehicles equipped with such systems. For this purpose, the discussion should start without further delay to clarify the possibility for incentives given by insurance companies or public agencies;
c. All stakeholders should develop feasible sustainable business models for each application on the principle that stakeholders benefitting from the eventual reduced accident-related costs should share these benefits those stakeholders undertaking the investment and costs. These should also cover nomadic devices.

The following recommendations were given for autonomous vehicle systems.

To increase and accelerate the market penetration of eSafety systems with highest safety benefits, such as ESC:

d. EuroNCAP should incorporate such systems into its rating system as soon as proven technology and safety benefit data becomes available and the functionality of the systems can be adequately tested. Currently, ESC and Speed Limiter are on the list;
e. The EC and the Member States should consider regulatory actions (such as making a system mandatory in new vehicles) only as a last option, when such action is judged as essential and beneficial for both industrial and public stakeholders. Socio-economic reasons and the principle of subsidiarity are other important decision criteria. Voluntary solutions should be encouraged;
f. Member States and industry should follow the recommendations of the HMI WG to ensure future user acceptance and a safe application and function of the systems during their entire life cycle;
g. The automobile industry, EC, Member States and other stakeholders should continue their R&D efforts to develop new technologies and solutions for in-vehicle safety systems, as well as to evaluate the effects of eSafety systems on safety, economy and employment.

The following recommendations were given for infrastructure-related systems.

To increase and accelerate the deployment of safety beneficial infrastructure-related eSafety systems:

h. Member States should ensure the deployment of socio-economically feasible systems and services according to their responsibility and in line with the requirements accepted on the European level.
i. The EC should support the deployment of infrastructure-related systems on the TERN as well as other key parts of the road networks with the instruments at their disposal (e.g. TEN-T programme).
j. The industry, EC and Member States should take actions together to ensure that digital maps with the information required by the eSafety systems would be developed for all roads in the Member States.
k. The EC and Member States should agree on actions and instruments to increase the willingness of countries and regions to take on the role as "early adopters" for eSafety systems.
l. The EC and Member States should continue R&D efforts to develop new technologies and solutions for infrastructure-related safety systems as well as to evaluate the effects of such systems on safety and other socio-economic factors.
m. Concerning eCall, the EC, Member States and the industry should follow the recommendations of the eCall Driving Group.
n. Concerning RTTI, the EC, Member States and the industry should follow the recommendations of the RTTI Working Group.
o. Concerning dynamic traffic management and local danger warnings, the road authorities and operators should develop together a European vision and strategy for the deployment and operation of dynamic traffic management and local danger warning systems in co-operation with vehicle and telecommunications industry.

p. Concerning speed alert, the EC and the other stakeholders should tackle unresolved issues and utilise the implementation roadmap produced by the SpeedAlert project.

To monitor the status of implementation of the eSafety systems, the Implementation Road Maps WG, together with eSafety Support, prepared a survey concerning the deployment of the road maps in Europe on the national level.

The Implementation Road Maps WG estimated the deployment/market penetration of these systems in crude terms for 2005 and for the EU15. In the summer of 2006, the Implementation Road Maps WG initiated a survey on the deployment and coverage of the 11 priority systems in the 25 Member States plus Norway and Switzerland, but only received responses from five countries and none of these was complete. In July 2007, eSafety Support funded a survey on the implementation of eSafety systems, whose results were presented at the eSafety Deployment Workshop and Award Ceremony on 14 November 2007.

The study will provide data on market penetration based on the following indicators for each country:

- Vehicle-based systems + eCall, Extended FCD, RTTI, Speed Alert:
  - % of equipped cars out of all new cars sold the previous year, or
  - % of cars having the system as a standard or optional equipment out of all cars sold the previous year

- Lane departure warning, eCall, Extended FCD (terminal), RTTI (terminal),Speed alert:
  - % or all cars equipped with an aftermarket/nomadic system
- Road weather monitoring*, Traffic monitoring*, Travel time monitoring*, RTTI services, Dynamic traffic management and infrastructure based Local danger warnings (* = used for RTTI services):
  - % of the road network with frequent traffic problems equipped with the system of sufficient coverage and quality (together with the length of network in km)
  - % of the strategic roads in large urban areas (>100,000 population) equipped with the system of sufficient quality and coverage

Contacts:

Mr Risto Kulmala, VTT, risto.kulmala@vtt.fi

Mr Hans-Jürgen Mäurer, DEKRA, hans-juergen.maeurer@dekra.com

2.2.5 Intelligent Integrated Road Safety Systems including ADAS

Recommendation number and title

8) Analyse existing accident causation data and possible countermeasures and determine clear goals and priorities for further RTD.

Activity leader

Automotive industry

Introduction

This Recommendation ensures that the current European eSafety research activities reflect the necessary systems approach. The European Union's RTD programmes have contributed in realising the leading edge technologies, systems and applications which form the basis for many of the active safety systems installed in vehicles today. However, the development of the Intelligent Vehicle Safety Systems still requires further RTD in a number of technologies. The critical task is to determine the priorities for further research based on analysis of accident causes and the impact of potential countermeasures. A specific eSafety Forum Working Group - RTD WG - was established to determine the priorities for further research. The proposed indicators will measure the identification of goals and priorities on different time horizons.

Indicators of progress of the recommendation

8) Goals identified for future RTD	The RTD WG identifies the priorities for research areas for integrated European research, technology and demonstration projects in the field of eSafety. In 2005, the group identified the next research priorities: more work was needed in accidentology, human factors, interoperable co-operative systems, ITS services and also some non-technical issues. It identified the need of a Joint Technology Initiative on Co-operative eSafety Systems as a means for pushing the frontiers of the research forward, evolving into the "Intelligent Car" flagship initiative. In 2006, to contribute to the FP7 work programme on ICT for Mobility, the RTD WG, in cooperation with the EC and other stakeholders, issued the "Strategic Research Agenda – ICT for Mobility". This declared the objectives of future research to further develop and deploy technologies, functions and services to enhance traffic safety, efficiency and reduce the impact on the environment, identifying "horizontal" aspects such as standards, and common communication links. In 2007 the RTD WG discussed the priorities to prepare an input on ICT FP7 Work programme for 2009 – 2010. The working

	group formulated specific recommendations in the field of mobility of people and goods, intelligent vehicles and infrastructure, and field operational tests, identifying specific high priority R&D topics. The work resulted in an update of the "Strategic Research Agenda – ICT for Mobility", which was endorsed by the eSafety Forum during the 9th Plenary Session in April 2008. The RTD WG also took on to make an inventory of the need and justifications of International R&D Collaboration. A Task Force worked on this issue during later part of 2007, and their findings were integrated into the recommendations for ICT FP7 Work programme for 2009 – 2010. Additionally a separate presentation of the International R&D Collaboration topics was made.

Analysis of the progress

	The eSafety research priorities are determined by the European Commission in close cooperation with the stakeholders. One of tasks of the RTD WG is to identify the priorities for research areas for integrated European research, technology and demonstration projects in the field of eSafety, to monitor the development of the research programme and keep it synchronised with the stakeholders' needs. Strong cooperation has led to the identification of the strategic priorities for FP6 and FP7, as well as creating an understanding of needed and non-needed International R&D Collaboration.

Report on the progress of RTD recommendation

Current Status

More than half of the R&D efforts analysed focus on electronic systems and enabling technologies for accident prevention and in-vehicle protection systems. It emerges that the current European eSafety research activities do not reflect the necessary systems approach. Research activities in accident causation, road and telecommunications infrastructures; as well as post accident call and issues around cost benefit analysis and efficacy of safety measures need more R&D investment. European research activities should be structured to be complementary to activities in other regions (USA and Japan).

The RTD working group's goal is to identify and map the regional, national and European research, technology and demonstration projects that may contribute to addressing the recommendations of the High Level Group on eSafety. The WG has established mechanisms for monitoring, aligning and steering such projects so as to maximize synergies and disseminate results. It has also identified the priorities for research areas for integrated European research, technology and demonstration projects in the field of eSafety.

The RTD WG presented its final results and recommendations at the eSafety Forum Plenary Session held in June 2005. It concluded that more work was needed in accidentology, human factors, interoperable co-operative systems, ITS services and some non-technical areas. It also stressed the importance of an integrated approach, and proposed the setting up of a Joint Technology Initiative on Co-operative eSafety Systems as a means for pushing the frontiers of the research forward. This proposal evolved into the "Intelligent Car" flagship project of the Commission's i2010 strategy. These recommendations were taken into account and a set of projects was launched in Call 4 of FP6.

After the creation of the "Intelligent Car Initiative" and in preparation of the launch of the FP7, the RTD WG undertook the following tasks, namely to:

- Advise, support, monitor and review the development, implementation and outcome of the Strategic Research Agenda for "ICT for Mobility", FP7.
- Promote the RTD pillar of the Intelligent Car Initiative.
- Survey and support the activities and their synergies at national and EU level.
- Promote, monitor and guide the R&D contribution to the achievement of safe, clean, efficient and secure road traffic and transport and the global competitiveness of EU industry.

During April-May 2006, DG INFSO organised targeted expert meetings to develop and formulate recommendations and priorities for R&D in FP7 on the following five topics:

- Mobility Services for People
- Mobility Services for Goods
- Intelligent Vehicle Systems
- Cooperative Systems
- Field Operational Tests

Afterwards, in order to contribute to the FP7 Work programme on ICT for Mobility, the RTD WG held a sixth workshop at which the five above recommendations were discussed in relation to the objectives to improve road transport and European industrial competitiveness. It issued the "Stakeholders' contribution to the Development of FP7 Work Programme on ICT for Mobility" report which declares the objectives of future research to further develop and deploy technologies, functions and services to enhance traffic safety, efficiency and reduce the impact on the environment. Additionally, "horizontal" aspects such as standards, and common communication links were identified as issues belonging to the research agenda. The final version "Strategic Research Agenda – ICT for Mobility" was released in December 2006.

The identified priorities were taken into consideration into FP7. These include continuing ICT research in Intelligent Vehicle Systems whose key targets are increased performance and reliability as well as to make cars *cleaner*, research in mobility services for people, 'always-on' mobility services, mobility services for goods targeting safer, more secure, efficient and environment-friendly ICT-based freight transport solutions in both urban and long-haul operations. In addition, ICT research in Co-operative Systems will be continued, delivering advanced, reliable, fast and secure vehicle-to-vehicle and vehicle-to-infrastructure communication for new functionalities, real-time traffic management and new levels of support to active safety systems in vehicles and to the driver. One priority is also the funding of large-scale Field Operational Tests (FOTs) aiming at a comprehensive assessment of the efficiency, quality, robustness and user-friendliness of ICT solutions for smarter, safer and cleaner vehicles and real-time network management (see Recommendation 4).

The RTD WG identified that business cases/model aspects are a currently a real problem at the moment and should be included in the FOT activities, since the opinion and acceptance of the final customers (of services and systems) are very important to find the right understanding of the cost model. The research should better cover the benefits of ICT system, such as travel behaviour, safety and environmental impact.

Scale of economy for ICT systems, e.g. through using same sensors for several functions.

System view of ICT – Transport Systems needs to be stronger promoted in the FP7 Work Programme and accepted projects.

The RTD working group identified the following additional R&D needs:

1. Integration Aspects
    a. Drivers reaction on several systems action together
    b. Technological, architectural synergies
    c. HMI integration
       Driver in the centre
       Easy usability (for the driver) of all ICT functions
       Individual adaptation to the driver. Intuitive, self-learning systems
    d. Systems and Functionality integration

2. Horizontal issues
    a. Need of maps serving many applications
    b. Drivers' input to navigation systems
    c. Learning, adaptive navigation systems
    d. Maintenance of maps, in particular maps used in/for safety systems
    e. Modification of maps. Today there are too many uncorrelated actors which make changes to roads and streets. A universal map should be made available for all qualified users, and local authorities should have to report their changes to the "keeper of this universal map" (instead of having leading map suppliers responsible for all the changes).

3. Human factors (can be done in FOT)

4. New role of road operators (in the ICT world).
   This was concluded not to be an R&D issue, but rather an institutional one.

5. Cooperative Systems: Structure the complex and wide systems to understand what functions are needed (to be activated) in order to achieve a particular effect.

6. Model for traffic behaviour to simulate safety. The model should include the driver and the road users.

7. Intelligent Travel Space: Making the infrastructure even more intelligent beyond Cooperative Driving, e.g.
    a. Smart Multi- Mode Transport
    b. Use of RFID

8. Security and Safety

9. Traffic management:
    a. the use of the vehicle
    b. the support from infrastructure

10. Local and Regional Traffic Authorities aspects:
    a. More intelligence into the infrastructure
        i. Autonomous
        ii. Self learning
        iii. Self intervening
    b. Data collection in real-time (suitable in FOT).
    E.g. only the city centre of London is instrumented for data collection. The Traffic Centre therefore only knows what happens in the inner London, but not in the Greater London area.
    c. Data fusion
    d. Prediction tools
    e. Decision support systems
    f. Dynamic Navigation allowing intervention by Traffic Management
    g. Traffic Management – Route Guidance of Freight Trucks (through urban areas)

11. Additional Driver Support Functions, e.g.
    a. curve warning through navigation systems
    b. warning of black spots by infrastructure

12. Standardisation of interfaces for sensors, maps, and applications.

13. Nomadic Devices integration in the vehicle, e.g. for navigation.

14. Green Mobility; action plan

15. FOT: Form for collaboration between the necessary and sufficient stakeholders

Major topics of the 2006 Strategic Research Agenda "ICT for Mobility" were addressed in the challenge "ICT for Mobility, Environmental Sustainability and Energy Efficiency" of the ICT work programme 2007-2008. This work programme had two strategic objectives:

- ICT for Intelligent Vehicles and Mobility Services, and
- ICT for Co-operative Systems and FOTs.

The first Strategic Objective in **Call 1** addressed three areas:

- Intelligent Vehicle Systems,
- Mobility Services for People and
- Mobility Services for Goods.

The proposals' majority addressed the Intelligent Vehicle Systems (IVS), but a good coverage was achieved for Mobility Services for Goods as well. Although 25% of the eligible proposals addressed Mobility Services for People, only one support action was highly ranked.

One proposal for the ramping-up of Field Operational Test was retained covering the need of this area conduced to the launch of the FESTA project, primarily addressing preparatory measures for the Field Operational Tests. The project was launched in November 2007 (see Recommendation 4 in section 2.2.2).

While IVS was effectively covered by well-ranked proposals in both research instruments, one aspect of the Work Programme, "the integration of independent safety systems" was only marginally addressed. This activity would advance the widespread, timely take-up of ADAS, with significant consequences for road safety and the environment through energy efficiency. It would also be a key enabler for the cooperation of the European automotive industry's main players and an important opportunity to confirm Europe's global leadership in IVS/ADAS technology. Therefore the objective "integration of independent safety systems and their interaction with the driver" should be considered for the 2009-2010 Work Programme.

The second Strategic Objective in **Call 2** addressed the two areas:

- Cooperative Systems and
- Field Operational Tests.

Three main projects on FOTs were funded: Euro-FOT, Tele-FOT and FOT-Net (see recommendation 4).

At the end of 2007, the eSafety Forum Working Group RTD (eRTD) reviewed the SRA 2006 with the perspective of the outcome of the first and second call of FP7, considering old and new challenges and priorities. As an outcome of this process the eRTD has formulated the following recommendations for future research in the area of ICT for mobility:

1. **Urban and Inter-Urban Mobility of People and Goods: Clean, Safe, Secure and Efficient**

   The transport system (people and goods) is a large energy consumer creating high load on the environment through air and noise emissions. Furthermore, the level of safety in the transport system is still far from acceptable. Additionally, security is of growing concern due to increased criminal acts (thefts, terrorists) and the handling of dangerous goods. It is foreseen that reduction of energy consumption and environmental impact, increased safety and security can be achieved in the traffic and transport network by advanced ICT/ITS information and management systems applied both urban and inter-urban.

2. **Intelligent Vehicles and Infrastructures towards Cooperative Systems**

   For wide spread deployment of ADAS and ICT/ITS systems, also into small and medium class vehicles, there is a need for high integration, cost reduction and reliability increase of these systems. To achieve the next step in safety and efficiency it is absolutely necessary that the infrastructure accelerate its development and deployment for improved sensing, analysis and management of the traffic network as well as delivery of accurate and relevant information to the network users. With these advancements in vehicle and infrastructure significant steps are taken towards Cooperative Systems where the driver–vehicle–infrastructures are connected enabling safety and efficiency applications to be realised.

3. **Field Operational Tests**

   Field Operational Test (FOT) was introduced in the FP7 as a mean to gain experience, collect "figures and facts", conduct impact assessment of ICT/ITS, create awareness etc. FOT projects are presently launched for methodologies developments and tests on autonomous systems. Next generations FOTs should focus on the connection of travellers–vehicles–infrastructure using cooperative systems and on situation specific scenarios (intersection safety; vulnerable road user protection…). In the process of reviewing the R&D priorities the dimension and needs of International R&D Collaboration have also been considered. The resulting recommendations are reported under each of the SRA 2006 areas on the following pages.

In addition to the above general preferences the WG eRTD recommends that the FP7 ICT for Mobility address within the coming years specifically the below selection of high priority R&D topics.

A. Mobility of People and Goods: Clean, Safe, Secure and Efficient

a. Data collection and analysis of the state of the mobility network

b. Integrated traffic and travel information

c. Integrated networks

d. Interoperability and standardisation

e. Security systems for people and goods

f. Clean and efficient goods transports

B. Mobility and Transport in Urban Areas

a. ICT tools for all modes and inter-modality of transport

b. Decision support tools with extended and general traffic modelling

c. Urban goods transports: Sensing, models, strategies, management

d. Integrated payment systems

C. Intelligent Vehicles and Infrastructures towards Cooperative Systems

a. Intelligent delivery vehicles and infrastructure support systems for safe and secure goods transports.

b. HMI:

i. Warning and automation strategies

ii. Functional HMI integration, including flexibility, individualisation

iii. Nomadic device integration

c. Advanced Driver Assistance Systems

i. Full collision avoidance systems

ii. Vulnerable road users protection systems

iii. Applications and systems for driver support at intersections and merging manoeuvres, covering vulnerable road users

iv. Green driving support, e.g. eco-driving, "green traffic management".

d. Technologies

i. Architecture for and highly integration of safety and efficiency functions and systems for cost reduction, reliability etc.

ii. Multi-functional on-board unit with secure integration of multitasking applications (e.g. fleet management, tolling, tachograph).

iii. Enhanced dynamic maps, sensors, actuators, data fusion and extended communication platform

iv. Production technologies to reduce cost and increase reliability

D. Field Operational Tests (FOT)

a. FOT on Intelligent Vehicle Systems and Nomadic Devices

b. FOT on Cooperative Systems:

i. Urban Traffic

ii. Intersection safety

iii. Motorway Driving

c. Naturalistic Driving Observation

d. FOT Methodology: Internationally agreed and shared

E. Horizontal Issues

a. Methods and metrics for driver behaviour assessment.

b. Assessment of ICT/ITS systems impact on green, clean, safe, efficient transport

c. Accidentology

d. Business Model, Deployment, Legal, Liability aspects of ICT/ITS systems

e. Training and Education

Contacts:

Dr Ulf Palmquist, EUCAR (UP@eucar.be).

Recommendation number and title

9) Where necessary, develop specifications for interfaces and communications protocols for vehicle-to-vehicle and vehicle-to-infrastructure communications.

Activity leader

Multi-sector organisation

Introduction

The development and demonstration of co-operative systems for road transport to make transport more efficient and effective is one of the priorities of European research. The following indicators assess the progress in this field.

V2V and V2I communication calls for the discussion and definition of several aspects ranging from spectrum issues to standardisation of protocols. The indicators proposed will take into account the status of progress of these two aspects.

Indicators of progress of the recommendation

9) Frequency allocation, interfaces and communication protocols: specifications developed	The spectrum requirements have been discussed within several bodies. CEPT has been mandated by the Radio Spectrum Committee (RSC) to validate the spectrum requirements for safety critical applications of ITS in the EU, to define the needed level of protection, to perform compatibility studies and to propose a work plan. The final report was delivered in December 2007 and will form the basis of the EU-wide spectrum Regulation by means of an EC Decision. The CEPT validation of the spectrum requirements for road safety and traffic efficiency ITS applications articulated by the industry resulted in an anticipated need for 30-50MHz. The compatibility study results show that protection will be feasible in the range from 5.875 to 5.925 GHz. As there are new technology developments to be expected (i.e. IEEE802.11p will be merged into IEEE801.11, TDMA modulation will be adopted), it is recommended to have this band available during the planned European FOTs. The results of the tests will help to define the best possible usage of the band.. The situation is summarised in the diagram of Figure 5 (source: Søren Hess, Hess Consult). For details refer to the ECC Report 101 and the EC Mandate Report of CEPT The FP6 projects CVIS, SAFESPOT, COOPERS, Sevecom and others worked and are still working on the definition of open, standardised interfaces so that future extensions will be possible. Future extensions will be additional safety functions as well as commercial services using the same equipment to provide i.e. services such as traveller information or fleet management. The

	possibility to create additional revenue streams to re-finance the initial investment will lower the barrier to market introduction of the whole system.

Analysis of the progress

	There is a *threshold problem* which hinders vehicle owners and drivers to buy such systems, hence industry is reluctant to invest without a clear legal and commercial framework. The EC is recommended to take action on this point. Other *business models* are non-existing today, as the commercial value of these systems is unclear or goes to other entities than those who invest (the cost of accidents and fatalities affect insurance companies, public health care etc., not road operators, the car industry or network operators). Spectrum is available, and based on a report from CEPT, the European Commission is expected to issue a Commission Decision on spectrum and regulatory issues. Many functions (such as intersection assistants) will *need infrastructure devices* to support vehicle assistance systems; public (and private) road owners are reluctant to invest (see business model issues above) Sufficient traffic *data for inter-regional and urban traffic management* exists, but public (police, public transport systems, cities, counties and states) and private data owners are not willing to publish those data and their formats are not harmonised. *Cross border data exchange* hardly exists. A COMeSafety-led task force is worked to define an EU-wide *ITS architecture and strategy*. And is in the process of finalising their document, expected by October 2008.

Report on the progress of V2V V2I recommendation

Current Status

Co-operative systems are based on two-way communications, with interaction in real time. Thus vehicles may communicate directly with one another, so that a driver knows for example if another vehicle is on a conflicting course. Vehicles may also provide data directly to a traffic management centre and receive individual traffic information for improved guidance and support in return. These systems can greatly extend the driver's range of perception, providing relevant information on the status of traffic in general and neighbouring vehicles in particular beyond the range of vision. Cooperative systems (as an extension to autonomous or stand-alone systems), in which the vehicles communicate with each other and the infrastructure, have the potential to greatly increase the quality and reliability of information available about the vehicles, their location and the road environment, enabling improved and new services for the road users.

Both Japan and the US have invested heavily in R&D programmes for intelligent road infrastructure and integrated vehicle-infrastructure systems. In Japan, the Advanced Safety Vehicle (ASV) programme addresses vehicle-to-vehicle communication to avoid crossing and right-turn collisions and accidents with pedestrians. Its new Advanced Cruise-Assist Highway Systems (AHS) programme is looking at infrastructure-supported safety systems using DSRC and digital roadmaps. Japan has recently set up an international Vehicle Safety Committee to achieve global standards of vehicle safety, in co-operation with Europe and the US.

In the US, the Intelligent Vehicle Initiative (IVI) is aimed at encouraging driver-assistance technologies, such as collision avoidance systems and diagnostics systems. The recently-announced VII (Vehicle-Infrastructure Integration) programme is aimed at vehicle-infrastructure communication. The US DSRC vehicle-road communication system is intended to link vehicles with the Internet.

The eSafety Working Group Communication, established in fall 2005, has the objective of covering all communication technologies and modes relevant for the general mission of safety, including V2V and V2I. The working group coped with spectrum issues, helping the Commission with CEPT and Radio Spectrum Committee (RSC), standardisation, working together with several groups within ETSI, ISO and the Car-to-Car Communication Consortium. The working group drafted a list of recommendations which where approved by the 7th eSafety Forum in April and were presented and endorsed in their final form at the 8th eSafety Forum in September 2007. They support an EU wide definition of a system comprising the following aspects:

1. **Allocation of protected spectrum in the range of 5.875GHz to 5.925GHz for safety and efficiency-related messages between vehicles, other vehicles and/or infrastructure units so that communication can be maintained without delay or interference, including 20MHz for safety critical messages.**

   European industry in ETSI have presented requirements for European wide harmonisation of spectrum to CEPT and European telecommunication administrations for deployment of ITS within the 5.9 GHz band. Harmonisation is needed in order to enable free movement and seamless border crossing of ITS all over Europe.

The European Commission requested technical information about the spectrum requirements and compatibility issues with the aim to issue a European Commission Decision providing mandatory implementation and availability of spectrum for safety critical ITS applications within EU member states.

The frequency band 5875-5925 MHz has been required for deployment of safety related ITS applications in Europe and the frequency band 5855-5875 MHz for non-safety related ITS. The safety related spectrum requires low latency communication and therefore needs a predictable sharing situation and protection against interference from other services. The non-safety applications can be operated on a non-protected/non-interference basis. The CEPT has studied the background for the spectrum requirements based on realistic traffic scenarios and confirmed that between 30-50 MHz would be needed for safety related ITS applications in the 5.9 GHz band.

Extensive *compatibility studies* performed within the CEPT concluded that within the frequency band 5875-5905 MHz, ITS applications will not suffer from excessive interference resulting from other services/systems and ITS in this band is compatible with all other services providing that the unwanted emission levels are

- less than -55 dBm/MHz below 5850 MHz in order to protect the Radiolocation Services;
- less than -65 dBm/MHz below 5815 MHz in order to protect the RTTT applications;
- less than -65 dBm/MHz above 5925 MHz in order to protect the Fixed Service.

With this conclusion, ITS can achieve a predictable sharing situation and protection against interference from possible new systems and applications of the Fixed and Mobile Service within the band 5875-5905 MHz. ITS can, however, not claim protection from FSS earth stations but the usage of those stations are very limited. The use of the frequency band 5905-5925 MHz for ITS may suffer interference from the Fixed Service above 5925 MHz and will be subject to the same restrictions regarding unwanted emissions as for the band 5875-5905 MHz. The frequency band 5855-5875 MHz intended for non-safety applications is also subject to the same restrictions as for the band 5875-5925 MHz, but in line with the requirements without protection.

ECC Decisions are used within CEPT in the decision making process on matters of significant harmonisation. Implementation of ECC Decisions is formally on a voluntary basis where administrations commit themselves to the implementation and update the national regulation accordingly. ECC Recommendations guides administrations to a certain use of spectrum and are less binding without commitment.

For ITS an ECC Decision has been developed and adopted by the WG FM for public consultation. The Decision harmonise the band 5875-5925 MHz for ITS road safety applications in a two step approach where the sub-band 5875-5905 MHz is designated to ITS on a European basis immediately and the sub-band 5905-5925 MHz considered for future extension within the CEPT review process. It is agreed that both in-vehicle and roadside units will be subject to free circulation and use all over CEPT. On-board units will be exempted from individual licensing and even if authorisation of roadside units is technically not necessary it may be considered by administrations to ensure that different ITS operators can coexist. An ECC Recommendation suggests that CEPT administrations make the frequency sub band 5855-5875 MHz available for non-safety ITS applications on a non-protected/non-interference basis. The ECC Decision and as well the ECC Recommendation were under public consultation until 31 December 2007 and the final adoption is expected at the meeting of the ECC in March 2008. It is then in the responsibility of each CEPT administration including countries outside the European Union like the Russian Federation to implement the Decision and the Recommendation.

Based on a report from CEPT the European Commission is expected to issue a Commission Decision on spectrum and regulatory issues for safety related ITS in the 5.9 GHz band. Implementation of such a decision will be mandatory for EU member states and will ensure legally harmonised spectrum for ITS in Europe.

The CEPT Report to the Commission includes background explanation for the spectrum requirement, spectrum justification, details of the compatibility studies and the level of protection to be afforded to ITS in the 5.9 GHz band. The CEPT has also developed an Impact Assessment with cost benefit analyses on ITS concluding that the benefits of ITS in terms of improving road safety will exceed the opportunity costs of allocating spectrum for ITS on a fully protected basis as soon as the ITS generates a road safety improvement in excess of 1%. The report also concludes that ITS is based on the principle of free movement and seamless border crossing all over Europe which supports a strong requirement for European harmonised spectrum.

The CEPT Report recommends European harmonisation of spectrum for ITS including the two step approach with an immediate frequency designation of 30 MHz and another 20 MHz at a later stage. A European Commission decision on ITS in the 5.9GHz band is expected.

As there are new technology developments to be expected (i.e. IEEE802.11p will be merged into IEEE801.11, TDMA modulation will be adopted), it is recommended to have this band available during the planned European FOTs and to decide on the final bandwith allocation and system design after statistical relevant results have been achieved. The situation is summarised in the diagram of Figure 5 (source: Søren Hess, Hess Consult). For details refer to the ECC Report 101 and the EC Mandate Report of CEPT.

Adoption of the voluntary CEPT decision is expected by the end of March 2008 with implementation until end of 2008. The EC Radio Spectrum Committee discussed a first draft of the mandatory EC Decision in its December meeting and a final version will probably be adopted by mid 2008 with binding implementation by end 2008.

2. **Each vehicle or infrastructure device offering safety and efficiency applications must perform within a minimum set of mandatory parameters so that communication can be maintained with minimal delay or interference.** V2X communication is per se a highly networked system. Therefore, the requirements for minimal delay times, high availability of each node etc. can only be obtained if every device in the network operates strictly according to the standards defined. A weak link in the chain can compromise the whole system and lead to unexpected behaviour. Thus, each component is required to be designed to comply with a minimum set of parameters. The relevant parameters are being defined jointly by ISO TC204/WG16, ETSI TC ITS[5], IEEE 802.11 and C2C-CC and will be verified and refined during the planned field operational tests (FOTs) in FP7 and in regional FOTs.

3. **An EU-wide harmonised deployment plan, including infrastructure and vehicle systems, to ensure market development by providing certainty for investment through a sustainable and feasible business model.** Safety relevant applications based on wireless communication need a minimum rate of vehicles equipped with communication devices and an infrastructure which provides wireless coverage at least at critical points. Dangerous intersections must be equipped with the necessary roadside systems to provide intersection collision warning. At least 10% of the vehicles on the roads need to carry V2V devices to increase traffic efficiency; a much higher penetration rate will be needed for most traffic safety functions. Industry and road operators will only invest in building such systems if all parties follow a harmonised deployment plan so that the C2X functions become effective at the planned date. An EC Decision following the CEPT mandate report will be needed to complete the regulatory certainty regarding spectrum with legal certainty that mandatory deployment in all Member States will happen and by this investment risk will be reduced.
4. **An EU-wide harmonised deployment plan, including infrastructure and vehicle systems, to ensure market development by providing certainty for investment through a sustainable and feasible business model.** Safety relevant applications based on wireless communication need a minimum rate of vehicles equipped with communication devices and an infrastructure which provides wireless coverage at least at critical points. Dangerous intersections must be equipped with the necessary roadside systems to provide intersection collision warning. At least 10% of the vehicles on the roads need to carry V2V devices to increase traffic efficiency; a much higher penetration rate will be needed for most traffic safety functions. Industry and road operators will only invest in building such systems if all parties follow a harmonised deployment plan so that the C2X functions become effective at the planned date. An EC Decision following the CEPT mandate report will be needed to complete the regulatory certainty regarding spectrum with legal certainty that mandatory deployment in all Member States will happen and by this investment risk will be reduced.

[5] Recent changes and replaced ETSI TRM TG37 with ETSI TC ITS.

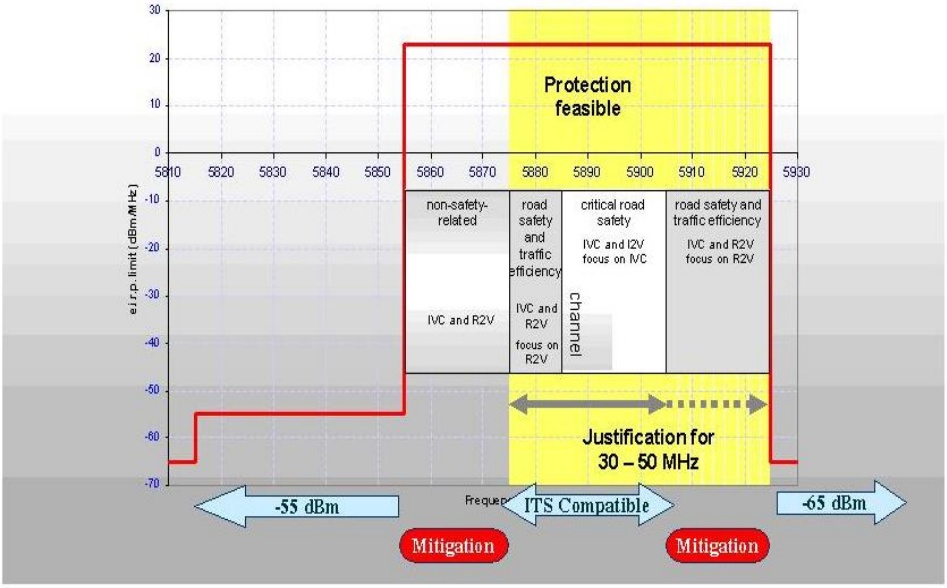

Figure 5 - Result of compatibility studies

5. **Standardised interfaces for all system components are recommended to allow future functions or commercial applications offering additional revenue streams to leverage system investments.** The first generation of V2X devices cannot be designed to accommodate all future functions as the acceptance by users and commercial or public investors very much depends on a low cost level. Therefore the devices must be equipped with open, standardised interfaces so that future extensions will be possible. Currently the FP6 projects CVIS, SAFESPOT, COOPERS, Sevecom and others are working on the definition of such open interfaces. Future extensions will be additional safety functions as well as commercial services using the same equipment to provide i.e. services such as traveller information or fleet management. The possibility to create additional revenue streams to re-finance the initial investment will lower the barrier to market introduction of the whole system.

6. **A legal framework for seamless exchange of traffic relevant data in and between Member States in an unified way - in line with privacy and data protection regulations.** Data exchange between traffic control centres, vehicles and service providers is essential not only for traffic efficiency applications or traffic management but also for safety functions. As an example, hazard spot warnings must be carried across borders with a minimum delay and without the risk that vehicles threatened by the incident do not receive or understand the warning. Therefore an EU-wide harmonised data format and communication protocols are needed. This requires a legal framework to ensure harmonisation, data protection and privacy.

7. **A recommendation to the Member States to provide safety-relevant traffic data in a standard format free of charge to all road users** (in the spirit of EC Recommendation 2001/551/EC). In addition to the legal framework of point 5, it is essential that safety-relevant traffic data must be available free of charge so that cooperative systems can leverage the effects on road safety. The EC Recommendation 2001/551/EC, together with the planned extension resulting from the RTTI WG's 2007 recommendations already covers the distribution of safety-relevant traffic data by broadcast communication. The same logic shall apply to data exchanged by V2X communication (see Final Report of the RTTI WG, Doc. no. 070309-1 of 16.03.2007) and to the use of Floating Car Data (ISO 22837).

8. **A recommendation to the Member States to support the development and adopt common European ITS architecture elements to allow for interoperability in ITS (systems, communication, data, services and functions/applications).** As already explained in point 2, the V2X environment is dependent on seamless network performance across borders and between all connected devices in vehicles or infrastructure. The system performance depends on the different Member States' ITS architectures and how they will be interlinked. Common architecture elements are needed to achieve interoperability and data exchange without losing information or time. With EC support, CEN TC278 WG13 is working on how to integrate national ITS architectures. The Communication WG endorses this effort to reach the goals mentioned above.

The IST 4th Call included eSafety Co-operative Systems on road transport with the objective to develop and demonstrate co-operative systems for road transport that will make transport more efficient and effective, safer and more environmentally friendly. A set of projects covering this topic and coping with different aspects of advanced communication concepts was launched in 2006 (CVIS, SAFESPOT, COOPERS, COM2REACT, Cover, Goodroute, Highway, MORYNE, RESPOSIT, SEVECOM, COMeSafety).

The COMeSafety Project supports the eSafety Forum and especially the WG Communication with respect to all issues related to vehicle-to-vehicle and vehicle-to-infrastructure communications as the basis for co-operative intelligent road transport systems, providing a platform for both the exchange of information and the presentation of results.

The CVIS project will bring major functional improvements to road users and road operators by allowing vehicles to communicate and cooperate directly with others nearby and with the roadside infrastructure. CVIS is developing a prototype for a platform providing a wide range of functionality for journey support, information and security services offered to road operators and drivers. It is also developing a harmonised technology for V2V and V2I communication, based on a multi-channel terminal capable of connection to a wide range of potential carriers, including mobile wireless local area network (WLAN/Wi-Fi), cellular network (GPRS, UMTS), short-range microwave beacons (DSRC), infrared (IR). This schema is based on the new international CALM standard which will provide full interoperability between different car brands and different roadside and infrastructure systems.

Today, many different communication bearers exist, with each one optimised for a specific set of applications.

The last three years have seen a significant effort in the design of new standards in this field. ISO TC204 WG16 has provided a series of draft standards under the acronym CALM (Continuous Air interface for Long and Medium range). In addition, the Car-2-Car Communication Consortium made a substantial step forward and published its "manifesto" in June 2007. This work is a truly global effort since this mobility challenge is global in its scope.

The COMM subprojects of CVIS primarily aim to provide an open reference design for a communication system that fulfills the requirements above. The keywords for these requirements are availability, connectivity, flexibility, and transparency.

The CVIS prototypes and designs will mostly be based on existing techniques and components since the CVIS innovation is largely in the architecture, combining the different media with IPv6 and adding advanced network management. There is no intention to develop optimised products as part of CVIS since that would hinder the open reference design philosophy. The resulting prototype designs can be used directly as suboptimal products, or used as a basis for developing more cost-efficient products.

The CVIS Communication subproject will provide the following results:

- A communication system that fulfils the requirements set by the user community of CVIS within the framework and capabilities of the communication modules selected for CVIS.
- A communication system available as prototype devices to various test beds and field trial sites during the project, and later as open reference designs through open source IPR agreements.
- A continuous two-way contact to the relevant ISO, ETSI, IEEE and IETF standardisation groups so that by the end of the CVIS project, European and global standards are harmonized as close as possible to the CVIS open reference designs.

In FP7, ICT research in co-operative systems will be continued, delivering advanced, reliable, fast and secure vehicle-to-vehicle and vehicle-to-infrastructure communication for new functionalities, real-time traffic management and new levels of support to active safety systems in vehicles and to the driver. By combining technologies such as accurate positioning and improved sensor networking, research is expected to lead towards "zero-accident" scenarios. An increasing number of vehicles with ICT-links to the transport infrastructure will make it possible optimise traffic management at large scale. The results of the evaluation of the first call are not available at time of this report's publication.

The Car-2-Car Communication Consortium and COMeSafety held the first open simulation workshop in March 2007, attracting over 60 participants. Vivid discussions revealed the need for an exchange platform for results and models profiting from this variety. Experts in driving and traffic simulations from DLR, TNO and INRETS gathered in June 2007 under the lead of DLR to discuss how to put the idea of this platform into reality.

An extensive list of European and national R&D activities is the following:

- ADASE II (http://www.crfproject-eu.org/menu.asp?ind=adasefolder&nome=ADASE%20II)
- GST (http://www.gstproject.org/)
- CVIS (http://www.cvisproject.org/)
- SAFESPOT (http://www.safespot-eu.org/)
- COOPERS (http://www.coopers-ip.eu/)
- COM2REACT (http://www.com2react-project.org/)
- Cover (http://www.ist-cover.eu/)
- Goodroute (http://www.goodroute-eu.org/)
- Highway (http://www.ist-highway.org/)
- MORYNE (http://www.fp6-moryne.org/)
- RESPOSIT (http://www.ist-reposit.org/)
- SEVECOM (http://www.sevecom.org/)
- COMeSafety (http://www.comesafety.org/)
- CarTalk2000 project (www.cartalk2000.net)
- PReVENT project (WILLWARN, INTERSAFE subprojects) (http://www.prevent-ip.org/)
- Car-to-Car Communications Consortium (German industry group)
- ROADSENSE project (http://www.cranfield.ac.uk/sme/amac/c2vip/roadsense/)
- INVENT programme (Germany)
- PREDIT programme, ARCOS project (France)
- FleetNet project (DaimlerChrysler)
- SUMMITS project (NL, TNO)
- Roads for the Future (NL, RWS)
- Traffimatics project - CVHS (UK)

Contacts:

Mr Juhani Jääaskeläinen, European Commission, INFSO-eSafety@ec.europa.eu

http://www.europa.eu.int/information_society/programmes/esafety/index_en.htm

Mr Rudolf Mietzner, COMeSafety, mietzner@comesafety.org

Recommendation number and title

10) Pursue international cooperation.

Activity leader

European Commission

Introduction

International cooperation is seen as an important and essential part of the eSafety initiative, strengthening the synergies and avoiding duplication of work taking place in other regions. International cooperation should also lead to the proliferation of functionally compatible systems through standardisation, harmonisation and open platforms, thus benefiting the automotive industry, its suppliers and the travelling public at large.

Indicators of progress of the Recommendation

10.a) Activities coping with International Cooperation	International cooperation is seen as an important and essential part of both the eSafety initiative and eSafety Forum, which established an the International Cooperation Working Group. The WG, active until the end of 2006, did not achieve any progress in 2007 since there was no chair. It restarted its activities in 2008 thanks to the appointment of one new chair. The first meeting of the working group is expected to take place during the 15th ITS World Congress in New York, US, in November 2008. Some EU projects together with some other activities (workshops) are dealing with international cooperation, especially targeting emerging markets. EU-Japan agreements with METI were established in order to assure cooperation in research. A first meeting between experts from EU and Japan on Energy Efficiency took place in April 2008 in Ljubljana, Slovenia. EU-US Implementing Agreement on cooperative activities in RTD in ICT applications in transport signed in Washington during the Transport Research Board (TRB) annual 2009 meeting. EU and US delegations agreed on wide-ranging research cooperation, with short-term, medium term and long term goals, setting up an action plan with milestones for research.
10.b) Coverage of international countries	Several countries are covered by international cooperation activities. Leading markets such as Australia, North America, South Korea and Japan participated in the meeting of the International Cooperation WG, and more recently emerging markets such as Brazil, China, India, Russia and South Africa are covered by several EU-funded projects. Among these countries, China has recently become the priority region for international

	cooperation activities.
10.c) Coverage of eSafety topics	RTTI, HMI, eCall, Accident Causation Data analysis, research to use eSafety techniques for energy efficiency/environmental benefit, V2V and V2I specifications, mobility services, traffic management, standardisation and certification, legal issues, interdependency of privacy security and anonymity, , impact assessment of technologies, socio economic benefits, user outreach, eSafety Business Models

Analysis of the progress

	Although international cooperation is currently undertaken by some EU-funded projects, a higher level of intensity of interaction at the international level needs to be undertaken by the eSafety Forum. Formal bilateral agreements on cooperative agreements were officially signed with Japan and US in 2008. The International Cooperation WG redefined its role under a new chairmanship in 2008 and will pursue its activities preferably in close collaboration with active projects of international cooperation and their networks.

Report on the progress of International Cooperation Recommendation

Current Status

International cooperation is seen as an important and essential part of the eSafety initiative. It is needed to strengthen the synergies and to avoid duplication with work that is taking place in other regions, in particular those playing a leading role in automotive technology (North America and Japan). The problems associated with the development and market introduction of active safety systems are quite similar in the different regions. International cooperation has the potential of avoiding the duplication of efforts of both the industry and the public sector, and avoiding fragmentation of markets through different technical or regulatory approaches. It should also lead to the proliferation of functionally compatible systems through standardisation, harmonisation and open platforms, thus benefiting the automotive industry, its suppliers and the travelling public at large.

Priority-defining work has been carried out to focus international cooperation on eSafety issues of international importance. This work is done in close cooperation with key stakeholders from the US, Japan, China, India, South Korea, and Australia. The next step is to involve new emerging markets in which safety has been a key issue and eSafety has now become a major priority.

The eSafety Forum established the International Cooperation Working Group to support the dialogue at the international level. It coordinates the international aspects of the activities of the other Working Groups and identifies topics/issues in which this cooperation is lacking or should be strengthened.

Topics that appear to offer good opportunities for cooperation between the EU and the emerging markets of China, India, South Africa and Brazil include electronic toll collection, ITS for public transport, integrated traffic management, incident detection and emergency response, pavement management systems/ bridge management systems, alternative and recycled construction materials, heavy vehicles and road wear, alternative fuels, vehicle and pedestrian safety, public transport systems based on buses, and goods transport: security systems.

A questionnaire was sent to 250 eSafety stakeholders in October 2006 to get input about the priorities and future direction for the international cooperation, with results presented at the eSafety Forum Plenary 8 November 2006.

During 2007, the WG was inactive due to the lack of a chairman.

In 2007 the Working Group appointed a new chairman and restarted its activity in 2008. Its priority areas are currently under discussion, but some topics which might well feature in the 2008 work programme are:

- eSafety Business Models
- Interdependency of privacy, security, anonymity
- Research to use eSafety techniques for energy efficiency / environmental benefit
- Vehicle-based Safety Systems
- Infrastructure-based /Cooperative safety systems
- A register of field operational trials and assessment processes
- HMI and driver behaviour
- Mobility services
- Traffic management
- Accidentology

Projects dealing with international cooperation include:

- BITS - bridging the European ITS business cooperation with China - *Concluded*
- DYNASTY - European demonstration of ITS applications in China (http://www.ertico.com/en/subprojects/dynasty/home/home.htm) - *Concluded*
- EU-India – cooperation on eSafety (http://www.euindia.info/) - *Concluded*
- SIMBA and SIMBA II – International cooperation on road transport research (http://www.simbaproject.org/)

- CONNECT — stimulating ITS activities in Central and Eastern Europe (http://www.connect-project.org/) - *Concluded*
- MODIBEC — building cooperation on digital broadcasting convergence with mobile communications between Europe and China (http://www.modibec.org/)
- SPICE — Scanning the Potentialities for Future ICT Research Collaboration between China and the EU (http://www.ict-china.eu/)

Contact:

Frans Op de Beek, TNO, frans.opdebeek@tno.nl

2.2.6 The European Safety Map database

Recommendation number and title

11) Define requirements for a European digital road map database, with agreed road safety attributes. Create a public-private partnership to produce, maintain certify and distribute this database.

Activity leader

Mapping industry, Road Authorities

Introduction

This Recommendation calls for the creation of a digital road map database, available to all users at affordable prices (possibly free of charge), and to which national, local and regional authorities and operators should contribute by providing safety-related data on road configurations within their networks, with target dates for implementation. This recommendation can be divided into a few milestones:

- Definition of a safety-enabled map format;
- Definition of an incremental updating mechanism to increase the map updating frequency;
- Definition of a standardized interface in the vehicle between the maps database and ADAS applications;
- Definition of public-private road data exchange infrastructure;
- Definition of new safety attributes capturing mechanisms.

Therefore the indicator chosen for monitoring the progress of this Recommendation will take into account the two levels necessary for the development of the database: a bottom level tracking the progress of the definition of requirements for a European road safety map database and, once that the definition are consolidated and agreed, the degree of completion of the database (see Figure 6).

Indicators of progress of the recommendations

11.1.a) Definition of a safety-enabled map format	The MAPS&ADAS project (PReVENT) identified the need for safety-relevant map data content, and proposed an update of the existing GDF standard. It developed appropriate methods for the collection, maintenance, certification and provision of safety-related content for in-vehicle map databases. It also supplied the list of safety attributes and determined priorities.

11.1.b) Definition of an incremental updating mechanism to increase the map updating frequency	The ActMAP project investigated and developed dynamic incremental actualisation of digital map databases and has developed a concept of delivery chain for map updates using a standard map update exchange format. This work will result in a standardisation proposal to ISO TC204/WG3.
11.1.c) Definition of a standardized interface in the vehicle between maps database and ADAS applications	The project MAPS&ADAS (PReVENT) has developed, tested and validated a standard interface to provide different ADAS applications access to map and vehicle positioning data provided by one central unit (either stand-alone or part of a navigation system). Even though the PSF initiative, an industrial cooperative of car manufacturers, system suppliers and map suppliers whose objective is the standardisation of a physical storage format for car navigation system, does not specifically relate to safety attributes, due to the momentum of the involved companies it will quickly become a *de facto* standard and all extended attributes will need to be integrated into the developed format.
11.1.d) Definition of public-private road data exchange infrastructure	The EuroRoadS project developed a common data model and exchange format and online delivery tools for digital road databases. However, the project referred to general road-data. The concept developed was not validated by map providers. The ROSATTE project, starting in January 2008, aims at developing the enabling data exchange infrastructure between road authorities and map providers / service providers with focus on road safety attributes. Through the cooperation between public authorities and private location-based content providers for the provision and maintenance of safety attributes, ROSATTE will allow the validation of the results by all the stakeholders, that is, the public sector and the industry.
11.1.e) Definition of new safety attributes capturing mechanisms	The method proposed by the MAPS&ADAS project (PReVENT) also deals with the maintenance of safety- related content for in-vehicle map databases. The ROSATTE project (see above) aims at addressing maintenance of safety attributes and determined priorities.
11.2.a) Availability and accessibility of road safety data at European level	The picture of availability and accessibility of road safety attributes in Europe is still very fragmented. Based on results of the survey in 18 Member States carried out by MAPS&ADAS, Figures 7 and 8 shows the current situation for two attributes (speed limits and accident data (black spots) for several Member States. The data are available or partially available in several countries, but in some countries, the public authorities do not make it accessible to third parties.

11.2.a) Level of introduction of road safety attributes in the available digital maps	Speed limit attributes are currently available in digital maps Europe-wide but with a limited coverage (highways, national roads). Truck-related attributes are introduced in the digital maps of France and Germany.

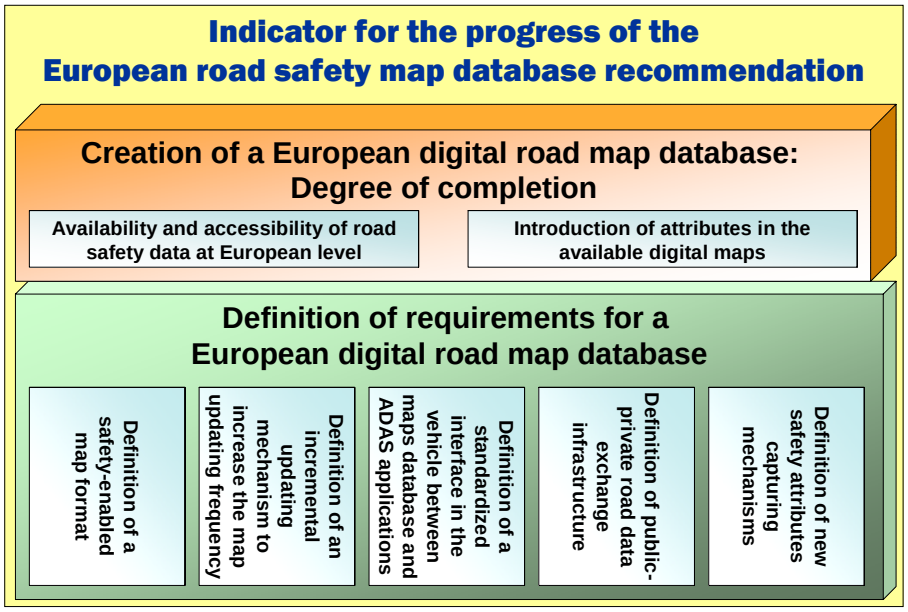

Figure 6 - Breakdown of the indicator for the progress of theee European road safety map database recommendation

Analysis of the progress

	The process of creating a European digital maps database is delayed by the lack of availability and, in many cases, of the accessibility of road safety attributes. The completion of the cooperation phase of the road map defined by the Digital Maps WG still needs efforts to be completed (see the detailed report below).

Report on the progress of European Road Safety Map database recommendation

Current Status

The Digital Maps Working Group was created in April 2005 with the objective of:

- Defining a business model for public-private cooperation to ensure availability of attributes relevant to road safety utilising digital maps. This model aims to support the creation, maintenance, quality assurance and distribution of safety attributes that can be integrated into the digital roadmap databases.
- Defining the requirements for digital map databases which contains road safety-related attributes in addition to normal road map data.

The WG concluded its final report and recommendations in November 2005. The report outlines three phases that need to be implemented if safety attributes are to become available to the mapping industry and integrated into their digital map databases for use in all kinds of road safety applications. They are:

- Phase 1 – COOPERATION: supply of safety attributes in the form that they are currently available to Public Authorities.
- Phase 2 – QUALITY ASSURANCE: Standardisation of information provision and output quality testing.
- Phase 3 – OPTIMISATION: Standardisation of transfer format and transfer media and optimisation of the transfer process.

In June 2005, the European Council's Environment Committee reached a unanimously adopted a draft of the INSPIRE (Infrastructure for Spatial Information in Europe) Directive, which creates a legal framework for the establishment and operation of a geographical information infrastructure in Europe. Its purpose is twofold: to make top-quality geographical data available at all levels across the European Union in order to better implement EC policies, and to give the public access to the information. The Directive entered into force on 15 May 2007.

The following list surveys the projects dealing with the creation of European digital map databases:

NextMAP (2001-2002 - www.ertico.com/nextmap) identified requirements for the future digital map, based on functional requirements of anticipated ADAS and telematics applications. It tested and evaluated the technical and economical feasibility of a digital map based on this enhanced specification. One of the major outputs of NextMAP was the contribution to the GDF standard by formulating a change request to the ISO standard 14825-GDF. This proposal was submitted to ISO/TC204/SWG3.1 in 2002, resulting in a new GDF 4.0 standard accepted in January 2004.

ActMAP (www.ertico.com/activiti/projects/actmap/home.htm) investigated and developed dynamic incremental actualisation of digital map databases and developed a concept of delivery chain for map updates using a standard map update exchange format. This work will result in a standardization proposal to ISO TC204/WG3.

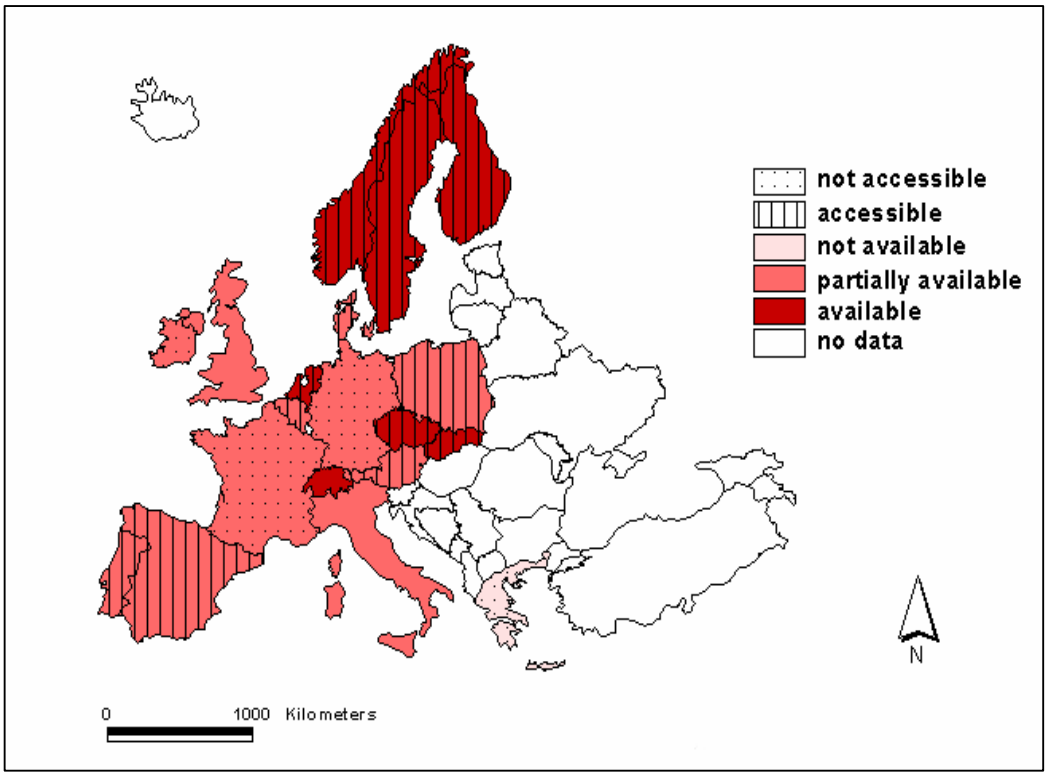

Figure 7 - Speed limit availability and accessibility from the public sector (source: EC-funded PReVENT IP MAPS&ADAS)

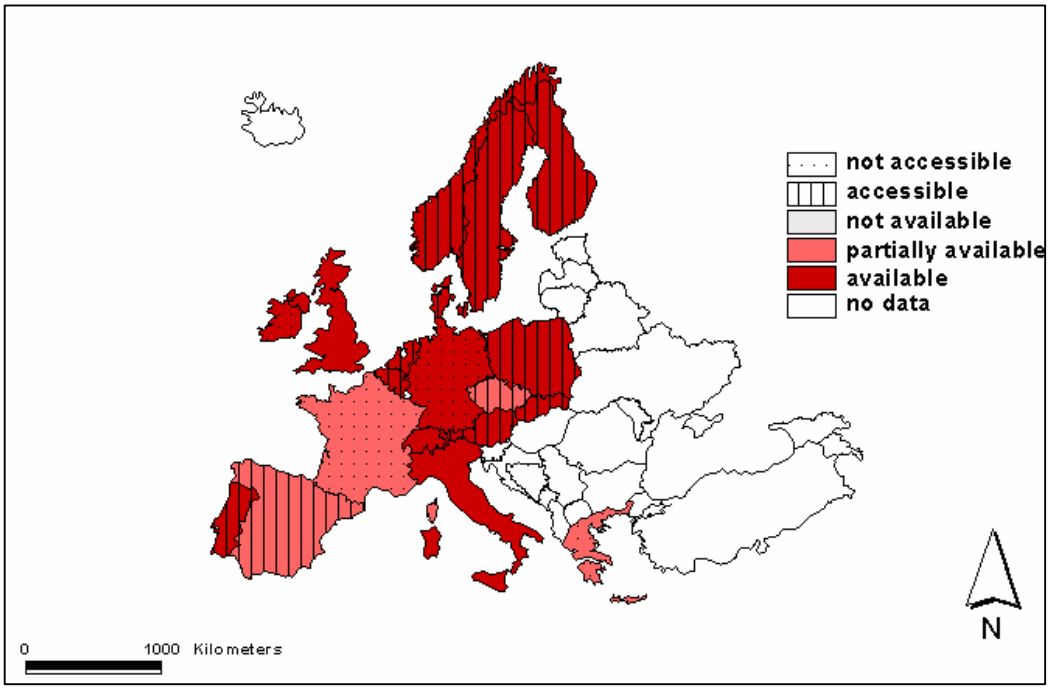

Figure 8 - Accident data (black spots) availability and accessibility from the public sector (source: EC-funded PReVENT IP MAPS&ADAS)

EuroRoadS (eContent programme) (www.euroroads.org) (2004-2006) developed a common data model and exchange format and online delivery tools for digital road databases. The focus was on easing access to national survey and road administration data, to support pan-European applications and products such as speed information, tolling, telematics, ADAS and road management. When successful, EuroRoadS will facilitate the standardised availability of road data and safety attributes are part of it. EuroRoadS therefore can facilitate the standardised availability of safety attributes.

MAPS&ADAS (www.ip-prevent.com) developed, tested and validated a standard method for the collection, maintenance, certification and provision of safety-related content for in-vehicle map databases. It has also developed, tested and validated a standard interface to provide different ADAS applications access to map and vehicle positioning data provided by one central unit (either stand-alone or part of a navigation system). The results of the MAPS&ADAS have already proven to be important for the Digital Maps Working Group, to which the project supplied the list of safety attributes and determined priorities. The survey for European safety attributes inventory (18 European countries) conducted within MAPS&ADAS is of high importance for the implementation of Phase 1 (Digital Maps Working Group recommendations). MAPS&ADAS also explored the safety attributes qualification scheme and associated business model to initiate work on Phase 2 (eSafety Digital Maps Working Group recommendations).

The SpeedAlert (www.speedalert.org) project's main objectives were to harmonise the in-vehicle speed alert concept definition and identify and investigate the first priority issues to be addressed at the European level, such as the collection, maintenance and certification of speed limit information. One of the most important recommendations defined by SpeedAlert addressed the crucial need to ensure procurement of European-wide and up-to-date speed limit information.

HIGHWAY (www.ist-highway.org) worked on the architecture and specifications to offer integrated safety and added-value services for both embedded in-vehicle and mobile personal navigation systems. The work included a user requirement analysis and the design of the global system architecture.

SafeMAP focuses on analysis of societal benefits of safety-related map data (in terms of improvement of road traffic safety) and the feasibility and cost of inclusion of such data in in-vehicle map databases.

FeedMAP has developed a framework that will easily detect map deviations based on information from only a limited number of vehicles and quickly update the maps of all other vehicles. The framework developed during the FeedMAP project has contributed to improved transport efficiency and increased road safety by creating a sustainable source of map updates at a reduced cost for in-vehicle navigation and safety (ADAS) applications. The concept of automatically using the information extracted from the user experience is today one of the prerequisites for more efficient, safer, and more comfortable driving experience.

Further research can be done on automatic collection of data using map data in the cars. Additional business scenarios should be investigated, especially for the implementation of ADAS-enabled maps on the market.

Cooperation between public authorities and private location-based content providers for the provision and maintenance of safety attributes is a key priority and is the major goal of the ROSATTE project, started in January 2008. It aims at establishing an efficient and quality ensured data supply chain from public authorities to commercial map providers with regards to safety related road content. ROSATTE therefore intends to develop the enabling infrastructure and supporting tools that will ensure European access to road safety attributes including incremental updates. This infrastructure will facilitate administrative internal functions as well as supply of data to third parties e.g. for safety relevant services. The overall requirements and architecture were finalised in September 2008 (available on www.rosatte.eu) and the consortium is now working hard specifications for data storage, data exchange and data integration. These are planned to be released during the first quarter of 2009. Testing should start in June 2009.

The PSF initiative is an industrial cooperative of car manufacturers, system suppliers and map suppliers. The objective of the initiative is the standardisation of a physical storage format for car navigation systems, opening new possibilities to compatibility, interoperability, flexibility and worldwide usability of the map data for car navigation systems. PSF will provide new features for car navigation systems. The "Update" of map data is only one of these features. Even though the PSF initiative does not specifically relate to safety attributes, due to the momentum of the involved companies it will quickly become a de facto standard and all extended attributes will need to be integrated into the developed format.

Contacts:

Mr Ad Bastiaansen, Road Group, ad.bastiaansen@roadgroupholding.com

Mr Lievin Quoidbach, Navteq, lievin.quoidbach@navteq.com

Mr Vincent Blervaque, ERTICO – ITS Europe, v.blervaque@mail.ertico.com

Mr Maxime Flament, ERTICO – ITS Europe, m.flament@mail.ertico.com

2.2.7 Emergency Calls (e-Calls) and E-112

Recommendation number and title[6]

12) Adopt the Commission Recommendation on the introduction and implementation of E-112 in Europe.

13) Establish a European Emergency Communications Forum to continue the CGALIES work.

14) For in-vehicle emergency calls (e-Calls), finalize standardization efforts for MSD, operating requirements (CEN) and transport/communication protocols/data bearer (ETSI), high-level application-protocol and quality of service standards (CEN). Develop guidelines to establish national roll-out platforms and form working clusters to exchange best practices and speed up implementation of both infrastructure and in-vehicle eCall systems. Agree on clear roll out timing.

Activity leader

European Commission, eSafety Forum

Introduction

These recommendations refer to the activities associated with the deployment of a pan-European Emergency Call System (eCall). The eCall Driving Group (ECDG) initially agreed on a roadmap[7] that should enable eCall to become a standard option on new vehicles type-approved after 1 September 2010 (Model Year 2011). Due to delays related to standardization and data transport protocols with still unclear timing as well as an industry lead time of three years to develop and integrate such systems the automotive industry is no longer in a position to accept the above timing but need to insists that eCall can only be made available as a standard option three years after all standardization and specification work is finalized and approved. It now seems that this standardization work might be finalized in the course of 2009.

The progress towards full deployment of eCall includes many steps for which deadlines have been set but revised now for the second time:

- All key stakeholders should sign the eCall Memorandum of Understanding (by end-2007, now delayed to end of 2008. Full emphasis on signatures from France and U.K. (not achieved)
- Full standardization incl. agreement on transport and communication protocols by end of 2008 (decision taken by ETSI in December 2008 but details still to be worked out until probably March2009). Operating requirements for public eCall currently in ballot process, which could last until May 2009. Operating requirements for Third Party eCall Services still under developing, no short-term solution expected.

[6] Recommendation 14 on eCall was updated by Dr. Wolfgang Reinhardt, ex co-chair of the eCall DG, to reflect the updated priorities and roll-up plan for eCall.
[7] Shifted forward by one year in the EC Communication COM/2006/0723 final "Bringing eCall back on track – Action Plan"

- Full specification of the eCall system and start of development (by mid-2007, now delayed to end of 2008, provided standardization work is finalized and approved () (further delays expected as final standards
- VIN Decoder project to be finalised by end of 2008 (done but questions of updating information not answered)
- Full-scale field tests to be performed (from the beginning of 2008, now delayed to end of 2008. (TELEFOT project has started but eCall part not yet covered, further delays expected to mid of 2009 or later depending on standardization progress)
- All Member States ready to start to upgrade their PSAPs by end of 2008. Full deployment should be ready 2 years after all specs and standards are finalized and approved. (Kick-off meeting for European Implementation Platform scheduled for 12 February 2009).

Monitoring the progress of these six recommendations will be done by comparing the progress with the deadlines set in the roadmap.

Monitoring the progress of these six recommendations will be done by comparing the progress with the deadlines set in the roadmap.

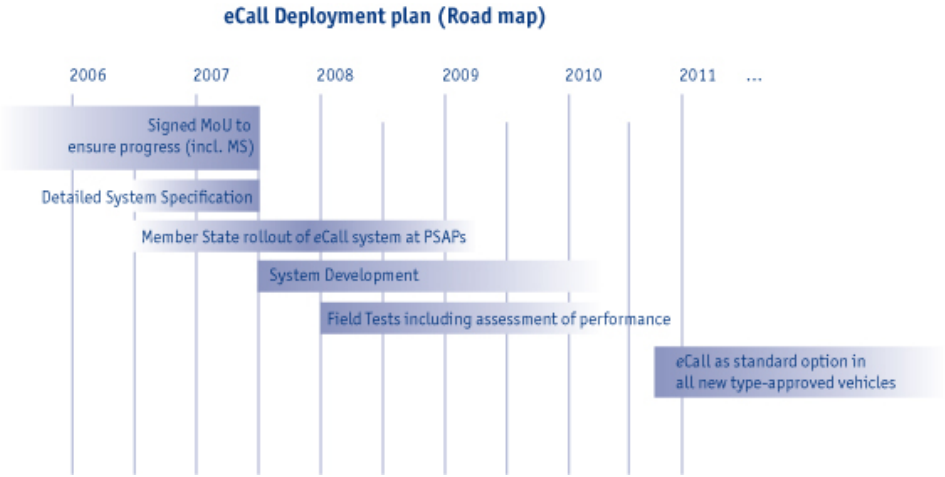

Figure 9 – eCall Roadmap

Indicator of progress of the recommendations

12, 13, 14) Level of fulfilment of the milestones of the eCall Road Map	The progress with respect to the abovementioned six actions and deadlines: *eCall MoU to be signed by all key stakeholders*: the new target set for 2007 was to have "15 Member States signing the MoU, including Germany, France and UK by mid-2007[8]". As of publication of this report, fourteen Member States plus three associated countries have signed the MoU but France (even under their presidency) and UK have still not signed. There are a number of countries like

[8] EC Communication COM/2006/0723 final "Bringing eCall back on track – Action Plan"

	Belgium, Luxemburg, Hungary, which have started internal processes to arrive at signing the eCall MoU but progress is slow. A new impulse is urgently required. *Full specification of the eCall system and start development*: the Transport Protocol (data bearer) was expected to be standardized at the ETSI MSG meeting of September 2007. However the report of the 3GPP on the analysed solutions indicates that existing solutions do not fulfil completely the eCall requirements. 3GPP suggested starting a second phase of analysis, where other no-standardised solutions are taken into account. EC has validated this suggestion and has officially asked 3GPP to proceed into this second evaluation phase. The results of this second phase have been provided by end of August 2008. Qualcomm has been selected as the technology leader by 3GPP SA4, reconfirmed at the 31 October meeting at ETSI and finally approved by end of 2008 3GPP will do the conformance testing in the 1 half of 2009. The MSD content was successfully voted upon on 11 January 2008 (revision made to include ASN.1 codes) and the standardisation process of the eCall Operations Requirements has also started within the CEN TC278 WG15. Several meetings were hold in the meantime to especially define the operating requirements for both public eCall and private eCall support services. The draft final version was agreed on 16-17 September 2008. European-wide approval processes will probably be finished by end of 2008 with some fine-tuning until mid of 2009. An eCall VIN decoder concept was successfully developed and tested based on the input from some manufacturers (not all) but learnt its deficiencies especially related to updating information in the future. The Third Party – eCall (TPS-eCall) operating requirement document is still under preparation (chair Mr. B. Flury-Herard, French Transport Ministry) and needs discussion with the PSAPs. It cannot be expected that PSAPS would accommodate several TPS-eCall services so that standardization is a requirement as well. Medium-term PSAPS expect one technology to maintain. Furthermore, the eCall Flag (eCall discriminator) is now included in the Release 8 TS 24.008 – V8.2.0 (2008-06) to allow identification of manual eCalls and automatic eCalls if desired. In addition a High-Level Application Protocol (5 months project given to CEN, currently call for experts) and a Quality of Service requirements for eCall and TPS (to be approved by CEN Plenary) needs to be developed. Work has not started yet but will proceed in 2009. The VIN Decoder projects was successfully carried out by end of 2008 but key issues remain with regards to completing the historic data and agree on an updating process for new vehicles.The special

	European situation allow flexibility in the VIN so that new type approved vehicles do not always follow a clear classification. This either requires a change in the VIN (all mandatory fields), the set up of a European VIN database or access to national databases either on company or public vehicle registration level. All difficult scenarios to implement. *Full-scale field tests to be performed from beginning of 2008*: the 2nd Call of FP7 opened in June 2007 includes the launch of Field Operational Tests (FOTs) for the eCall application. The FOT projects are expected to start before summer 2008, therefore FOTs will not be carried out before end 2008/beginning2009. This might be in line with the expected availability of final specifications and communication protocols. The TELEFOT project was approved and is in the phase of defining its work. The eCall part is not yet covered as standardization is still in process. *Member States to start upgrading PSAPs by September 2008 to finalize 2 years after all standardization work is finalized and agreed.*: the first results of FOTs will help Member States to understand the specific needs of the PSAPs for the eCall process. Therefore, the upgrading process could start quite quickly once the FOTs are launched and first results are available. Due to a quite fragmented European market with different starting positions it cannot be expected that all markets would be ready at that date. Therefore, it has been suggested to form national roll out platforms with all relevant stakeholders and then organize cooperation fora (platform clusters) to help with deployment. Kick-off meeting for the European Implementation Platform is scheduled for 12 February 2009.

Analysis of the progress

	Three main factors are still jeopardising the current progress towards the full eCall deployment: 1. The missing signature of the MoU from 2 major MS, France and UK. 2. Full specification of the eCall system (in terms of standardisation/protocols) is still missing. 3. The non-existence of a feasible business model to speed up deployment However positive progresses have been observed on these three issues. The signature of the MoU has now reached a "critical mass" level, with 14 signatures, which show that Europe is willing to commit to the eCall service deployment. Moreover the launch of national roll-out platforms and cluster building with exchange of best practices as well as FOTs will most likely encourage new

	signatures. Concerning the eCall full specification, despite concrete delays, the positive aspect is that MSD content has been standardized, an agreement has been reached to differentiate between public eCall and private eCall support services with dedicated operating requirements, and an important progress has been made for the transport protocol selection with the opening of the 3GPP analysis 2nd phase. The selection of Qualcomm in-band modem technology is a major step forward towards implementation. Concerning business models the acceptance of eCall as an option for new type approved vehicles three years after all standards have been agreed upon facilitates the development of an integrated eCall system but faster implementation could be reached when the current national recovery plans also include the promotion of upgrading the PSAP infrastructure and provide fiscal support for customer buying new cars with eCall.

Report on the progress of eCall recommendations

Current Status

The deployment of the in-vehicle emergency call (eCall) is a priority both for the industry and the public sector. In cases, where a vehicle is involved in an accident, an eCall can be initiated automatically or manually, and accurate vehicle location and additional safety-related information can be passed to the Public Service Answering Point (PSAP). Such information significantly cuts the emergency response times, which in return can save lives and reduce the consequences of serious injuries. eCall will use the single European emergency call number E112. In order to facilitate the processing of location-enhanced emergency calls, the EC adopted a Recommendation that further emphasises the need to take into account in-vehicle eCalls.

The eCall Driving Group was established at the end of 2002. By mid 2003, it had identified the key players involved in the eCall process (the automotive industry, the mobile telecommunication industry, the public emergency authorities and associated or cooperating service organisations, and the public social security organizations and private insurance companies). It also outlined the functionalities of the interfaces to be established between the players, which are members of four large "constituencies". The eCall Driving Group's Action Plan for Pan-European emergency services describes services, which will build on the location-enhanced emergency services implemented in the Member States on the basis of the recently adopted Recommendation on E-112 implementation. These services will also include provisions for more accurate location information and additional safety features.

In July 2005, 8 sub-working groups were created within the DG eCall DG to identify and solve some of the concrete issues related to the eCall implementation. The position papers from these sub-working groups have been the basis for DG eCall's overall recommendations for the introduction of the pan-European eCall. Covering eCall architecture, performance requirements, the definition of a Minimum Set of Data (MSD), certification and privacy issues, they were adopted by the eSafety Forum Plenary at its meeting in May 2006.

In its final report, DG eCall presented a revised roll out plan, whose realisation depends on the timely commitment of all stakeholders. This report, which also includes performance and quality criteria to be met when implemented, is available on the website: http://www.esafetysupport.org/en/esafety_activities/esafety_working_groups/emergency_call_ecall.htm.

Having recognised the absolute necessity that all eCall players agree on a common functional objective and schedule, DG eCall drafted a Memorandum of Understanding (MoU) in August 2004 that included the EC, ERTICO – ITS Europe, and ACEA as its first signatories. This MoU sets the objectives and outlines the route to complete the launch phase of eCall by 2009. Many other key stakeholders have followed from the private and public sector.

In addition, as of writing, fourteen Member States (Austria, Cyprus, Czech Republic, Finland, Germany, Greece, Italy, Lithuania, the Netherlands, Portugal, Slovenia, Slovakia, Spain, Sweden) and three Associated States (Iceland, Norway, Switzerland) have signed the eCall MoU, while the procedure for the signature has been started in other countries, with different status of advancement.

On 23 November 2006, the Commission adopted its third Communication on "Bringing eCall back on track". It presents an updated eCall Road Map (see Figure 9) and two actions that are crucial for making eCall a reality:

1. Member States have been given clear actions with deadlines for solving the remaining legal, technical and socio-economic issues and proceeding with the necessary 112, E112 and eCall infrastructures;
2. Industry is asked to renew its commitment to eCall. The EC has also startedand finalized negotiations with the associations of the automotive industry (ACEA< JAMA, KAMA) on a voluntary agreement for introducing eCall devices into vehicles (standard option for new type-approved vehicles after a certain cut-off date) A first meeting took place on 25 January 2008, a second on 7 March 2008.

The objective of having "15 Member States signing the MoU, including Germany, France and UK by mid-2007" contained in the Communication has not been achieved, since the MoU has thus far only been signed by fourteen Member States and only Germany signed it out of the three countries listed above (see Table 3). Luxembourg, Belgium and Hungary, have also announced their intention to sign.

United Kingdom, announced that they will not sign the MoU on eCall due to other priorities but have now initiated a new impact analysis as their first turn down was based on out-dated information. In France, an inter-ministerial group has been created to study eCall deployment in co-operation with the industry. France is supporting a proprietary in-vehicle emergency service based on a priority SMS concept. The Commission has started several attempts to convince the French government but without success.

Institutional and organisational issues are some of the reasons noted by other Member States for their delays in progress. Four Member States (Belgium, Estonia, Latvia, and Poland) have not reported on progress. Three Member States are planning studies, while ten Member States are either running or planning trials, including large-scale pilots. Based on their successful work and dedication thus far to the eCall cause, The Netherlands, Finland and Sweden are expected to be the first countries with operational eCall.

From the industry side, the automobile manufacturers have developed technical specifications for two possible solutions: a safely integrated mobile device-based and a basic vehicle-integrated solution. Moreover, an integrated eCall functionality has been proposed in an overall Telematics, Navigation or Tolling System.

In the meantime, nomadic navigation manufacturers have shown interest to integrate an eCall functionality in their devices.

ETSI, the European Telecommunication Standardization Institute (ETSI_MSG) and 3GPP evaluated a number of possible technical solutions to produce a recommendation for a common standard and communication protocol. At the ETSI MSG meeting of September 2007, results of this analysis were communicated: the analysed solutions do not fully comply with the current eCall requirements. 3 GPP suggested opening the second phase of the analysis, in which other solutions will be investigated. A lab test is planned for mid July to end of August 2008. Five possible candidates (Airbiquity, Qualcomm, RIM, and Ericsson, Nokia,) have originally stepped forward. At the end only the first three did participate in the test and spend the money. Results of the test were communicated in August 2008 with Qualcomm being the leading candidate to be measured against. This decision was confirmed in the December 2008 meeting of ETSI. Details will be worked out until March 2009.

In order to make strides in the analysis of the eCall's emergency management, the EC organised several workshops involving emergency management players. A PSAPs workshop discussing PSAP requirements in terms of performance of the system and contents of the eCall Minimum Set of Data (MSD) took place in March 2006 in Madrid. Several Service Providers (SP) meetings took place in 2006, 2007 and 2008 in Brussels, to define the SP role in the deployment of the eCall service. Major result of these meeting is a Working Document, which proposes SP/PSAP interfaces and data content to be included in the Full Set of Data (FSD). This document is expected to be further discussed and defined in cooperation with public PSAP during 2008. Up to now no results available.

PSAP Expert meetings took place on April 2007, November 2007, April 2008 and October 2008 in Brussels, which concluded that the EC will take action in collaboration with the vehicle manufacturers to promote a harmonised Vehicle Identification Number and the development of a VIN decoder suitable for PSAPs operation. The EC has transmitted the PSAP consensus on the MSD data to the CEN TC278 WG15 chair. A VIN Decoder software was developed by YGOMI but there are still issues with historic data (not all vehicle manufacturers contributed equally) and how to update the information in the future.

CEN TC278 WG15 reported that the CEN Plenary requested standardisation of the other eCall operational requirements, and not only the MSD content. The CEN WG15 convenor, Bob Williams, was provided with DG eCall's final recommendations and the WG15 is working on the standards discussed in July and November 2007 in Brussels. Two additional meetings took place in 2008 to now define the operating requirements for public and Private eCall Support Services. Results are still pending.

The definition of the content of the Minimum Set of Data has been completed early 2008. The promoted harmonisation of the VIN and the development of a VIN decoder suitable for PSAPs operation should help to solve the issue of having sufficient information in the VIN included in the MSD for extracting the vehicle information needed for the emergency services to handle the call (i.e. type, make, model and model year of the vehicle). Non mandatory information like energy type will need to be added as separate fields in the MSD.

In spite of a number of special meetings the EC has arranged with key stakeholders (insurance companies, telecoms and mobile network providers, emergency call service providers and public authorities), no agreement could be reached on a business model. This leads to the offer from the industry to introduce eCall as a standard option paid by the customer. The national governments can then still decide how to best promote the take-up of eCall in their respective country. The current financial crisis and the national and European recovery plans with significant investments in infrastructure provides an opportunity to also promote eCall implementation with financial incentives and investments in PSAP infrastructure.

Another open issue is the future role of the private service providers that currently offer emergency call services. In this context a major decision was taken by introducing a so-called "eCall flag" indicating clearly that the call is coming from a vehicle and not from a device outside the car. In this understanding a manual eCall triggered by an in-vehicle device has to be dealt with like an automatic eCall while pushing a button on a mobile (non-integrated) device is treated in a different way.

The EC will provide further assistance by working on privacy and standardisation, and public awareness campaigns as part of the Intelligent Car initiative within the Commission's i2010 strategy - a European Information Society for growth and jobs.

The Intelligent Car initiative found full support by the positive voting of the European Parliament in June 2008.

FP7's 2nd Call, opened at the beginning of June 2007, includes the launch of Field Operational Tests (FOTs) of the eCall application. However, concerns exist about the timing: due to delays in standardization FOTs can only be carried out now probably at the end of 2009 provided all standardization work has been finalized. At European level, eCall has been dealt with in the following research projects:

- eMerge (www.e-merge.org/)
- CGALIES (www.telematica.de/cgalies/index.html)
- GST RESCUE (www.gstrescue.org) (WR has non knowledge on the progress here)

One of the tasks within the GST RESCUE project was to investigate the implementation status of E112 in the Member States. This was done via a questionnaire sent out to the 25 Member States and the study was finalised in November 2004. GST RESCUE aimed to optimise the use of data from in-vehicle emergency call systems. Not only will in-vehicle emergency calls deliver such critical additional information as location and accident severity data to the dispatch centre as agreed by DG eCall, but the emergency vehicles themselves will employ a navigation solution and warning system permitting them to arrive safely on the scene as quickly as possible.

Table 3 - Member States having signed the MoU

	EU Member State	Address	Name	Position/Title	Date of signature
1	Ministry of Interior - General Directorate of Fire Rescue Service	Kloknerova 26, pošt. přihr. 69, post code CZ - 148 01 Praha 414	Maj-Gen Miroslav ŠTĚPÁN	Director General	18/09/2007
2	Federal Ministry of Transport, Building and Urban Affairs, Germany	Invalidenstrasse 44, DE-10115 Berlin	Mr Wolfgang TIEFENSEE	Federal Minister	5/06/2007
3	Gobierno de España – Ministerio del interior – Dirección General de Protección Civil y Emergencias	Calle Quintiliano nº 21, ES – 28002 Madrid	Mr Francisco Javier VELÁZQUEZ LÓPEZ	Director General	18/09/2007
4	Ministry of Transport and Communications Greece	2, Anastasseos Street GR-10191 Cholargos, Attiki	Mr Anastasios NERANTZIS	Deputy Minister	18/10/2005
5	Ministry of Innovation and Technologies, Italy	Via Isonzo, 21b, IT - 00198 Roma	Mr Settimio VINTI	Director	18/10/2005
6	Ministry of Communications and Works, Cyprus	28 Achaeon Street, CY-1424 Nicosia	Mr Harris THRASSOU	Minister	8/12/2005
7	Ministry of Interior - Lithuanian Emergency Response Centre	Svitrigailos str. 18, LT-03223 Vilnius	Mr Arturas KEDAVICIUS	Director	18/10/2005
8	Ministry of Interior & Kingdom Relations	Postbus 20011, NL-2500 EA Den Haag	Mrs Guusje TER HORST	Minister	8/11/2007
9	Federal Ministry of Transport, Innovation and Technology, Austria	Radetzkystrasse 2, AT-1030 Vienna	Mr Peter FRANZMAYR	Director	5/06/2007
10	Ministry for Public Works, Transport and Communications	Palácio Penafiel, Rua de S. Mamede ao Caldas, 21, PT - 1100-533 Lisboa	Mr Mário Lino SOARES CORREIA	Minister	18/09/2007
11	Ministry of Economy and Transport, Slovenia	Kotnikova 5, SI-1000 Ljubljana	Mr Matjaž JANŠA	Director General	18/10/2005
12	Ministry of Transport and Communications Finland	PO Box 31, FIN-00023 Government Finland	Mr Harri KAVÉN	Director-General	22/09/2004
13	Swedish Road Administration	SE-78187 Borlänge	Mr Ingemar SKOGÖ	Director General	20/06/2005

The following national activities on eCall took place in the Member States: (needs updating by the Member States)

- *Finland*: A consortium commissioned by the Finnish Ministry of Transport and Communications has produced a plan for a national eCall pilot. The plan concludes that aftermarket devices will enable more forceful and cost-efficient car fleet penetration than OEM eCall devices. The plan also includes an analysis of user requirements based on an interview study. The authorities will provide the system for the device manufacturers and vendors in order to already ensure its operation. In 2004, a test bench for data communication was implemented and a discussion paper promoting eCall was released (and later updated). In 2005, a study was published that estimated the impacts of an automatic eCall system on accident consequences in Finland. In 2006, the needs and views of the involved authorities concerning eCall implementation were clarified and matched. In addition, the changes and required development actions were determined. The aim of the study was to create a national eCall authority framework to which the operational authorities can commit.

- *Germany*: the German Federal Ministry of the Interior is planning the implementation of E112. The plan is to visualise the location of the incident both at the PSAP and in the emergency vehicles. ADAC ran a feasibility trial whose results were made public in June 2007.
- *The Netherlands*: the Ministry of Internal Affairs and Kingdom Relations made a plan for the implementation of E112 in 2006 that contains visualisation of incident location both at the PSAP and in the emergency vehicles. The automotive platform ADI was instituted in The Netherlands with the mission to institute one eCall platform in which public authorities (PSAPs and Ministry of Interior), service providers, and the automotive industry at large are represented. There will be a Service Level Agreement with this platform and the Ministry of Interior on how to operate eCall in The Netherlands using a triangular organisational concept of eCall – PSAP – service provider. One major element will be the creation of a central database with all automotive data on make, model, year and technical details. This will be accessible online via eCall to provide all necessary data on handling all types of vehicles in emergency service operation.
- *Czech Republic*: Both the Ministry of Transport and Ministry of Interior support an R&D project on eCall. The project aims to describe and test the functionality of PSAP centres. Tests were finalized in November 2007.
- *Austria*: A pilot project was initiated in 2006 to test the communication parameters and the necessary organisational structure for a future introduction of an efficient E112 call service. The areas of investigation were reliability of communication transmission and positioning, and acceptance for pricing

An "eCall toolbox", which detailed eCall information and reports, as well as the list of MoU signatories, can be found on www.esafetysupport.org/en/ecall_toolbox/.

Contacts:

eCall Helpdesk, eSafety Support, eCall@eSafetySupport.org

Mr Emilio Dávila Gonzalez, EC, Emilio.Davila-Gonzalez@ec.europa.eu

Mr Wolfgang Reinhardt, ACEA, wr@acea.be

2.2.8 Real-time Traffic and Traveller Information (RTTI) for road safety

Recommendation number and title:

15) Analyse the Member States' responses to the RTTI Recommendation and draw up further actions.

16) Create public-private partnerships to capture, process and provide real-time traffic, travel and road condition data including Floating Vehicle Data.

17) Support the wider use of the pan-European RDS/TMC network for safety-related traffic information. Provide a report with required actions to the European Commission on the status of RDS/TMC implementation and the remaining bottlenecks.

Activity leader

15) European Commission

16) Organisations across multiple sectors (industry, public bodies, motoring clubs)

17) TMC Forum (now activities have been absorbed into TISA, Traveller Information Services Association)

Introduction

These Recommendations refer to the deployment an RTTI system in Europe. Since their publishing, the wish and the activities within many Member States has grown considerably to establish - or extend – RTTI-services via RDS/TMC and install more of the necessary infrastructure for the collection of relevant traffic data.

The indicators below follow the progress of the Recommendations taking into account the new recommendations of the RTTI WG.

Therefore to measure the progress of this recommendation, two indicators are proposed, one taking into account the methodological aspect of the tests, the other tracking the actual tests being undertaken. Figure 3 shows the breakdown of the indicator.

Indicators of progress of the Real-time Traffic and Traveller Information (RTTI) for road safety recommendations

15.1) RTTI (TMC) coverage in Europe	There is an increasing number of overall services, but no aggregated data of their coverage is publicly available. Examples can be given for Italy - 80% geographical coverage and 90% traffic flow coverage with new service, and Finland - coverage of all major interurban roads and some city centre areas. A detailed survey of RTTI coverage in the EU is available on the market for purchase, compiled by the company SBD.

	New additional / changed services are now available in: • Finland - change to higher performance (but conditional access so reduced accessibility) private service • Italy - moved to Conditional Access service • Czech Republic - implementation is in test stage. Service implementation beyond Europe also continues (e.g. Australia), underlining the support for the technology. TISA has launched a survey of TMC location table providers worldwide in order to produce an up-to-date service overview.
15.2) Drafting/Adoption of a common implementation strategy for the geographic extension of RTTI services, working to European standards	There is a proposed process in RTTI WG report. Guidelines are also available in the TMC Forum's 'Bringing TMC to New Markets' brochure. TMC is fully ISO / CEN standardised and mature, with revisions to the 14819 series currently in preparation by TISA for standardisation. TPEG's initial set of standards are complete through ISO / CEN, and TISA work includes development of additions and updates, also to be provided for standardisation.
15.3) Actions to ensure roaming and inter-operability of RTTI services across the EU with clearly defined accessibility to services for roaming devices	Roaming and inter-operability were highlighted in the RTTI WG report and considered in the design of new RTTI technology. Introduction of Conditional Access (paid) services replacing previous free services can harm service accessibility for existing users if alternative provision is not made when free services are turned off. Patchy availability of digital radio broadcast inhibits consistent international and cross-border access to advanced TPEG RTTI services.
16) Creation of PPPs to capture, process and provide real-time traffic, travel and road condition data	The TMC Forum brochure on new TMC implementation described possible business models and benefits / drawbacks of different scenarios. Governments need to commit funding to projects if they want to control the systems and services developed. The Public element of such PPPs needs to safeguard business model and technical decisions to ensure they support accessibility and roaming.
	The CONNECT Euro-Regional Project 2004-2007 (among other activities) supported the introduction of TMC in selected new EU25 Member States. The SIMBA project and now the SIMBA II initiative,

17.2) Action supporting the wider use of the pan-European RDS/TMC network for safety-related traffic information	bring together the EU and the nations of Brazil, China, India, South Africa and Russia, to consolidate an international cooperation network that aims to increase road safety, mobility and transport efficiency. This includes fostering deployment of technologies such as TMC in these countries. The EasyWay project identifies TMC and other RTTI such as TPEG as key services for supporting mobility across Europe and aims to support deployment, particularly cross-border issues. TISA works on development and standardisation of new features for TMC, following requests from industry and public authorities, on an ongoing basis. TISA also works on development and standardisation of TPEG (Transport Protocol Expert Group) framework and travel information applications using digital bearers. The TMC Forum's brochure gives a basic explanation of the process of bringing TMC to a new country or area, and TISA continues to support these activities. The international standards published for TMC are ISO / CEN 14819 Parts 1 (Coding protocol for RDS-TMC using ALERT-C), 2 (Event and information codes for RDS-TMC), 3 (Location referencing for ALERT-C), and 6 (Encryption and conditional access for the RDS - TMC ALERT C coding). The international standards published for TPEG are ISO / CEN 18234: Traffic and Travel Information (TTI) -- TTI via Transport Protocol Expert Group (TPEG) data-streams, parts from 1 to 6 (Introduction, numbering and versions; Syntax, Semantics and Framing Structure (SSF); Service and Network Information (SNI) application; Traffic Message (RTM) application; Traffic Message (RTM) application; Public Transport Information (PTI) application; Location referencing applications), and 24530: Traffic and Travel Information (TTI) -- TTI via Transport Protocol Experts Group (TPEG) Extensible Markup Language (XML), parts from 1 to 4 (Introduction, common data types and tpegML; tpeg-locML; tpeg-rtmML; tpeg-ptiML). Further international standards for TPEG are in development but not yet published: • ISO / CEN 18234-7 - Parking Information (PKI) application • ISO / CEN 18234-8 - Congestion & Travel Time (CTT) application

	• ISO / CEN 18234-9 - Traffic Event Compact (TEC) application • ISO / CEN 18234-10 - Weather Information (WEA) application Parts 7-10 are all at ISO stage 10.99: 'Proposal stage; New project approved'
17.2) Report to the European Commission on the status of TMC implementation and bottlenecks	TISA maintains a website section showing implementation status for countries worldwide and has launched its new website with TMC and TPEG implementation news features. (www.tisa.org) The RTTI WG prepared a report to support the Recommendations and it was presented during the eSafety Plenary Forum meeting and German Presidency event.

Analysis of the progress

	Increasing implementation and coverage of TMC, plus development progress in TPEG with a first service launched in UK during 2008. Non-profit organisation **TISA provides enhanced cooperation between technologies and support for a single coherent development plan**. Where new Conditional Access (privately run, paid access) TMC services are introduced to replace public services, quality is often increased **but accessibility can be strongly reduced** and this will continue to be the case if governments do not take the required steps to support free services. In MSs where clear d**igital broadcast infrastructure plans are not in place**, deployment of advanced TPEG services will be delayed.

Report on the progress of Real-time Traffic and Traveller Information (RTTI) for road safety recommendations

Current Status

Real-time traffic and travel information (RTTI) can contribute greatly to safety. In order to facilitate access to public sector data, and enable the private and public sectors to co-operate in the service provision, the EC published in 2001 a Recommendation on the deployment of traffic and travel services in Europe. RTTI is the first area of a new generation of telematics services for drivers and other travellers to achieve appreciable success. Currently, this is due to the fast-growing implementation of services and products based primarily on existing RDS-TMC broadcast technology.

In the future, supplementary technologies such as digital bearers will enhance the service possibilities - 2008 sees the first launches of TPEG services over DAB. By delivering traffic data messages promptly to a suitable in-vehicle terminal, TMC and TPEG upgrade static navigation to real-time, i.e. dynamic route guidance, or "electronic traffic avoidance" while giving safety benefits by alerting drivers to accidents, congestion and hazardous driving conditions.

Floating Vehicle Data, 'Floating Phone Data' (GSM network-based telephone location) and other advanced data collection techniques are now being used to support high quality TMC services. Public/private partnerships help increase the use of these techniques.

RDS-TMC receiver deployment has reached mass market status thanks to its relationship with navigation systems, particularly the booming Personal Navigation Device market. The Traveller Information Services Association (TISA) continues to support wider use of RDS-TMC through assistance for new and existing EU Member States and organisations. It offers:

- Advice on all aspects of setting up TMC services
- Harmonisation, standardisation and quality assurance, e.g. certification of Location Tables
- Development work to implement new features to improve services.
- Development work on advanced TPEG services for digital bearers such as DAB, DVB and DMB.

The use of higher-bandwidth communication media (such as terrestrial or satellite DAB) and the results of research initiatives such as AGORA (pioneering on-the-fly location referencing) and TPEG (new protocols extending the message set and supported applications) can help broaden the capability for future RTTI services.

The first service trials using TPEG-based technology, started at the end of 2006, formed an important step in bringing this new technology closer to market. The first limited commercial services began to broadcast in the UK at the end of 2008.

Several current and recent European projects support the actions proposed by the RTTI recommendations:

- CONNECT Euro-Regional project which (among other activities) supported the introduction of TMC in selected new EU25 Member States.
- DYNASTY (Europe-Aid framework) demonstrated TMC in China and promoted its adoption, leading to current service deployment work in China
- Mobile.info (German industry-led but wider applicability) developed TPEG-based RTTI service supporting dynamic navigation. The project delivered its output to TISA to support wider standardisation and deployment work.
- TISA (Traveller Information Services Association), a non-profit organisation hosted by ERTICO and formed in order to leverage synergies of TMC and TPEG forums and technologies for a coordinated market development:
    - working on development and standardisation of new features for TMC, following requests from industry and public authorities, on an ongoing basis

- working on development and standardisation of TPEG (Transport Protocol Expert Group) framework and travel information applications using digital bearers

National activities centre around introducing TMC to new markets not only in Europe but worldwide, introducing more advanced traffic information collection methods and trialling RTTI over digital bearers. Examples include:

- Taking TMC from trial to full commercial service status in Finland
- Commercial service development and launch in USA
- Commercial service development and launch in Australia and New Zealand
- Service demonstration and commercial service development in China
- Commercialisation and upgrade of existing TMC service in Italy
- Commercial service launch in Belgium
- Development of TMC service for Andorra
- Development of TMC service for Czech Republic
- Development of TMC service for Slovakia
- Ongoing maintenance of existing services and improvement with extra locations supported across many countries (e.g. UK, Germany, France)

The RTTI Working Group, following 2001's EC Recommendation on the deployment of traffic and travel services in Europe, has provided further analysis and recommendations for accelerating the take-up of the measures for accessing the public sector data, enabling the establishment of public-private partnerships, and the provision of reliable, high-quality RTTI services in Europe. The WG has produced a technical and economical model for implementing RTTI services. It recognised that the only viable short-term solution is RDS/TMC, while other technologies will offer higher quality services in the future.

The RTTI WG ended its work in 2005 and made its final results public at the 2nd eSafety High Level Meeting in October 2005. Among the recommendations to Member States:

- An agreement on an implementation strategy for the extension of RTTI services working to European standards is needed
- Support the TMC Forum is encouraged
- There should be a minimum quality for public services
- Clear guidelines for the private sector should be published on the conditions for establishing private data collection networks for commercial vehicles, and
- The frequency spectrum and broadcast capacity should be made available in the near future and support the development of future advanced digital services.

Since then, further development in the field of RTTI has taken place, but open issues remain with respect to implementation, recommended measures and further roll-out.

In May 2006, the eSafety Forum welcomed the re-launch of the RTTI WG activities. Its revised objectives wereto:

- Review the results and recommendations of the Final Report and analyse the open issues
- Focus on traffic related criteria, expectations, and needs
- Propose a "Road Map" for the implementation of RTTI
- Propose further actions to the EC

The WG generated an updated set of recommendations including input from a public consultation. After consolidating the comments, it updated the RTTI recommendations in order to present them as a Final Report to the eSafety Plenary Forum meeting and German Presidency event.

The ITS Action Plan and EasyWay project are key current initiatives which have identified the importance of supporting RTTI development and deployment. Future actions for deployment include:

- Work to take advantage of the RTTI possibilities offered by the availability of new broadcast data bearers such as digital radio.
- Work to improve quality of service in urban and cross-border areas.
- Continuing work to optimise and manage the quality of existing services.
- Support in introduction of TMC services to new markets (e.g. Eastern Europe and China).

TISA is engaged in coordinating and supporting these actions among public and commercial stakeholders. Member State support for digital broadcast deployment is critical for widespread implementation of advanced services using TPEG to deliver a wide range of high quality RTTI and other traveller information services.

Contacts:
Traveller Information Services Association: Mr James Burgess, TISA Executive Office, hosted by ERTICO – ITS Europe, Avenue Louise 325, 1050 Brussels.
j.burgess@tisa.org / www.tisa.org

2.2.9 Motor vehicle type-approval legislation

Recommendation number and title

18) Determine what actions may be required for bringing rapidly forward road safety improvements obtainable with intelligent integrated road safety systems in vehicles.

Activity leader

European Commission

Introduction

In order to permit the introduction of Intelligent Vehicle Safety Systems or even mandate them, if appropriate, the motor vehicle type approval legislation should be adapted, when necessary. In the first eSafety Communication of September 2003 (COM(2003)542), the EC committed itself to review the existing EC vehicle type-approval legislation, determining what legislative actions may be required to bring forward road safety improvements obtainable with IVSS.

Consequently, the selected indicator monitors the EU-level Regulations released to adapt the current vehicle type approval legislation and therefore permit the introduction of such systems.

Indicator of progress of the recommendation

18) eSafety systems for which legislative instruments have been released to permit their introduction	Heavy duty vehicle blind spot and conspicuity marking have been introduced in type approval legislation to become mandatory in Europe. No further specific amendments to current regulation preventing specific eSafety Systems being brought to the market have been introduced thus far. No specific regulatory instrument for making some of the eSafety Systems compulsory has been introduced thus far (but activities have been started). The activities which are already started aim at replacing Directives by UN ECE Regulation, will mandate ESC for all vehicle categories as of 2011/2012 and will mandate at a later stage AEBS (Advanced Emergency Braking Systems) and LDWS (Lane Departure Warning Systems) for trucks. The Commission also acceded to the Installation of Lighting Legislation in Geneva as such mandating DRL for vehicles within the next 3 years. The United Nations Economic Commission for Europe approved a regulation allowing the EU to make ESC a mandatory

	requirement by reference, having vehicles to be fitted with an ESC system meeting an agreed specification (starting from heavy truck/trailer combinations and touring coaches). The European Commission has started a process to make Electronic Stability Control mandatory, from possibly 2010 onwards. The European Commission has issued a proposal stating that passenger cars need to be fitted with Brake Assist Systems (BAS) as early as 2009.

Analysis of the progress

	The EC has started a process to make Brake Assist Systems and Electronic Stability Control mandatory in the next years. Activities within public policy and regulatory framework have been started for other applications that regulation might become feasible, such as basic blind spot monitoring and conspicuity systems, daytime running lights, run flat indicators, seat belt reminders, and alcolocks for drunk driving violators.

Report on the progress of motor vehicle type-approval recommendation

Current status

In 2006, the High Level Group of the CARS 21 initiative, whose aim is to identify complementary and consistent policies that enhance economic competitiveness, road safety and the environmental performance of vehicles, issued the paper "Competitive Automotive Regulatory System for the 21st Century", containing recommendations for the public policy and regulatory framework for the European automotive industry. The Group recognised that processes including vehicle approval have to play their part in ensuring that losses on Europe's roads are reduced.

The group recommends that the EC should come forward with proposals on Electronic Stability Control, seatbelt reminders, brake assist systems, improvement of heavy duty vehicle blind spots and conspicuity, Isofix child seats and daytime running lights. It also notes that several active safety technologies, such as obstacle recognition systems, are at an advanced development stage. Thus their development and market introduction should be pursued as fast as possible.

Based on the above, heavy duty vehicle blind spots and conspicuity marking are already being introduced in type approval legislation. The EC has also started a process to make Electronic Stability Control mandatory, and activities have been launched for other applications in which regulation might become feasible, such as day-time running lights, brake assist (as part of pedestrian protection systems), run flat indicators, seat belt reminders, and alcolocks for drunk driving violators.

The Group, while stressing the possible EU role in promoting better enforcement, education and infrastructure planning, acknowledges that responsibility for the implementation of several infrastructure and user-related measures rests with the Member States.

Current and to-be European type approval directives will then get a global dimension by transferring them to the United Nations Economic Commission for Europe (UN-ECE) regulations.

Against the background of the increasing significance of advanced driver assistance systems for road traffic, their potential for improving road safety, the crucial importance of user take-up for market penetration, the investment already made in the development and the need to ensure effective cross-border transport and uniform conditions of market access in the EU Member States, the June 2007 eSafety Conference in Berlin addressed the regulatory framework for the implementation of ADAS. It reached the following conclusions:

1. The introduction of ADAS that intervene in driving manoeuvres or influences operation of the vehicle via the driver's behaviour raises numerous legal issues with regard to the responsibility of the various stakeholders (manufacturers, road users, infrastructure managers). National traffic law systems in Europe take as their starting point – based, among other things, on the principles of the Convention on Road Traffic (especially Articles 8 and 13) and past technology – that responsibility and liability for driving lies entirely with the driver. Clarity among the stakeholders regarding the regulatory framework is a requirement for successful commercialization.
2. The legal systems of the EU Member State cover without difficulty those ADAS that do not question the driver's full control over his vehicle. These are systems that optimise functions initiated by the driver (e.g. ABS), provide information or recommendations (e.g. speed alert) or systems that can be overridden or adjusted (e.g. adaptive cruise control).
3. The legal systems also cover without difficulty those non-overridable ADAS whose intervention has the same effect as customary vehicle performance limits (e.g. HGV speed limiters). They also cover those systems which intervene in situations when the driver might not be able to properly perform his/her driving task in a timely manner and the intervention keeps with the wish of the driver (e.g. ESC, automatic emergency braking).

4. When ADAS are being developed, care should be taken to ensure that the driver's control of his/her vehicle is not impaired. In general, there will then be no special liability risks. The principles developed in the RESPONSE 3 research project could be taken as a basis in order to make the implementation of this requirement in the development of ADAS manageable. They could thus help to minimize technological development risks, thereby de facto reducing liability risks. Observation of the functional performance of intervening ADAS in actual traffic – for instance within the framework of regular vehicle inspections or product observation – can make a further de facto contribution to minimizing liability risks and the take-up of the systems by detecting and, if necessary, correcting errors below the systemic performance limits. In addition, clarification of the scope of the principle of vehicle controllability in the Convention on Road Traffic could support legal clarity and further help to ensure comprehensive cross-border road transport.

5. ADAS that intervene to drive the vehicle against the driver's will as long as he/she can perform his/her driving task are not advisable. Such ADAS would have unforeseeable legal implications. Should such ADAS still be considered, the regulatory framework would have to be fashioned in such a way to provide legal certainty. This also applies if systems are to be made possible that trigger specific driving functions beyond the information function on a telematics basis (by communication with the vehicle).

6. When introducing any ADAS, care must be taken, by means of appropriate precautions during its development, to ensure that the systems are protected against improper use, abuse and manipulation. Efforts being undertaken by the European Commission, which has now also addressed the issue of eSecurity as part of the eSafety initiative, are welcomed.

7. Along with passive safety, the impacts of ADAS that promote road safety and the compliance within the limits of vehicle control by the driver should be taken into account when carrying out objective safety assessments of motor vehicles that should be based on accident data.

Contacts:

Mr Juhani Jääskeläinen, European Commission, INFSO-eSafety@ec.europa.eu

http://www.europa.eu.int/information_society/programmes/esafety/index_en.htm

2.2.10 Safety systems standards and regulation in the EU: State of the art

Recommendation number and title

19) Analyse specific needs and priorities of intelligent integrated safety systems for standardisation in ISO, CEN and ETSI. Promote accelerated standardisation.

Activity leader

Standardisation bodies

Introduction

Several standardisation issues are already emerging in other Recommendations. The proposed indicators try to summarise the different standardisation needs already analysed, and the achievement of a final standardisation for these areas. This work represents a primary analysis of the standardisation, since the topic needs a conspicuous effort for collecting and organising the material from the eSafety Working Groups. Furthermore, for several topics it was difficult to have access to the information. Therefore this analysis is not complete and will be enlarged in the next report.

Indicator of progress of the Recommendation

19.a) Topics currently matter of discussion at standardisation level	Refer to the report below.
19.b) Approved standards	Standardisation work for HMI has already been carried out in the relevant ISO standardisation group on assessing visual load and interruptability with the occlusion technique (ISO 16673 - Road vehicles — Ergonomic aspects of transport information and control systems — Occlusion method to assess visual demand due to the use of in-vehicle systems). It achieved good consensus and has been published as a full ISO standard. Currently, Lane Change Test is being standardised. It allows measuring the effect of driver distraction caused by in-vehicle information and communication systems on driving performance.

Analysis of the progress

	A new Technical Committee for Intelligent Transport Systems (TC ITS) was created in ETSI. TMC and TPEG Standardisation work was achieved. HMI issues are partially covered. Although several progresses were done in 2007, bottlenecks are still present for the eCall standardisation.

Report on the standardisation recommendation

Current Status

The EC supports both the work of the standardisation bodies and the industry's collaborative groups and open platforms.

The standardisation bodies active in ICT and ITS are ISO, IEC and ITU at international level, and CEN, CENELEC and ETSI at European level.

In 2007 the European Telecommunications Standards Institute (ETSI) created a new Technical Committee for Intelligent Transport Systems (TC ITS). This step was necessary to cope with the increasing importance of ITS and ETSI's responsibility as the leading European Standardisation Organisation for information and communications technologies. The meeting approved a structure of 5 working groups which covers all aspects of communication systems standardisation required for ITS service provision:

1. User and application requirements
2. Architecture and cross-layer issues, Web Services
3. Transport and network layer
4. Media and Medium related
5. Security

All working groups are set to meet in the first quarter of 2008, when they will define their terms of references and elect a chairman. The working groups are mainly dealing with items that are transferred from the TC ERM TG37, which has its focus on ITS spectrum matters, as well as CEN DSRC and CALM test specifications. However, the focus of the new TC ITS goes beyond these topics and several new work items have already been approved.

Related to car to car/infrastructure communications for road safety applications, two new work items were proposed with support of the CAR 2 CAR Communication Consortium. One deals with the specification of a network protocol for ad hoc routing in vehicular environments considering concepts of geographical addressing and using multi-hop communications, and the second one aims on the specification of mechanisms and protocols for secure and privacy-preserving communication in vehicular environments.

The second TC ITS meeting is planned for 10-11 April 2008. Further information and the schedule for the working group meetings are available on the ETSI portal (http://portal.etsi.org).

The Technical Committee 204 of ISO (ISO/TC204) is responsible for the overall system and infrastructure aspects of transport information and control systems (TICS). It is also in charge of the coordination of the overall ISO work programme in this field, including the schedule for standards development that takes into account the work of existing international standardisation bodies. Various working groups deal with different topics of related to eSafety: architecture, RTTI, route guidance and navigation systems, and short range communication.

The mission of WG1 is to provide ISO TC204, its Working Groups, related bodies, and those involved in the TICS sector with a reference model of Conceptual Reference Architecture(s) that shows the structure and interrelationships of the sector. It also aims to provide timely and appropriate definitions of Terminologies by means of glossaries and dictionaries, which explain, in plain language, the terms in use in TICS.

WG10 is concerned with the timely delivery of accurate, relevant, user-friendly information to travellers. This encompasses the broad range of travel modes in urban, inter- urban, and rural transportation. Travellers should have easy access to complete information about their travel alternatives and accurate information on current and expected travel conditions to enhance their mobility.

WG11: Route Guidance is looking at driver orientation and gives route recommendations on how to reach a destination. The systems may also consider the actual traffic situation in providing route recommendations and can also make recommendations regarding alternate travel modes. When routes are generated in the infrastructure, the in-vehicle system receives the calculated routes via a communication link. Work items of WG 11 are aimed primarily at motorised individual drivers. In Locally Determined Route Guidance, route search and resulting route recommendations are generated in-vehicle, using locally stored map (road network data). The communication interface is to be harmonized between locally determined route guidance and dynamic TICS information. In Centrally Determined ROU Guidance, all necessary information for route search and resulting route recommendations are generated in a traffic control centre (e.g., by using historical link journey times supplemented by real-time traffic information data) and subsequently transmitted to the individual driver.

WG14 is occupied with the standardisation devices of systems that contribute to avoiding crashes, increasing roadway efficiency, adding to driver convenience, and reducing driver workload. It also looks at improving the level of travelers' safety, security, and assistance by using information about the driving environment to perform the monitoring of the driving situation, warn of impending danger, advise of corrective actions, partially or fully automate driving tasks, report travelers' distress and request necessary emergency services such as medical, police, fire, and repair. Information about the driving environment can come from sensors on-board the vehicle, from other vehicles, and/or from the infrastructure. The driving environment includes all external factors that affect the vehicle or its driver including traffic, weather, and road surface conditions.

WG15 dedicated Short-Range Communications (DSRC) investigates the data exchange between roadside stations (e.g., beacon, interrogator, leakage coaxial cable) and vehicles if equipped with on-board-unit (OBU). DSRC is able to support many TICS applications already identified by ISO/TC 204 and thus will be an essential element of TICS. ISO/TC 204/WG 15 has been constituted to propose a common air interface standard for DSRC-link.

WG 16's area of focus is the wide area data exchange between control centers and user devices in support of TICS applications. It will initially concentrate on message structure and protocol specifications independent of communication medium (e.g., subcarrier technologies, cellular, PCS, satellite, SMR) and not define application data elements. It will also serve as a coordinator of message lists provided by the application-oriented Working Groups, promoting consistent use of data element structures across application messages, as a catalogue of unique message types, and as the definer of the general message structure for wide area communications media appropriate for TICS.

ISO/TC22, the technical committee 22 of ISO, deals with all questions of standardization concerning compatibility, interchangeability and safety, with particular reference to terminology and test procedures (including the characteristics of instrumentation) for evaluating the performance of road vehicles. In particular, the subcommittee 13 (ISO/TC22/SC13) works on HMI (ergonomics applicable to road vehicles), with issues related to location of hand controls, indicators and tell-tales in motor vehicles, ergonomic aspects of transport information and control systems, and simulated lane change test to assess driver distraction.

CEN/TC 278 Road Transport and Traffic Telematics, established in 1991, looks at the standardization issues to be applied to road traffic and transport, including those elements that need technical harmonisation for intermodal operation.

The three European standards organisations have also formed a collaborative body called the ICT Standards Board (ICTBS), and the public and private organisations dealing with road transport have formed ISTSG, the Intelligent Transport Systems Steering Group.

The EC is an observer in ICTBS and a member of ISTSG. It has also issued the following standardisation mandates to the European Standardisation Organisations: M329 – standardisation of the 24 GHz UWB SRR, M338 – drawing up a work programme to support the EFC Directive, M270 – calling for work programme for standardisation for ITS in road transport.

The ITSSG Strategic Framework document was finalized in November 2004 and updated in 2006 (available for download at www.itcsb.org). Specifically for eSafety, the EC is responsible for mapping eSafety areas onto standardisation requirements.

The standard requirements collected so far from the different eSafety working groups are the following:

Human Machine Interaction with increasingly more complex in-vehicle systems is a major concern. To tackle this important issue, in 2000 the EC published a Recommendation on Safe and Efficient In-vehicle Information and Communication Systems: a European Statement of Principles (ESoP) on human machine interface, which has been welcomed by the industry. The HMI Working Group of the eSafety Forum assessed the technical progress in collaboration with the industry and the Member States, and proposed a series of further measures on HMI in its final report issued in 2005. The EC acted swiftly on one of the recommendations and formed an Expert Group to update the European Statement of Principles (ESoP) on HMI. A new version of the ESoP was drafted and reviewed prior to being sent to the EU Member States, the European Parliament and the European Council.

The ESoP summarises a list of standards and standard documents in preparation referring to HMI:

- ISO 3958 Road vehicles – Passenger car driver hand control reach
- ISO (DIS) 11429 Ergonomics – System danger and non-danger signals with sounds and lights
- ISO 4513 (2003) Road vehicles - Visibility. Method for establishment of eyellipse for driver's eye location
- ISO 15008 (2003): Road vehicles – Ergonomic aspects of transport information and control systems – Specifications and compliance procedures for in-vehicle visual presentation
- ISO 15005 (2002): Road vehicles – Ergonomic aspects of transport information and control systems – Dialogue Management principles and compliance procedures
- ISO 17287 (2003): Road vehicles – Ergonomic aspects of transport information and control systems - Procedure for assessing suitability for use while driving
- ISO 4040 (2001): Road vehicles - passenger cars - location of hand controls, indicators and tell-tales
- ISO 15006 (2004): Road vehicles – Ergonomic aspects of transport information and control systems - Specifications and compliance procedures for in-vehicle auditory presentation
- ISO/TS16951 (2004): Road Vehicles – Ergonomic aspects of transport information and control systems - Procedure for determining priority of on-board messages presented to drivers
- ISO 15007-1 (2002): Road vehicles – Measurement of driver visual behaviour with respect to transport information and control systems – Part 1: Definitions & parameters
- ISO TS 15007-2 (2001): Road vehicles – Measurement of driver visual behaviour with respect to transport information and control systems – Part 2: Equipment and procedures
- ISO FDIS 16673: Road vehicles – Ergonomic aspects of transport information and control systems - Occlusion method to assess visual distraction

- ISO 2575 (2004) – Road Vehicles – Symbols for Controls, Indications and Telltales
- ISO 7000 (2004) – Graphical symbols for use on equipment - Index and synopsis

The principles of the ESoP constitute the minimum set of requirements to be applied. They can be reinforced by national legislation or by individual companies and therefore call for further regulations and standards, which should be taken into consideration as soon as possible - especially for the quickly growing nomadic device sector. The ESoP encourages industry to promote these principles at both the international and standardisation levels.

The three most crucial issues for **eCall** standardisation are:

1. A *standardidsed single emergency telephone number for the European Union*: the EC already defined 112 as the single emergency number for Europe.
2. The *definition and format of the minimum set of data (MSD)*: the definition of the MSD was done by the eCall In-Vehicle-Functionality Working Group (ECIV) and was published by DG eCall in May 2006. The MSD content has been successfully voted upon by 11 January 2008 and the standardisation process of the eCall Operations Requirements has also started within the CEN TC278 WG15. The final meeting is planned for 5-6 February 2008. European-wide approval processes will probably be finished by end of 2008
3. The *transport protocol* by which the MSD will be sent via the mobile telecommunication network (e.g. GSM) to the public service answering point (PSAP): the EC gave a mandate to ETSI in 2005 to standardise the necessary eCall transport protocol. Due to the ongoing technical discussions on the eCall system requirements (e.g. SIM necessary or not), technical work has been delayed for some time. To ensure the functionality of eCall in the future, the transport mechanism for the MSD needs to be defined not only for GSM, but also for UMTS-networks. Therefore, the technical task was forwarded to 3GPP SA. In September 2006, a work item for the standardisation of an eCall in-band modem was finally approved by 3GPP SA4, the system architecture working group in which the technical work will be carried out. As this modem will not really affect GSM/UMTS standards, it was decided to publish the eCall in-band modem procedures and algorithm as a technical report. The Transport Protocol was expected to be standardised at the ETSI MSG meeting of September 2007. However the report of the 3GPP on the analysed solutions indicates that existing solutions do not fulfil completely the eCall requirements. 3GPP suggested starting a second phase of analysis, where other no-standardised solutions are taken into account. EC has validated this suggestion and has officially asked 3GPP to proceed into this second evaluation phase. The results of this second phase are expected by mid-2008.

The international standards published for **TMC** are ISO/CEN 14819: Traffic and Traveller Information (TTI) -- TTI messages via traffic message coding

- Part 1: Coding protocol for RDS-TMC using ALERT-C)
- Part 2: Event and information codes for RDS-TMC)

- Part 3: Location referencing for ALERT-C), and
- Part 6: Encryption and conditional access for the RDS - TMC ALERT C coding.

The international standards published for **TPEG** are ISO/CEN 18234: Traffic and Travel Information (TTI) - TTI via Transport Protocol Expert Group (TPEG) data-streams:

- Part 1: Introduction, numbering and versions
- Part 2: Syntax, Semantics and Framing Structure (SSF)
- Part 3: Service and Network Information (SNI) application
- Part 4: Traffic Message (RTM) application
- Part 5: Public Transport Information (PTI) application
- Part 6: Location referencing applications)

and ISO/CEN 24530: Traffic and Travel Information (TTI) - TTI via Transport Protocol Experts Group (TPEG) Extensible Markup Language (XML):

- Part 1: Introduction, common data types and tpegML
- Part 2: tpeg-locML
- Part 3: tpeg-rtmML
- Part 4: tpeg-ptiML.

At the European research level, the Integrated Projects GST and PReVENT have substantial work packages in standardisation and also foster the development of open platforms and system architecture.

GST, which concluded in February 2007, aimed at an open telematics platform and collaborated with such industrial groups as OSGi Alliance, AMI-C, Open GIS and MOST Co. The GST sub-projects used and extended the existing standards, extracting amendments to submit to standardisation bodies. A detailed report[9] was released in June 2007.

The PReVENT subproject RESPONSE 3 elaborated a European Code of Practice (CoP) for an accelerated market introduction of Advanced Driver Assistance Systems (ADAS). Even if it does not aim at defining a specific standard, the CoP will help manufacturers to "safely" introduce new safety applications through an integrated perspective on human, system and legal aspects. The principles of the CoP could eventually evolve into a standard without additional workload.

The Integrated Project CVIS is also working in the standardisation area and adopting the CALM standards for V2I communication.

Contacts:
Mr Paul Kompfner, ERTICO – ITS Europe, p.kompfner@mail.ertico.com

[9] An external view on GST and its relations to standards – Peter Kriens, aQute

2.2.11 Legal issues of market introduction of IIRSS

Recommendation number and title

20) Develop a methodology for risk-benefit analysis, achieve a consensus on a European Code of Practice, and establish guidelines for facilitating market introduction of intelligent integrated safety systems.

Activity leader

Automotive industry

Introduction

Existing performance limits and liability issues are delaying the market introduction of intelligent integrated safety systems (IISS). Many systems have been integrated in prototypes performing safety functions, but only a few have been introduced in series production. The creation of a Code of Practice (CoP) implies the establishment of "principles" for the development, testing and evaluation of IISS on a voluntary basis, thanks to a common agreement between all involved partners and stakeholders.

The proposed indicators monitor the progress of the Recommendations following the three steps to be accomplished in the proposed approach.

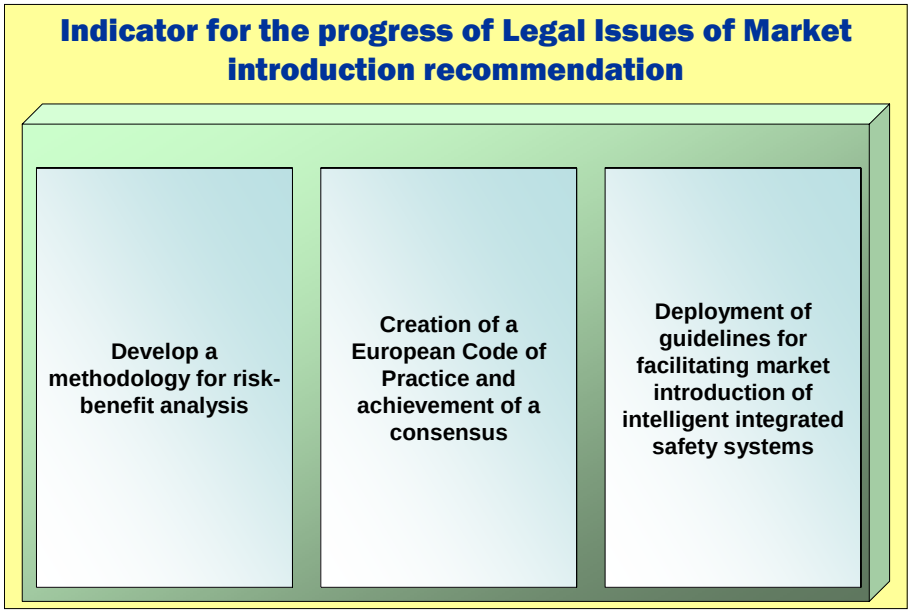

Figure 10 - Breakdown of the indicator for the progress of the Legal Issues for Market Introduction recommendation

Indicator of progress of the recommendation

20.a) Develop a methodology for risk-benefit analysis	For Advance Driver Assistance Systems (ADAS), the RESPONSE 2 project described market introduction scenarios analysing the gap between technological possibilities and market introduction benefits and risks using typical scenario technique procedures. Enabling and disabling factors concerning market introduction were identified and their interactions clarified, outlining the in-principal technological possibilities of modern ADAS implying technical, human factors, and legal risks. As a second step, this deeper understanding of enabling and disabling factors was used for the definition of risk/benefit-assessment methodologies. This was done on a 'microscopic' perspective, where the risks for the entire Human-Machine system had to be evaluated. Furthermore, a macroeconomic approach for a combined risk-benefit analysis was developed. Lastly, these risk identification and assessment strategies were translated into a requirements definition for a CoP for development and testing of ADAS.
20.b) Creation of a European Code of Practice and achievement of a consensus	The RESPONSE 3 subproject of the Integrated Project PReVENT released the CoP in October 2006 to provide the vehicle industry with the tools and common understanding to manage problems about safety concerns and liability. The CoP comprises a suitable ADAS description concept, including ADAS specific requirements for system development. It summarises best practices and proposes methods for risk assessment and controllability evaluation. The application of the CoP is one possibility to demonstrate that state-of-the-art procedures in ADAS development has been applied, including risk identification, risk assessment and evaluation methodology. The risks of ADAS may be highly complex. The term "defective product" is used in the European Product Liability Directive not only in a technical sense, but it is also linked to human factors including system requirements such as dependability, controllability, comprehensibility, predictability and misuse resistance. Currently, the technological safety issues are standardised within ISO TC22, while RESPONSE 3 is focusing on the human-machine interaction safety issues of ADAS, in particular on driver controllability. Since September 2006, the first application phase of the CoP has been monitored by ACEA's Task Force Active Safety. All companies applying the CoP are currently reporting on the practical usage, discussing recommendations for change and future steps.
20.c) Deployment of guidelines for facilitating market	The EC Recommendations "on safe and efficient in-vehicle information and communication systems: update of the European Statement of Principles on human machine interface"

introduction of IISS	released in 2006 (see Section 2.1.3 of this report) represent a collection of guidelines to develop human machine interfaces.

Analysis of the progress

	Member States and the relevant industry actors were supposed to implement the HMI principles of the updated ESoP before December 2007, as already mentioned in section 2.1.3 of this report. However, up to now the take-up is patchy at best. The automotive industry is reasonably well informed, but these principles are unknown to and ignored by a large part of the nomadic device industry. Moreover, it is difficult to assess the awareness of and compliance with the ESoP's HMI principles by the vehicle and portable device industries.

Report on the legal issue recommendation

Current Status

Existing performance limits and liability issues are delaying the market introduction of intelligent integrated safety systems (IISS). Many systems have been integrated in prototypes performing safety functions, but only a few have been introduced in series production. The creation of a Code of Practice (CoP) implies the establishment of "principles" for the development, testing and evaluation of IISS on a voluntary basis, thanks to a common agreement between all involved partners and stakeholders.

The proposal to establish such a Code of Practice was confirmed by the Commissions Communication COM(2003) 542 of 15 September 2003. The CoP should contain descriptions of procedures and processes for analysis of user requirements, definition of systems according to these requirements, and validation procedures showing that safety related customer requirements are fulfilled. It should have a special focus on an integrated "system safety - human factors" approach - a basis for future standardisation efforts - and also give advice on the legal questions regarding product liability, driver responsibility, and manufacturer's liability.

For Advance Driver Assistance Systems the project RESPONSE 2 described market introduction scenarios analyzing the gap between technological possibilities and market introduction benefits and risks using typical scenario technique procedures. Enabling and disabling factors concerning market introduction have been identified and their interactions clarified, outlining the in-principal technological possibilities of modern ADAS implying technical, human factors, and legal risks. In a second step this deeper understanding of enabling and disabling factors was used for the definition of risk/benefit-assessment methodologies. This was done on a 'microscopic' perspective, where the risks for the whole Human-Machine-System had to be evaluated. Further a macroeconomic approach for a combined risk-benefit analysis was developed. In a third step these risk identification and assessment strategies were translated into a requirements definition for a CoP for development and testing of ADAS. This included the analysis of already existing procedures and standards as well as the derivation of need for additional ADAS-specific procedures. Content, structure and formal aspects of a future CoP was defined.

In October 2006, the RESPONSE 3 project, a subproject of the integrated project PReVENT, released the CoP to provide the vehicle industry with the tools and common understanding to overcome and to help managing the problems about safety concerns and liability. The CoP comprises a suitable ADAS description concept including ADAS specific requirements for system development. It summarises best practices and proposes methods for risk assessment and controllability evaluation. The application of the CoP is a possibility to demonstrate that state-of-the-art procedures in ADAS development have been applied, including risk identification, risk assessment and evaluation methodology. Risks of ADAS may be highly complex. The term "defective product" is used in the European Product Liability Directive not only in a technical sense but it is also linked to human factors including system requirements such as dependability, controllability, comprehensibility, predictability and misuse resistance. Currently the technological safety issues are standardised within ISO TC22 while RESPONSE 3 is focusing on the human-machine interaction safety issues of ADAS, in particular on driver controllability, an ADAS key issue.

The RESPONSE 3 consortium is now encouraging all people involved in the ADAS development to benefit from applying the Code of Practice in their companies. Since September 2006 the first application phase of the CoP developed by RESPONSE 3 is being monitored by the Task Force Active Safety within ACEA.

The regulatory framework for the implementation of ADAS was discussed at the Berlin eSafety Conference in June 2007. Conclusions recommended that, when ADAS are being developed, it is important to ensure that the driver's control of his/her vehicle is not impaired, and thus there will be no special liability risks. The principles developed in the RESPONSE 3 project could be taken as a basis to make the implementation of this requirement in the development of ADAS manageable. They could thus help to minimise technological development risks, and thereby de facto reduce liability risks. Observation of the functional performance of intervening ADAS in actual traffic – such as in regular vehicle inspections or product observation – can make a further de facto contribution to minimising liability risks and take-up of the systems by detecting and, if necessary, correcting errors below the systemic performance limits. In addition, explanation of the principle of vehicle controllability in the Convention on Road Traffic could support legal clarity and further help to ensure comprehensive cross-border road transport.

Contacts:
Mr Maxime Flament, ERTICO – ITS Europe, m.flament@mail.ertico.com
Dr Juergen Schwarz, DaimlerChrysler AG, juergen.s.schwarz@daimlerchrysler.com

2.2.12 Ultra wide-band 24 GHz short range radar

Recommendation number and title[10]

21) Take the necessary actions for early review of regulatory conditions to the use of short-range radar (SRR) in Europe, taking into account the proposal for a frequency shift to a centre frequency around 26.5 GHz for UWB.

22) Undertake the standardisation in ETSI for the 24.25-29 GHz UWB radar.

Activity leader

21) European Commission

22) Standardisation bodies

Introduction

Short-range radars (SRR) that can detect collision dangers and automatically apply a vehicle's brakes require a harmonisation of the radio spectrum as well as specific actions to facilitate their coordinated introduction.

Recommendation 21 requests some specific actions to assure that the introduction of SRR will not cause incompatibility with the national and European regulatory framework, and the corresponding indicator measures the deployment of regulation tools. Recommendation 22 aspires to a standardisation of SRR through agreements reached within standardisation bodies (ETSI), the corresponding indicator is the release of a standard.

Indicators of progress of the recommendations

21) Deployment of regulation tools	An EC Decision required Member States to designate the 24 GHz radio spectrum band to be available no later than 1 July 2005 for automotive SSR in the EU, making that spectrum available until 30 June 2013. The decision calls for a fundamental review of the regulatory structure by the end of 2009.
22) Standards released	No standardisation work is currently being undertaken for the 26.5 GHz SRR.

[10] Under the request of the European Commission, Recommendation 21 and 22 have been updated by Dr Gerhard Rollman (SARA Group) to keep track of the renewed challenges of the eSafety initiative for this topic.

Analysis of the progress

	A set of decisions that regulate the 24GHz and 76-77 GHz band. Take-up of the technology has been lower than anticipated and a review of the regulatory structure is needed. Considering that the technology for the 76-77 GHz band will not be mature and cost-effective by the 2013 deadline, and take-up of 24 GHz SRR has been slow, a review of a possible frequency shift to 26.x GHz (frequency range 22.25 to 29 GHz) is needed. Therefore standardisation work will actually become a priority.

Report on the progress of ultra wide-band 24 GHz short range radar recommendations

Current Status

Short-range radars (SRR) that can detect collision dangers and automatically apply a car's brakes are recognised to be an important technology for IVSS and are currently available on the market. However, the introduction of SRR at the European level has been slower than anticipated. Industry believes a revised European regulatory framework is required assure harmonisation and avoid incompatibilities with national regulations

The current European frequency regulation restricts the implementation of UBW SRR operating at 24 GHz center frequency into new cars to end of June 2013. After that date new cars have to be equipped with UWB SRR operating at 79 GHz. However 79 GHz technology is still in a research status and will not be available for a one-to-one replacement in time. Due to the long development and production cycles of the automotive industry there is a serious risk of a technology gap. In addition many car makers were not able to use of this technology at all because their car lines would cross the 2013 deadline. This also will be the case even for the car manufacturers which have already 24 GHz SRR in their car lines.

The frequency decision for 24 GHz SRR foresees a fundamental review in 2009 at the latest. This review shall start as soon as possible and take into account the SARA proposal of frequency shift to a center frequency around 26.5 GHz (frequency band 22.25 – 29 GHz). This band causes only a small technology step. The band is already included in the US regulation and under negotiation in Japan. It will give a chance for worldwide harmonization. A corresponding harmonized standard has to be developed by ETSI. The Electronic Communication Committee (ECC) decision ECC/DEC/(04) 03 (19 March 2004) on the frequency bands to be designated for the coordinated introduction of Road Transport and Traffic Telematic Systems, designated the band 77-81 GHz for vehicular or infrastructure radar systems such as SRR (center frequency 79 GHz). The automotive industry holds that the immediate implementation of SRR systems in or around this frequency range would not be feasible for a one-to-one substitution of the 24 GHz technology in time, given the stated relative lack of maturity and cost-effectiveness of the available technology for the 79 GHz band. It believes that in the short term, operation around the 26.x GHz band is the only commercially viable solution. Since 79 GHz technology has some technical advantages the industry will continue to work on 79 GHz technology to develop appropriate technology solutions which are cost-effective and mature.

A harmonized standard is under development at ETSI.

Contacts:
Mr Juhani Jääskeläinen, European Commission, INFSO-eSafety@ec.europa.eu

http://www.europa.eu.int/information_society/programmes/esafety/index_en.htm

2.2.13 Societal aspects

Recommendation number and title

23) Estimate the socio-economic benefits, which can be obtained through the reduction of fatalities, injuries and material damage.

Activity leader

European Commission

Introduction

The impact of intelligent vehicle safety systems goes beyond mere improvements in road safety. Other effects, such as greater reliability of arrival times, environmental benefits or increased driver convenience are also benefits of using IVSS.

This Recommendation follows on and extends Recommendation 3 (see section 2.1.2 of this report), dealing with the development of a methodology and its application for the assessment of the socio-economic benefits. The proposed indicator measures the progress of the Recommendation surveying how many eSafety systems socio-economic benefits were assessed.

Indicators of progress of the recommendations

23.1) Creation of a methodology to assess the impact of IVSS	Identification of the most promising IVSS technologies by the Implementation Road Maps Working Group and creation of a database for the collection of safety and other effects of intelligent vehicle safety systems. Exploratory study on the potential socio-economic impact of the introduction of Intelligent Safety Systems in Road Vehicles (SEiSS project) in 2005. The eIMPACT project is assessed the socio-economic impact of IVSS, including the costs and benefits for the stakeholders and the macroeconomic effects. The methodology was developed for the assessment of the safety and traffic effects as well as the socio-economic feasibility of IVSS. The final results were made available on the traffic, safety and economic impacts and the socio-economic feasibility of 12 different IVSS. The assessment was made in three different scenarios: 2010, 2020 and 100% fleet and infrastructure penetration. A specific study on the impacts of cooperative systems, CODIA, utilised and developed further the methodologies as developed in eIMPACT for five systems in 2008. TRACE project developed, among others, statistical methodologies giving more insight to different factes of safety impact assessment utilising the accident causation approach.

	The PreVENT subproject PReVAL evaluated the safety and other impacts of the systems or functions as developed in the many subprojects of PreVENT but not covered by eIMPACT.
23.2) Creation of a methodology to validate vehicles equipped with IVSS	In 2006, the European Commission launched a feasibility study on independent testing programmes for ICT-based safety systems called ASTE (Active Safety Testing in Europe). The aim was to assess the technical and economic feasibility of setting up an independent performance and conformance testing programme for Intelligent Vehicle Safety Systems in the EU, to define the necessary methods and principles, and to evaluate if consensus on the proposed principle can be achieved with different stakeholders. The study has concluded in favour of a harmonised testing programme, stating that performance testing is technically and economically feasible, and performance testing shall be developed to test the performance of a safety function in a traffic scenario, not to verify fixed requirements on individual technical systems. To this extent, consensus between different stakeholders can be achieved, but this requires lot of efforts to gain a common platform.

Analysis of the progress

	Several projects have produced different methodologies for the impact assessment of IVSS (SEiSS, eIMPACT, TRACE, PReVAL, CODIA; eIMPACT extends the SEiSS methodology; PReVAL and eIMPACT use the same safety impact assessment methodology; CODIA developed the methods further for cooperative systems). The application of these methodologies to the different systems has allowed the consolidation of a list of priority systems and policy development at European and national levels. As all systems were not covered by these studies and the methods were not fully compatible, the list is not exhaustive, however. The ASTE feasibility study concluded that performance testing is economically and technically feasible. The next step is for suppliers to agree on standardised test methods. More research must also be done on driver behaviour and driver modelling. Other requirements include the development of performance testing methods, and consensus on how performance testing should be encouraged, managed and controlled.

Report on the progress of impact assessment of eSafety systems recommendations

Current Status of the methodology to assess the impact of IVSS

The work on a methodology to assess the safety impact of eSafety systems started within the Implementation Road Maps WG, which collected information about the safety impacts of ITS systems from various sources (literature, German and Swedish accident causation data, data analysis of the European CARE accident data base). In close liaison with the Implementation Road Maps WG, eSafety Support has developed a database (http://www.esafety-effects-database.org) on the safety and other effects of intelligent vehicle safety systems that was launched in the summer of 2006 and is being updated on a regular basis with new research results.

An exploratory study on the potential socio-economic impact of the introduction of Intelligent Safety Systems in Road Vehicles (SEiSS project) was completed in January 2005. The socio-economic impact was preliminarily estimated for a certain number of cases showing a positive cost-benefit ratio in the long term. The project provided a survey of current approaches to assess the impact of new safety functions, developed a methodology to assess the potential impact of intelligent safety systems in Europe, provided factors for estimating the socio-economic benefits resulting from the application of intelligent road safety systems. (These factors, such as improved journey times, reduced congestion, infrastructure and operating costs, environmental impacts, medical care costs etc., will be the basis for a monetary assessment, and in the development of a framework for exploring market deployment scenarios.)

The socio-economic impact assessment methodology developed in the SEiSS project was then extended in the eIMPACT project that started in 2006 to address stakeholder-specific issues. All other work packages and tasks are defined in relation to the socio-economic impact assessment. Key activities include: the identification of the most promising stand-alone and co-operative IVSS technologies, the development of scenarios for IVSS for the years 2010 and 2020, the impact of IVSS traffic safety and efficiency in these scenarios, and the identification of policies to enable the implementation of IVSS.

The output of eIMPACT was an assessment of the socio-economic impact including a picture of the costs and benefits for the stakeholders and the macroeconomic effects, which will contribute directly to policy development at European and national levels. The work started with the development of the methodologies required by the different aspects of socio-economic assessment for the parts not covered in sufficient detail by SEiSS. The final results were made available on the traffic, safety and economic impacts and the socio-economic feasibility of 12 different IVSS. The assessment was made in three different scenarios: 2010, 2020 and 100% fleet and infrastructure penetration.

From an accident-causation perspective, the Accident Causation Analysis WG has examined available European data sources including CARE, MAIDS, GIDAS, EACS, CCIS, OTS, IRTAD. These sources contain general accident statistics and/or in-depth details and range from European to national and private level. All sources contain useful data, so one of the first tasks has been to see how these heterogeneous sources could be better used to yield a more consistent European picture that would provide a usable safety diagnosis to enable impact assessment and thereby identify priorities for action.

The TRACE project developed, among others, various methodologies for safety impact assessment. TRACE contributed to the efforts to develop and improve methodologies related to accident causation, in particular in the area of data analysis. Special care and attention was brought to methodologies which enable the linking of different databases. As a whole, TRACE provided a picture of the accident causation problems on European roads by combining explicitly in-depth accident analysis, road epidemiology and human factors analysis.

In addition, PReVAL evaluated the potential of the functions and systems developed in the PReVENT subprojects with regard to the HMI results - user acceptance, preferences and behaviour, and estimated the potential safety impacts of the PReVENT functions not covered by eIMPACT. PReVAL utilised the methodologies developed in eIMPACT.

A specific study on the impacts of cooperative systems, CODIA, utilised and developed further the methodologies as developed in eIMPACT for five systems in 2008.

Current Status of the methodology to validate vehicles equipped with IIVSS

Even though IVSS systems have shown great potential for reduction of accidents and fatalities, few of them are currently commercially available. Among the various reasons for slow deployment are issues related to reliability and liability. While current legislation doesn't define the requirements these systems must fulfil, standards have to be agreed on to facilitate their market introduction. Therefore, an independent testing methodology to assess the performance of the ICT-based safety systems is needed – comparable to existing type approval tests or additional tests (e.g. crash tests) assessing passive safety performance of vehicles.

The main area of concern within the current type-approval system and additional passive safety performance tests is to ensure that the construction of the vehicle is capable of providing acceptable levels of safety, mainly to vehicle occupants but also to other road users. Similar procedures should be developed for IVSS, which are used to avoid accidents, mitigate the effects in case of an accident and assist in recovery following an accident. The challenge for performance testing is that traffic situations in connection with Intelligent Vehicle Safety Systems are highly complex and involve a magnitude of variations. Therefore the traditional testing methods are not suitable for testing these systems as such.

A feasibility study on independent testing programs for ICT-based safety systems called ASTE (Active Safety Testing in Europe) was launched by the Commission in 2006 with the aim to assess the technical and economic feasibility of setting up an independent performance and conformance testing programme for Intelligent Vehicle Safety Systems in EU, to define the needed methods and principles, and to evaluate if consensus on the proposed principle can be achieved with different stakeholders.

The study has concluded in favour of a harmonised testing programme, recommending that performance testing should be developed to verify the performance of a safety function in a traffic scenario, but not to confirm fixed requirements in individual technical systems.

However, the ASTE final report recognises that a testing programme will be a complex matter, because of technical, organisational and marketing issues. It will be important to find a performance testing programme with benefits for both traffic safety and industrial development. Some conclusions may be regarded as sensitive by some stakeholders. Further discussion will be needed to strengthen the acceptance by stakeholders.

ASTE says that performance testing could be based on documentation, systems or traffic scenarios.

1. For a document-based test, an evaluation would be performed by reviewing the design, system and functional specifications supplied by the manufacturer. The advantage to this method is the low cost involved, but the disadvantage is that it is difficult to assess a system through only a theoretical review.
2. A system-based test would use a combination of practical physical tests to verify a safety system. The potential drawback is that it may limit the technical development of new safety systems since minimum requirements and definitions will depend on today's technology.
3. Scenario-based performance testing puts a vehicle in a real life accident scenario and is the favoured testing method for the ASTE partners. According to the team, the advantages to this set-up are that the test methods can be harmonised, and that the process will be suited to technical system variations and new systems. The challenge will be to define an appropriate number of normative traffic scenarios.

The costs of carrying out such tests are estimated to be in the same order as tests on the passive safety of a vehicle. The testing facilities can also be used during the development of a new system.

Once tests have been performed, the results must be communicated to consumers in a way that ensures their different requirements are met. Results should be communicated on several levels, ranging from a very detailed to a simplified level. Consumers must be able to compare results from different vehicles with ease.

The next step is for suppliers to agree on standardised test methods. More research must also be done on driver behaviour and driver modelling. Other requirements include the development of performance testing methods, and consensus on how performance testing should be encouraged, managed and controlled.

Contacts:
Prof Risto Kulmala, VTT, risto.kulmala@vtt.fi

Recommendation number and title

24) Stimulate and support road users and fleet owners to buy vehicles equipped with intelligent road safety systems.

Activity leader

European Commission / Member States

Introduction

The aim is to stimulate the purchase of vehicles equipped with eSafety systems with instruments such as financial and tax incentives.

Indicators of progress of the recommendation

24) Incentives schemes implemented	So far, very few Member States (Denmark, Germany, the Netherlands) have introduced specific incentives for vehicles equipped with eSafety systems[11]. The effectiveness of these temporary de-taxation schemes could not be clearly assessed. No coordinated action at the European level has been undertaken to introduce incentives for intelligent road safety systems.

Analysis of the progress

	So far there has been no concrete progress on the process of paving the way to the introduction of instruments such as financial and tax incentives at European scale, principally due to the lack of a clear cost-benefit analysis and to the obstacles represented by the European legal framework.

Report of the support to the recommendation about the support of eSafety systems purchase

The EU needs to focus on safety and energy efficiency, but must be able to create a legal framework that will enable a market. Experience of vehicle end-of-life regulations shows that such legal frameworks can be designed and implemented.

[11] See "Incentives Schemes applied by the Member States in the Transportation Sector: towards the design of a strategy to support the adoption of eSafety", Alessandro Carrotta, 2005 (www.esafetysupport.org/download/socio_economic_studies/Incentives%20study.pdf)

The introduction of fiscal incentives to stimulate the purchase of vehicles equipped with eSafety systems or stand-alone systems was recommended in the final reports of several eSafety Working Groups (Heavy Duty Vehicles, Implementation Road Maps, User Outreach) and the EC Communication on the Intelligent Car Initiative[12] published on February 2006 recommends the eSafety Forum to "investigate the possibility to use appropriate incentives schemes at national level in order to support the purchase of vehicles equipped with advanced safety functions and after-market installations. Fiscal Incentive schemes should be introduced by Member States in a coordinated manner across the EU to avoid fragmentation of the internal market, and mainly take the form of tax differentiation, aimed at influencing consumer's behaviour towards a well defined category of vehicles, which will be equipped with the preferred advanced safety functions and after-market installation. Any incentive plan including national support to Intelligent Car technologies will be carefully elaborated in conformity with State aid rules". However, no specific actions have been undertaken at the European level to introduce specific incentives for such systems.

Studies of the effectiveness of awareness and promotion schemes suggest that there is sometimes a mismatch between the perspectives of those who might buy such systems and the awareness and promotion activities pursued. For example, driver concerns over cost and freedom of driving need to be taken more into account in activities aimed at encouraging take-up. Furthermore, there is also a lack of knowledge about the effectiveness of financial incentives and which ones work best. Impact assessment studies are therefore needed.

Incentives such as the feel good factor might provide a way forward. This is a positive approach, but there are also negative ones that involve penalising people, in some way, for not using electronic safety systems. Charging higher insurance premiums for cars not fitted with electronic safety devices is one example. Whatever option is followed however, it is important that the internal market is not distorted.

In the high-end market costs may not be a significant issue, but costs are a big concern in the low-end market. People who buy cheaper cars are probably not willing to pay the extra cost involved and this acts as a barrier to the incorporation of the technologies into low-end vehicles. Tax incentives may be one way to overcome this problem, which might only need to be a temporary measure, since once large-scale penetration is achieved the need for such tax incentives disappears. Possible distortions created by higher tax rates for add-on extras as opposed to lower rates for built-in features, also need to be identified and eliminated. In the end however, given the price sensitive nature of the low-end market, what is needed is a simple message for buyers, and a lower tax rate for electronic safety systems, built-in or added on, may just provide such a message. However, consideration should also be given to younger drivers who are perhaps less likely than more mature drivers to consider the possibility of an accident.

[12] COM(2006) 59 final - Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions on the Intelligent Car Initiative "Raising awareness of ICT for Smarter, Safer and Cleaner Vehicles"

Another perspective is for governments, through their own fleet purchasing activities, to support and lead the market for electronic safety systems. Perhaps efforts should be focused on all fleet buyers as they tend to have a less emotional approach, being more concerned with financial matters. The prospect of, for example, lower insurance premiums could be a big incentive for such people to opt for electronic safety systems, which would help to create a market and lead to economies of scale.

The above considerations focus on the demand side, but there is also the supply side to consider. A simpler alternative to demand side measures would be to just require that electronic safety devices be fitted as standard, and not to leave the choice to buyers. This would mean that all manufacturers would have to offer the same minimum features.

Current applied incentive schemes

A survey on different kind of incentives that could fit eSafety technologies was produced by the European Commission in 2005. This survey reports about two best practices in the EU:

- The Netherlands, where a campaign was proposed to increase road safety and gain environmental benefits (reduced noise and emission) by facilitating the market introduction of vehicles equipped with new navigation, safety and fuel consumption control devices. Although the incentives reduced the price of the equipment, the overall scheme did not enjoy great success.
- Denmark, where fiscal incentives were introduced aiming at reducing the special vehicle taxes for vehicles equipped with traffic safety equipment such as airbags, ABS, and ESC

In Germany, the three-year initiative Safety Truck Plus launched by DEKRA, Daimler and Allianz aims to assess the impact of an integrated truck safety concept in real world driving conditions, equipping trucks with safety systems plus driver training, representing another interesting attempt of launching an incentive. Participants get discounts when ordering the safety systems, insuring their trucks and using other services. The discounts equal approximately 70% of the additional truck cost. All participating trucks must have ABS/ASR, electronically controlled brakes, front underrun protection, passenger protection, optimised mirror system, reversing warning, splash water protection. Trucks can participate in a one or two star category. The one-star trucks must have ACC and Lane keeping support in addition whereas the two-star trucks have to be equipped with these plus a brake assist system and optimised driver protection (airbag and belt tensioner).

Current perspective

In the aforementioned study, several incentive schemes for environmental purposes were surveyed, and the effects of the actions on the environmental side were based on a defined quantitative assessment of the results expected in terms of economic and environmental impact.

This aspect lacked the two examples of incentives for eSafety technologies mentioned above. In order to design a cost-effective incentive scheme, the results of an impact assessment analysis are necessary and should be carried out for each of the scenarios following the introduction of the different incentives. For a quantitative comparison of the benefits, a cost-benefit analysis correlating the introduction of eSafety and its global economic impact is needed, as it was confirmed during the panel session of 8th eSafety Forum in September 2007 dedicated to incentives.

Table 5 - European car taxation situation

	European Car Taxation Summary	Average % Tax
1	Switzerland	7.6%
2	Germany	16.0%
3	Great Britain	17.5%
4	Czech Republic	19.0%
5	France	19.6%
6	Italy	20.0%
7	Belgium	21.0%
8	Poland	22.0%
9	Spain	24.4%
10	Sweden	25.0%
11	Hungary	25.0%
12	Austria	30.7%
13	Greece	33.6%
14	The Netherlands	50.8%
15	Portugal	54.7%
16	Finland	71.9%
17	Norway	98.5%
18	Denmark	178.8%
Western Europe Average		23.4%

The European car taxation situation is strongly fragmented (see Table 5) and the European treaties prevent de-taxation schemes to be applied straightforwardly. Fiscal incentives are a category of state aids which, in principle, distort competition in the Common Market by favoring certain firms or favoring the production of certain goods. They are prohibited by the article 87 of EC Treaty and a specific EC decision is needed to exempt some specific situations.

In conclusion, therefore, it is evident that offering incentives is not a straightforward issue; many factors need to be considered. Further work needs to be undertaken to better understand the impacts of different kinds of incentives, and to highlight inconsistencies in national tax regimes. Incentives also need to be accompanied by improved dissemination of the benefits to buyers, and driver concerns should be better considered in such awareness activities.

Contacts:

Mr Juhani Jääskeläinen, European Commission, INFSO-eSafety@ec.europa.eu

http://www.europa.eu.int/information_society/programmes/esafety/index_en.htm

2.2.14 The different business cases

Recommendation number and title

25) Identify best practices for positive business cases to promote the introduction of intelligent integrated road safety systems.

26) Support the eCall business model by implementing the full service chain and ensuring interoperability and compatibility with E-112.

Activity leader

25) Multi-sector organisation

26) Member States

Introduction

For both public and commercial services there needs to be a successful business model. These Recommendations aim at assuring the development of positive business cases supporting the deployment of the systems in the market.

Indicators of progress of the recommendations

25.a) Business cases available	Different business cases have been developed for TMC. The CVIS Deployment enablers sub project in February 2009 will discuss on the business models based on the CURB, CINT CF&F applications. Moreover, CVIS is currently drafting a white paper on the CVIS deployment roadmap DEPN 8.1 where a collection of positive business cases for CVIS applications / services will be identified. Studies on eCall business cases were developed within DG eCall.
25.b) Positive business cases (based on a cost-benefit analysis)	No availability of positive business cases at present. A concrete step forward is expected with the outcome of the field operational tests (FOTs - see Recommendation 4). The results of the tests will provide the data for building positive business cases.
26) Actions supporting the building of a positive business case for eCall	In spite of a number of special meetings the EC has arranged with stakeholders such as insurance companies, telecommunication companies, mobile network providers, as well as emergency call service providers and public authorities, no agreement has yet been reached on a business model.

Analysis of the progress

	There is still a lack of positive business cases for several eSafety priority systems, such as eCall, RTTI, and cooperative systems. For both public and commercial services, a successful business model is necessary to enable the deployment of the systems.

Report on the progress of business cases for the eSafety systems recommendations

Current Status of Business Models for IIRSS

For both public and commercial services, a successful business model is necessary. As in the past, the public model rests on securing safety benefits judged to outweigh the costs of providing the service. For any commercial provider, the challenge is to collect sufficient revenue from customers while minimising the cost of data collection and service provision. Individual drivers are reluctant to pay directly for services such as traffic information, especially safety messages, that are commonly understood to be provided free of charge as a public service.

An exploratory study on the potential socio-economic impact of the introduction of Intelligent Safety Systems in Road Vehicles (SEISS) was completed in January 2005. The socio-economic impact was preliminarily estimated for a certain number of cases showing a positive cost-benefit ratio in the long term (see Recommendation 23).

For TMC services, from the organisational point of view, the communication, commitments and contract agreements of each interaction must be clearly defined throughout the service chain — whether the basis for the service is public, private or mixed. Each of these scenarios forms a possible business case (see Table 6).

Table 6 - Business cases for TMC

Implementation	Advantages	Disadvantages
Public e.g. German, Spanish national public services	• Service forms part of government approach to improve road efficiency/safety • Free access to service (both for service provider and for user) for widest possible user base • Governmental involvement may help development of cross-border support • Consistency with other Public Authority driver information, e.g. VMS displays	• Unequal and partly limited investment in infrastructure and advertising across Europe • Improvements dependent on Public Authority support/strategy and funding • In most countries progress suffers from long planning and contracting processes. Therefore may be less flexible • May not be a market-driven approach e.g. individualisation
Private e.g. ITIS in UK, TMCPro in Germany	• Private funding can support investment in advanced data collection and processing • Private companies motivated to make a high quality service to satisfy customer demands (both user and OEM) • Private services support complete delivery chain • "Self-funded" i.e. doesn't require public expenditure	• Reduced accessibility for users if not in parallel with free service • Potentially smaller user base reduces public safety and efficiency benefits by creating a "two-class" traffic information environment • Some commercial services may have restricted coverage due to non-national radio stations • May require roaming agreements
Mixed (public/private partnership)	• Private data can be sourced to support service quality (e.g. multiple sources) while maintaining government control over service scope and quality	• Cost of private service chain components must be compensated • Potential conflict between aims of public and private stakeholders if agreements not clearly defined

The RTTI WG has identified that, other than free services such as those offered by TMC in many countries today, annual or monthly fees such as a radio tax or a one-time down payment added to the purchase price of the receivers could be more easily accepted by the customers than a pay-per-use service.

The Integrated Projects COOPERS, CVIS and SAFESPOT deal with cooperative systems, including the development of related business models, but these will only be available at the end of 2008. A first workshop on Business Models and Business Cases for Cooperative Systems was organised in June 2007 by the CVIS Integrated Project.

Current Status of Business Models for eCall

In order to assess and secure the socio-economic benefits of European eCall, it is necessary to collect, compare and combine existing studies and test results. These proven figures and acceptable assumptions should support the business case analysis, and allow further discussions on how the stakeholders can balance efforts and benefits for a common willingness to deploy eCall. This information should also help to determine how the expected benefits are distributed between public and private sectors.

The eCall model still has some outstanding economic issues which must be addressed:

- Significant upfront investments must be made by the automotive industry, telecoms and emergency authorities.
- When in service, eCall is expected to reduce the costs of social security and of the insurance companies. However, neither of these two constituencies would have contributed to the investment.
- The upfront investments of the automotive and telecom industries would be largely pointless unless the emergency authorities, as an initial step, would also invest to make their operational processes compatible with eCall.

The need for a positive eCall business case was identified at the high-level meeting on 3 February 2005. The EC has also been requested to make an in-depth analysis on the possible use of fiscal incentives (reduction of vehicle taxes).

A working group was originally established to look at the business case for Intelligent Vehicle Safety Systems. Due to very close synergies with the eCall Working Group, and a majority of overlapping members, this group was merged into the eCall Driving Group. DG eCall concluded its work in 2006 with the release of its final recommendations.

DG eCall brought forward work on the three different business cases:

Name	Objective
Business Case 1 (BC.1)	Overview of the studies currently available
Business Case 2 (BC.2)	Cost/benefits for the insurance industry – potential business case
Business Case 3 (BC.3)	Vehicle manufactures to define the costs of the In-Vehicle System

DG eCall produced a clarification paper in its final report with an overview of available studies on proven or assessed benefits of eCall. The document is available online: www.esafetysupport.org/download/ecall_toolbox/Reports/Appendix_16.pdf

To support the business model, it is necessary for the main eCall stakeholders to sign the agreed eCall Memorandum of Understanding. The MoU is ready for signature and has already been signed by a number of stakeholders. (see section 2.1.7)

Contacts:
IIRSS:

Mr Juhani Jääskeläinen, European Commission, INFSO-eSafety@ec.europa.eu

http://www.europa.eu.int/information_society/programmes/esafety/index_en.htm

eCall:

Mr Wolfgang Reinhardt, ACEA, wr@acea.be

2.2.15 User Outreach

Recommendation number and title

27) Design and execute awareness campaigns that explain the benefits, functioning and use of the intelligent integrated road safety systems to the consumers.

Activity leader

User organisations/eSafetyAware!

Introduction

This Recommendation refers to the activities aimed at creating a close link between the development of eSafety technologies and the end users. The benefits of these advanced technologies are difficult to disseminate to a broad public and more engagement of the user might bring the technologies closer to a market introduction. A way to measure the progress of this last recommendation is to check which organisations are involved in the realisations of campaigns, the actual campaigns organised, and the effectiveness of these campaigns measured by the number of people reached.

Indicators of progress of the recommendations

27.1) Bodies supporting the organisations of campaigns	The User Outreach Working Group worked to define a strategy for the dissemination of eSafety research to the end user as well as public awareness activities (eSafety campaigns) to promote the eSafety systems already available on the market. The third pillar of the Intelligent Car Initiative promotes the dissemination of the potential of intelligent vehicle systems to raise both drivers and policy makers' knowledge about the systems, stimulate user demand and create socio-economic acceptance. The "eSafetyAware!" platform, grouping public authorities, industry and user organisations, aims to create more awareness about eSafety in the general public through specific campaigns. eSafety Support is also contributing to the user outreach by focusing on the decision makers and experts in its dissemination activities. Furthermore, specific outreach actions were realised at national level by various stakeholders.
27.2) Technologies campaigned	The i2010 Launch Event took place in Brussels in February 2006, featuring demonstrations of car safety systems that can support the driver in critical situations. It received a great amount of media attention, with features broadcasted by TV stations all over Europe. A wide range of mature eSafety technologies, plus the outcomes of the research projects, were presented. In September 2007 the i2010 Intelligent Car Event 2007 took place in Versailles together the Integrated Project PReVENT

	Exhibition, promoting a showcase of a wide range of technologies developed in the project. Several other European research projects organised their dissemination events to include a public audience (the Integrated Project GST in February 2007 and PReVENT in September 2007. In 2009, the first tangible results are expected to be showcased by those Integrated Projects launched in 2006). The outreach activities organised by "eSafetyAware!" have thus far focused on ESC. They included a large event with hands-on testing of the system in May 2007 near Rome, and several other events at the national level during the second half of 2007. The first quarter of 2008 was an active period for the "eSafetyAware" ChooseESC! Campaign's outreach activities. In January, the event held within the European Parliament in Strasbourg reached the members of the institution and the press. On 30 June & 1 July, a Symposium was organised within the Autoworld venue and gathered more than a hundred people ranging from representatives of automobile clubs to consumers. The ChooseESC! campaign has a didactic and fun design (human dummies mascots, ESC Survey cards design) which is appealing to the users. eSafety Support has contributed to reaching the users through different actions such as the regular updates of its website, including the latest interactive tools and videos, the organisation of events and the distribution of information material. The main events included the Transport Research Arena, in Slovenia, which made users, car industry representatives, politicians and researchers come together and gave a high visibility to the eSafty initiative. The official launch of the 112 emergency number website was also an opportunity for eSafety Support to diffuse information material and the latest informative videos. In the context of the vote on the Intelligent Car Report, another big event has been organised within the European Parliament gathering MEPs, members of the European Commission and representatives of public authorities. eSafety Support also joined the efforts of ChooseESC! during its Symposium to give additional visibility to the initiative and reach a more "user-oriented" audience. The several Regional Observers meetings held also gave weight to the overall goal of reaching the users by directly addressing the issue to local players involved in ITS which would then diffuse the message within their own countries. Indeed, these meetings intend to review how eSafety players can work together to increase awareness of the benefits of eSafety systems. eSafety Support always highlights the fact that a contribution on User Outreach is awaited from the regional observers.

	At the national level, some campaigns have been organised to promote the end user specific eSafety Systems, including demonstrations, hands-on-the-wheel tests, and teaching modules on eSafety at the university level. General press coverage of eSafety has been quite well distributed, focusing on several eSafety technologies (e.g. ABS, airbags, dynamic traffic management, eCall, ESC, ISA, lane departure warning, RTTI, tire pressure control, etc.) and political issues. eSafety Support and the European Commission developed interactive online tools to explain the benefits of some priority eSafety systems. Radio and TV coverage has been sporadic, covering several systems (eCall, ESC) in a few countries (France, Germany, Slovenia).

Analysis of the progress

	Until now, a majority of awareness actions organised at European level were aimed at decision-makers and less at users. eSafetyAware! started targeting car users and end users with the ChooseESC campaign, focussing on ESC, but promotion on other mature eSafety systems is still absent. Press attendance to the events is a priority and needs to be stimulated. Although eSafety has been covered by most of the European press, and the benefits of specific systems have been promoted in newspapers and specialised magazines (including online versions), there is still a need to get closer to the end user. This could include mass media involvement (TV and radio) and the production of didactic, concise and well -targeted TV series or documentaries specifically dedicated to ICT-based systems. There is a real need for the informative tools aimed at users to be simple (but not simplified too much), more emotional than technical and to explain clearly what the technology is about and which practical benefits they convey. The safety consciousness is what has to be risen. Further campaigns could be proposed for mature eSafety technologies already available on the market. Car dealers and new drivers are being targeted. Progress must be noted in the involvement of automobile clubs which also have a role to play in users' outreach. The eSafety Interactive Car, deployed by eSafety Support in September 2007, with the aim of showing the functioning and the benefits of eSafety systems has been very positively welcomed as a didactic and complete tool. This tool has been displayed during

	each event eSafety Support took part in or organised. Still, the idea of integrating it in the stakeholders' websites hasn't' been fully achieved. At the same time, the European Commission, integrated in its website another interactive car and an interactive eSafety quiz, translated in several languages.

Report on the progress of user outreach recommendations

Current status

At the present time, a close link is being constructed between the development of eSafety technologies and the end users. The benefits of these advanced technologies are difficult to disseminate to a general public and more engagement of the user might bring the technologies closer to a market introduction. All key stakeholders are interested in the user acceptance of eSafety technologies, thus these needs to be supported by a broader dissemination of eSafety functionalities and benefits.

Figure 11 – User Outreach Working Group recommendations overview

The User Outreach Working Group was formed to increase the awareness among the general public about the existence of eSafety systems and their contribution to road safety. The WG has analysed some consumer campaigns and experiences from suppliers, communications models and penetration patterns of some earlier technologies such as ABS.

The WG defined a strategy for dissemination of eSafety research to the end user and public awareness activities (eSafety campaigns) to promote the eSafety systems available on the market, including a list of procedures concerning the definition of communication tools and test/media protocols, as well as the financing of media activities.

The tools for external and internal communication include:

- External communication (to the general public): regular media activities with contributions to press, Internet, TV and radio (e.g. TV footage, website submissions, photographs, press releases, magazine articles), consumer protection tests with benchmarking rating systems, creation of interactive website and games, production of leaflets/info material, presence at fairs and conferences, production of surveys and consumer polls, development of a label/brand.
- Internal communication (to car dealers, driving schools).: organisation of trainings, creation of website, presence at fairs and conferences, supplying PC tools and videos.

As part of the strategy, the WG recommended the creation of an eSafety communication platform. The "eSafetyAware!" platform was launched in June 2006, under the chairmanship of David Ward, FIA Foundation, and currently counts 36 organisations from public authorities, industry and user organisations as members (see Table 7).

The main objective of "eSafetyAware!" is to build awareness of eSafety systems among the general public. The platform has a non-competitive character, through which all the stakeholders can combine forces for common aims, increase efficiency of communication activities, formulate common messages, explain the technologies, their specifications and qualities, and provide the rationale why vehicles should be equipped with such technologies.

"eSafetyAware!" launched the pan-European information campaign on Electronic Stability Control in May 2007, which included the "Choose ESC" launch event took in Aprilia, Italy on 8 May 2007. The "Choose ESC" campaign has also been presented at several events in Europe and worldwide. More information is available on the website www.chooseesc.eu

Figure 12 - The "ChooseESC!" mascots

The awareness pillar of the Intelligent Car Initiative[13] promotes active information and dissemination to a wide audience to raise drivers and policy makers' knowledge about the potential of intelligent vehicle systems, stimulate user demand and create socio-economic acceptance of the eSafety systems. Following the recommendations of the User Outreach WG, it copes with:

- The organisation of regular Intelligent Car Initiative Events aiming at maximising media attention through result-oriented activities such as demonstration days, Integrated Project roadshows, showcases, and workshops.
    - The i2010 Launch Event took place in Brussels in February 2006, featuring demonstrations of car safety systems that can support the driver in critical situations. It received huge media attention, with features broadcasted by TV stations all over Europe.
    - The integrated project GST organised in February 2007 a two-day event at which attendees had the opportunity to test the GST platform in a number of experimental vehicles and computer demonstrations.
    - The European Commission, eSafety Support and the Integrated Project PReVENT organised the i2010 Intelligent Car Event 2007, the PreVENT Demo Days, and the 9th eSafety Forum in September 2007 in Versailles, France.
- The support and launching of targeted activities to raise intelligent car systems awareness including the production of short, well targeted TV series or documentaries on specific ICT based systems, for which a specific budget was allotted in FP7.
- The launching of a comprehensive benchmarking study on ongoing activities in promoting and deploying intelligent vehicle systems in the Member States and in the industry led by TNO, whose results were made available in the second half of 2007.

eSafety Support (www.eSafetysupport.org) is contributing to the user outreach through the creation of animations and videos targeted to both the decision-maker and the end user. A specific section of the project's website integrates specific user-oriented tools to explain the functioning and benefits of eSafety systems, as well as a number of printed and promotional material.

Figure 13 summarises user outreach activities at European level of "eSafetyAware!", eSafety Support, and the action supported by the third pillar of the Intelligent Car Initiative.

Figure 14 shows a mockup of the eSafety Interactive Car produced by eSafety Support and available online: www.esafetysupport.org/download/interactive_car/light.html

[13] COM(2006) 59 final - Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions on the Intelligent Car Initiative "Raising awareness of ICT for Smarter, Safer and Cleaner Vehicles"

Figure 13 – eSafety promotion to the end users at European level

Figure 14 - eSafety Interactive Car snapshot

The European press is covering several eSafety Systems in order to raise the awareness (e.g. ABS, airbags, dynamic traffic management, eCall, ESC, ISA, lane departure warning, RTTI, tire pressure control, etc.) and radio and TV are sporadically covering some of these systems (eCall, ESC) in some countries (e.g. France, Germany, Slovenia)

At the national level, specific actions were undertaken for the promotion of eSafety technologies such as, for instance, and eCall demonstration in Germany, promoted by ADAC, the design of a teaching module on eSafety for post-university education in Italy, promoted by ACI and the University "La Sapienza", or conferences on eSafety topics.

Contacts:

User Outreach Working Group - Mr Wil Botman, FIA, w.botman@fiabrussels.com

Intelligent Car Initiative, Mr Fabrizio Minarini, EC, fabrizio.minarini@ec.europa.eu

"eSafetyAware!" - Ms Gaby Roosen, FIA Foundation, info@esafetyaware.eu

eSafety Support – Dr Alessandro Carrotta, ERTICO – ITS Europe, a.carrotta@esafetysupport.org

2.2.16 The eSafety Forum

Recommendation number and title

28) Create an eSafety Forum with the objective to monitor and promote the implementation of these recommendations, and support the development, deployment and use of intelligent integrated road safety systems.

Activity leader

European Commission

Introduction

This recommendation refers to the activities of the eSafety Forum to support the development and deployment of eSafety systems. The progress of this last recommendation is only measured on the creation of a forum, whose work is shared among the Steering Group, the Working Groups and the Plenary Forum, and its productivity, measuring the activities undertaken to support the development, deployment and use of IIRSS.

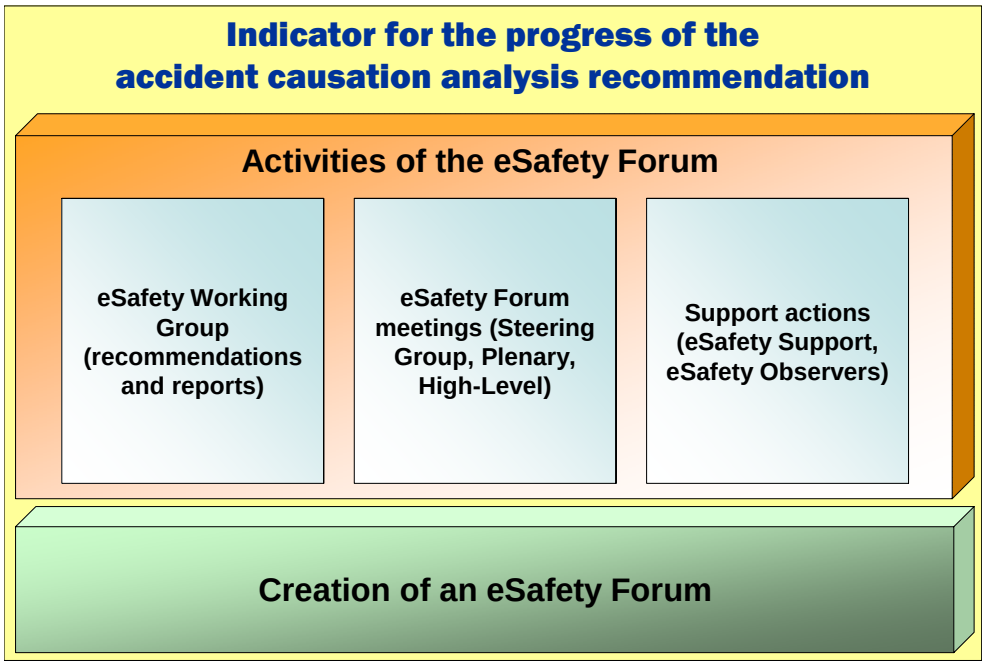

Figure 15 - Breakdown of the indicator for the eSafety Forum recommendation

Indicators of progress of the recommendations

28.a) Creation of an eSafety Forum	The eSafety Forum was established in early 2003 by the European Commission in close co-operation with the industry, industrial associations and public sector stakeholders. As of writing, the Forum's membership includes 322 individuals representing 193 organisations.
28.b) Activities undertaken to support the development, deployment and use if IIRSS	Sixteen Working Groups have been created since the beginning of the Forum, with eight of them already concluded. Examples of successful WG activities: DG eCall: creation of eCall Memordandum of Understanding HMI WG: support for publication of EC ESoP on HMI. Implementation Road Maps WG: road maps for the 11 eSafety priority systems User Outreach WG: support for the creation of the eSafety Aware! platform RTTI WG: support for the publication of the EC recommendations towards further research and deployment of RTTI RTD WG: support for the creation of the Strategic Research Agenda of ICT for Mobility

Analysis of the progress

	The eSafety Forum has been successful in its role of fostering stakeholder activities supporting research and deployment of eSafety systems as well as influencing policies. New Working Groups are created as soon as there is a raising need. New priorities endorsed by the Forum are the support of the development of a cooperative infrastructure, foster the passage of eSafety to other applications (such as ICT for Clean and Efficient Mobility), and provide a vision of 3rd generation systems and services.

Report on the progress of eSafety Forum establishment recommendations

Current Status

The eSafety Forum was established in early 2003 by the European Commission in close co-operation with the industry, industrial associations and public sector stakeholders. Its organisation is managed by the Steering Group, which meets about once every two months. The Steering Group is co-chaired by the EC, ERTICO – ITS Europe, and ACEA and has representatives from all sectors (road and safety authorities, automotive industry, research organisations, service providers, technology providers, users organisations, road and infrastructure operators, telecommunications industry, etc.).

In 2003, the Steering Group defined the Forum's work programme, membership issues and the Working Groups. That same year in September, the European Commission adopted a Communication on Information and Communications Technologies for Safe and Intelligent Vehicles, based on the results from the eSafety Working Group and other consultations. The Communication brings forward the actions the EC intends to take in order to accelerate the development, large-scale deployment, and use of eSafety systems. The actions of the Communication fall into three categories: promoting Intelligent Integrated Safety Systems, adapting the regulatory and standardisation provisions, and removing the societal and business obstacles.

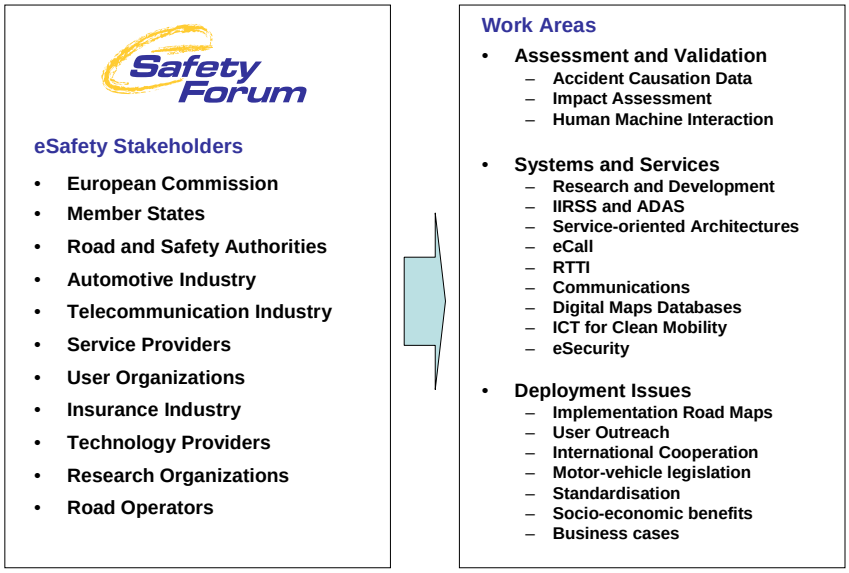

Figure 16 - eSafety Forum constituency and work areas

The Forum aims at removing the bottlenecks that prevent Intelligent Vehicle Systems from entering the market, through consensus building among stakeholders and recommendations to the Member States and the EU. It has established fourteen industry-led Working Groups that focus on priority topics (see below). In addition, the Forum has produced a consistent number of valuable reports that provide important input to industrial initiatives and policy activities. It ensures links with parallel and complementary activities in the ITS domain, such as Cars21, the European Road Safety Action Programme - in particular the European Road Safety Charter, the "Intelligent Transport Systems for logistics and intermodality" initiative announced as part of the EC's Lisbon Agenda and, in the field of the environment, the European Climate Change Programme working group on light vehicles.

With the launch of the Intelligent Car Initiative[14], the activities of the eSafety Forum were extended to cover ICT for cleaner, efficient, and safer transport. It became one of the pillars of the Intelligent Car Initiative and confirmed its role of essential link to decision makers. Within the first objective of the Intelligent Car Initiative, the eSafety Forum will continue to support the EC through its Working Groups.

eSafety Support survey monitored the Forum member's level of involvement in activities in the first half of 2007: it showed an overall positive outcome and high level of satisfaction with the Forum activities:

Value of attending plenary meeting: was found good or very good by 89% of respondents.

Quality of the presentations: good or very good by 92% of respondents.

Quality of the discussion: is good or very good by 60% of respondents.

Relevance of themes is high or very high: by 85% of respondents.

Working Groups

The Forum has 16 Working Groups:

- Accident Causation Data (concluded)
- Heavy Duty Vehicles (concluded)
- Human-Machine Interaction – HMI (reactivated at the end of 2008)
- Digital Maps (concluded)
- Emergency Call – eCall (concluded)
- User Outreach (concluded)
- Real-time Traffic and Travel Information – RTTI (concluded)
- Communications (concluded)
- Intercontinental Cooperation (active)
- Research and Development (active)

[14] COM(2006) 59 final - Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions on the Intelligent Car Initiative "Raising awareness of ICT for Smarter, Safer and Cleaner Vehicles"

- Implementation Road Maps (active)
- eSecurity (active)
- ICT for Clean Mobility (concluded)
- Service-Oriented Architectures (active)
- Intelligent Infrastructure Working Group (active)
- Nomadic Devices Forum (active under the eSafety Forum as of April 2008)

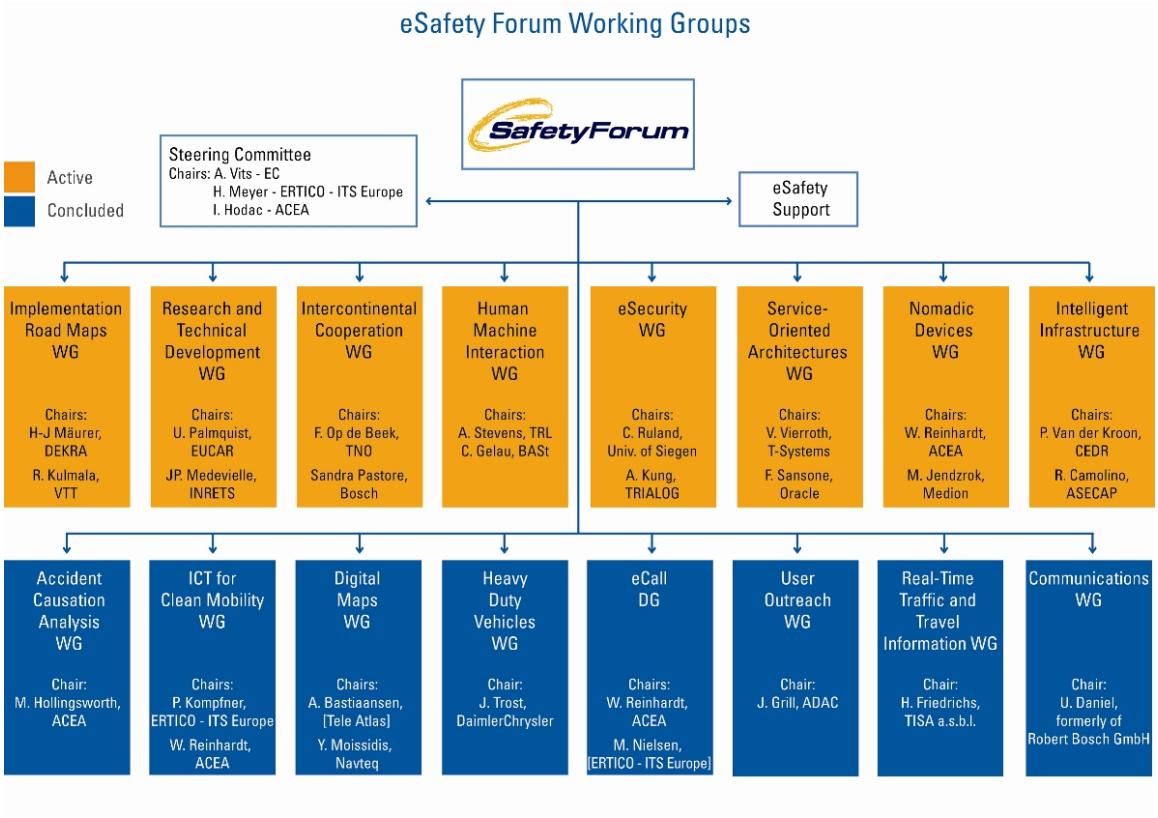

Figure 17 - The eSafety Forum Working Groups

Working Groups can be concluded when their aims have been finalised. New Working Groups can be created as necessary. The status of the Working Groups in early 2008 is indicated in Figure 17.

A complete report on the activities and documents produced by each Working Group can be found on the eSafety Support website:
http://www.esafetysupport.org/en/esafety_activities/esafety_working_groups/

eSafety Support, on behalf of the eSafety Steering Group, organises Steering Group meetings, High Level meetings, and Plenary meetings and workshops, as well as follows the activities of the Working Groups and offers administrative support to eSafety activities.

eSafety Forum Plenary meetings

Until 31 December 2008, nine Plenary meetings have been organised:

1. 22 April 2003 (Brussels)
2. 17 November 2003 (Madrid, Spain)
3. 25 March 2004 (Brussels)
4. 2 June 2005 (Hannover, Germany)
5. 2-3 May 2006 (Brussels)
6. 8 November 2006 (Brussels)
7. 28 February – 1 March 2007 (Brussels)
8. 18 September 2007 (Versailles, France)
9. 24-25 April 2008 (Ljubljana, Slovenia)
10. 6 November 2008 (Brussels)

The tenth meeting will take place on 6 November 2008 in Brussels, Belgium.

eSafety Forum High-level meetings

The eSafety Forum has held a number of High-Level meetings, including September 2004 for public authorities, February 2005 for the private sector, and October 2005 for the Member States. In 2006, a High-Level meeting of the EC's i2010 initiative - a European Information Society for growth and jobs – was organised in Helsinki, where it announced the creation of a new platform to promote awareness brings together stakeholders from the public sector, automotive suppliers and users.

In the context of the German Presidency of the EU Council, the German Federal Ministry for Transport, Building and Urban Affairs held an eSafety conference in June 2007 which focused on the possibilities of using electronic systems to improve road safety. Based on the findings of workgroups on the European level, key issues were discussed such as Real Time Traffic Information (RTTI) / Communications - Enhancing Traffic Information; Human-Machine Interaction (HMI), including eSecurity - the human-machine interface to car multimedia systems, tamperproof technologies and Driver Assistance Systems (DAS) - legal situation and assessment, including the new role of motorists in partially automated in-car processes, EuroNCAP testing procedures for DAS. Discussions focused on the development perspectives of "intelligent mobility" over the next 15 years in the context of the EC White paper on Transport.

On 17 September industry senior executives met with Viviane Reding, European Commissioner responsible for the Information Society and Media, and high level EU Commission representatives to discuss 2010 priorities for the Intelligent Car Initiative. ICT and the Intelligent Car Initiative, of which eSafety Forum is a part, have played a key role in improving road safety in Europe, and there has been considerable progress in the targets set in 2003. However the current economic situation and the climate change have made necessary to reassess the achievements of the last five years, and to set new targets for the next five years. The Intelligent Car Initiative remains the Commission's main instrument in this area, complemented in the future by the ITS Action Plan which is in conception phase.

The industry representatives coming from the automotive, telecommunications, telematics and services sectors are fully supporting the intelligent vehicle safety systems and Intelligent Car Initiative and therefore it was agreed that the debate on the future directions of the Intelligent Car Initiative and the eSafety Forum should be continued using the already established structures of the Forum. Industry and EU Commission representatives agreed that the majority of the 28 Recommendations of the 2002 eSafety Working Group have been either completed or show good progress, and new targets are required for the next years. Another important topics brought into discussion were the establishment of the eCall deployment Platform and the importance of getting Member States and other relevant stakeholders to join it and the lack of progress in some Member States regarding the standardisation process. Therefore industry is not considering 2010 as a realistic target date for eCall roll-out any more. The EU Commission committed itself to find ways of improving he standardisation process and as a first step by taking this issue up with the responsible Commissioners. At the same time industry welcomed Commission's efforts to look into the potential of ICT in clean mobility, and urged the Commission to continue to promote the use of ICT in this area by implementing the recommendations of the "ICT for Clean and Efficient Mobility" Working Group. Both parties considered important to maintain the dialogue and decided to meet in the near future for a follow-up meeting.

eSafety Forum Steering Group meetings

Six Steering Group meetings are normally organised each year. Meetings in 2008 included:

SG meetings	Date	Where
29th SG meeting	**30 Jan**	**ERTICO ITS Europe**
30th SG meeting	**12 Mar**	**ACEA**
31st SG meeting	**28 May**	**EC**
32nd SG meeting	**16 Jul**	**ERTICO ITS Europe**
33rd SG meeting	**17 Sep**	**European Commission**
34th SG meeting	**10 Dec**	**ERTICO ITS Europe**

eSafety Forum Observers

The eSafety Forum Observers Group is a panel of EU Member State representatives invited to report on their national eSafety activities. They are all actively involved in national industry, policy, or R&D activities and are acknowledged experts in their domain or sector.

eSafety Support is responsible for organising these Observers Meetings at the EU and regional levels. European level meetings held once a year join representatives of all EU Member States. Regional meetings take place around Europe and give the opportunity to two or more countries to meet and report on the latest eSafety developments in their countries.

Four European Observers meetings have been organised since the launch of the eSafety initiative:

1. 28 September 2004, Brussels
2. 14 April 2005, Helsinki
3. 21 November 2005, Brussels
4. 02 - 03 November 2006, Stockholm and Helsinki
5. 06 - 07 December 2007, Lisbon, Portugal

Where	Who
Vigo	Portugal, Spain
Gothenburg	Denmark, Finland, Sweden
Turin	Austria, Germany, Italy
Athens	Greece, Malta
Delft	The Netherlands, United Kingdom
Brno	Czech Republic, Slovakia, Poland
Ljubljana	Slovenia
Brussels	Belgium, Luxembourg
Bucharest	Romania
Vilnius	Estonia, Latvia, Lithuania

Figure 18 - eSafety Observers Regional meetings taking place until end of June 2008

Furthermore, nine regional meeting have been organised:

1. 1st eSafety Regional Observers Meeting, 15 May 2006 (Vigo, Spain)
2. 2nd eSafety Regional Observers Meeting, 15 June 2006 (Göteborg, Sweden)
3. 3rd eSafety Regional Observers Meeting, 18 September 2006 (Turin, Italy)
4. 4th eSafety Regional Observers Meeting, 21 September 2006 (Athens, Greece)
5. 5th eSafety Regional Observers Meeting, 31 May – 1 June 2007 (Delft, The Netherlands)
6. 6th eSafety Regional Observers Meeting, 12 June 2007 (Brno, Czech Republic)
7. 7th eSafety Regional Observers Meeting, 22 April 2008 (Ljubljana, Slovenia)
8. 8th eSafety Regional Observers Meeting, 23 May 2008 (Brussels, Belgium)
9. 9th eSafety Regional Observers Meeting, 18-19 June 2008 (Bucharest, Romania)
10. 10th eSafety Regional Observers Meeting, 26-27 September 2008 (Vilnius, Lithuania)

Information about all eSafety Forum activities can be found on www.esafetysupport.org

Contacts:
Mr Juhani Jääskeläinen, European Commission, INFSO-eSafety@ec.europa.eu
http://www.europa.eu.int/information_society/programmes/esafety/index_en.htm

Dr Alessandro Carrotta, a.carrotta@esafetysupport.org

Chapter 3 - CONCLUSIONS

The deployment of an **accident-causation database** is a cornerstone for the eSafety initiative, since a scientific base in needed to determine the main causes of fatal accidents. Based on this information, an impact assessment of the eSafety systems can be conducted, selecting the most appropriate ones to achieve the objective of halving the number of fatalities. However, the indicators above show that even if the progress of the necessary steps for the creation of the database are slowly progressing, with two main projects delivering their results by the end of 2008, its finalisation is still not imminent, since at the moment there are no planned project working on the results and progress already made through SafetyNet and TRACE to continue the work of creating a European accident causation database.

Several projects have produced different methodologies for the **impact assessment** of IVSS (SEiSS, eIMPACT, TRACE, PReVAL; eIMPACT uses and extends the SEiSS methodology; PReVAL and eIMACT use the same safety impact assessment methodology). The application of these methodologies to the different systems will allow the consolidation of a list of priority systems and policy development at European and national levels.

The ASTE feasibility study concluded that performance testing is economically and technically feasible. The next step is for suppliers to agree on standardised test methods. More research must also be done on driver behaviour and driver modelling. Other requirements include the development of performance testing methods, and consensus on how performance testing should be encouraged, managed and controlled.

Field operational tests (FOTs) are a strong priority for this phase of the eSafety initiative. Even if a number of tests have been already launched, there is the need of a European-wide impact assessment of all mature systems to ensure their wider take-up. The structure, organisation and assessment methodology indicated by FESTA are now used by all the relevant EC-funded FOTs and some national ones. The methodology should be adopted by all stakeholders to ensure comparable data across different FOT activities and to bring improvements from field experience. Extensive support is still needed to promote, or even force, the use of the European FOT methodology in the different FOTs. The EC should encourage that all planned activities provide a feedback with their lessons learned from the execution of their FOTs to the FOT-NET support action. Also, FOT-NET should promote FOTs and its methodology at national level in order to encourage national FOT initiatives. With comparable data, the national results should be used as a complementary "local" information to the EC results.

Besides the two EC-funded FOT activities and the support action, the national FOT activities of the Members States are still not fully coordinated. Even if a full control is not necessary, the EC should reinforce the link between European and member states activities and encourage more "EC-coordinated" local public investments for large scale national testing facilities such as region-wide test sites with all the local involvement necessary to run it.

Member States and the relevant industry actors were supposed to implement the **HMI** principles of the updated ESoP before December 2007. However, to our knowledge, until now the take-up is patchy at best. The automotive industry is reasonably well-informed, but often these principles are unknown to and ignored by a large part of the nomadic device industry. Thus, it is difficult to assess the awareness of and compliance with the ESoP HMI principles by the vehicle and portable device industries. Requiring a certification of nomadic device installation has a large potential to bring the nomadic device industry to the table. Through the eSafety Nomadic Devices Working Group, ACEA is working with Nomadic Devices providers to jointly make commitment to the ESoP. The eSafety Forum Working Group on eSecurity, established at the end of 2006, covers the issues relating to the prevention of misuse and manipulation, since the principles contained in the update of the ESoP are insufficient to ensure this on a sustained basis and new technical standards are needed. From January 2009, the eSafety WG-HMI will recommence activities to consider the desirability and practicality of ESoP development. With regard to the workload assessment methodology, satisfactory progress appears to have been made, as described above.

There are **road maps** available for several eSafety systems (with different level of details). The Implementation Road Maps WG has specifically analysed the implementation issues. The eSafety implementation status survey published in November 2007 revealed that roll-out is ongoing but not very fast except for ESC and RTTI, this matter due to the fast and still accelerating market penetration of navigation systems. In addition, the European Commission has initiated its own ITS Action Plan for accelerating the deployment of intelligent systems and the European road administrations have started to develop their own eSafety road map in support of the eSafety Forum's activities. The eSafety Deployment Workshop organised by the eSafety Forum's Implementation Road Maps Working Group showed that the deployment in Europe is approximately on the same level as in Japan, although Japan is more advanced in some fields but a bit behind in some fields. The user benefit workshop in 2008 concentrated on user benefits, their magnitude, relevance to different stakeholders, and how they drive the market. Both of these workshops were combined with the presentation of the annual eSafety Awards. These awards have attracted media attention and are held in great esteem by the persons and organisations awarded. The eSafety Awards are thereby likely to promote the deployment of intelligent vehicle safety systems. A structured monitoring process is planned to be created which will show the appropriate way to monitor the deployment of eSafety systems in future. The time line might be expended to the year 2015 for the possible achievements of eSafety devices in case of road safety and reduction of fatalities. The current road maps are being updated taking on board the recent developments concerning the priority eSafety systems, market introductions of new eSafety systems, results of the eIMPACT and TRACE projects as well as national studies related to the deployment of intelligent vehicle systems. The current status of the implementation road maps is to be published in a specific Monitoring report in 2009.

The eSafety **research** priorities are determined by the European Commission in close cooperation with the stakeholders. One of tasks of the RTD WG is to identify the priorities for research areas for integrated European research, technology and demonstration projects in the field of eSafety, to monitor the development of the research programme and keep it synchronised with the stakeholders' needs. Strong cooperation has led to the identification of the strategic priorities for FP6 and FP7, as well as creating an understanding of needed and non-needed International R&D Collaboration.

In the domain of **communication protocols and interfaces,** there is a *threshold problem* which hinders vehicle owners and drivers to buy such systems, hence industry is reluctant to invest without a clear legal and commercial framework. The EC is recommended to take action on this point. Other *business models* are non-existing today, as the commercial value of these systems is unclear or goes to other entities than those who invest (the cost of accidents and fatalities affect insurance companies, public health care etc., not road operators, the car industry or network operators). Spectrum is available, and based on a report from CEPT, the European Commission is expected to issue a Commission Decision on spectrum and regulatory issues. Many functions (such as crossing assistants) will *need infrastructure devices* to support vehicle assistance systems; public (and private) road owners are reluctant to invest. Sufficient traffic *data for inter-regional and urban traffic management* exists, but public (police, public transport systems, cities, counties and states) and private data owners are not willing to publish those data and their formats are not harmonised. *Cross border data exchange* hardly exists. A COMeSafety-led task force is currently working to define an EU-wide *ITS architecture and strategy*.

Although **international cooperation** is currently undertaken by some EU-funded projects, a higher level of intensity of interaction at the international level needs to be undertaken by the eSafety Forum. Formal bilateral agreements on cooperative agreements were officially signed with Japan and US in 2008.The International Cooperation WG redefined its role under a new chairmanship in 2008 and will pursue its activities preferably in close collaboration with active projects of international cooperation and their networks.

The process of creating a **European digital maps database** is delayed by the lack of availability and, in many cases, of the accessibility of road safety attributes. The completion of the cooperation phase of the road map defined by the Digital Maps WG still needs efforts to be completed.

Three main factors are still jeopardising the current progress towards the full **eCall** deployment:

1. The missing signature of the MoU from 2 major MS, France and UK.
2. Full specification of the eCall system (in terms of standardisation/protocols) is still missing.
3. The non-existence of a feasible business model to speed up deployment

However positive progresses have been observed on these three issues. The signature of the MoU has now reached a "critical mass" level, with 14 signatures, which show that Europe is willing to commit to the eCall service deployment. Moreover the launch of national roll-out platforms and cluster building with exchange of best practices as well as FOTs will most likely encourage new signatures.

Concerning the eCall full specification, despite concrete delays, the positive aspect is that MSD content has been standardized, an agreement has been reached to differentiate between public eCall and private eCall support services with dedicated operating requirements, and an important progress has been made for the transport protocol selection with the opening of the 3GPP analysis 2nd phase. The selection of Qualcomm in-band modem technology is a major step forward towards implementation.

Concerning business models the acceptance of eCall as an option for new type approved vehicles three years after all standards have been agreed upon facilitates the development of an integrated eCall system but faster implementation could be reached when the current national recovery plans also include the promotion of upgrading the PSAP infrastructure and provide fiscal support for customer buying new cars with eCall.

With **RTTI**, there is an increasing implementation and coverage of TMC, plus development progress in TPEG with a first service launched in UK during 2008. Non-profit organisation TISA provides enhanced cooperation between technologies and support for a single coherent development plan. Where new Conditional Access (privately run, paid access) TMC services are introduced to replace public services, quality is often increased but accessibility can be strongly reduced and this will continue to be the case if governments do not take the required steps to support free services. In MSs where clear digital broadcast infrastructure plans are not in place, deployment of advanced TPEG services will be delayed.

In the **motor vehicle type-approval legislation** domain, the EC has started a process to make Brake Assist Systems and Electronic Stability Control mandatory in the next years. Activities within public policy and regulatory framework have been started for other applications that regulation might become feasible, such as basic blind spot monitoring and conspicuity systems, daytime running lights, run flat indicators, seat belt reminders, and alcolocks for drunk driving violators.

Standardisation issues are considered for several areas of eSafety. Noticeable work is being undertaken at the standardisation level to identify the needs and ready documents for approval by standardisation bodies.

As for the **guidelines for facilitating market introduction of intelligent integrated safety systems**, Member States and the relevant industry actors were supposed to implement the HMI principles of the updated ESoP before December 2007. However, until now, take-up is patchy at best. Although the automotive industry is reasonably well informed, these principles are generally unknown to and ignored by a large part of the nomadic device industry. It is difficult to assess the awareness of and compliance with the ESoP HMI principles by the vehicle and portable device industries.

As for the activities undergoing in the regulatory field for **Short Range Radar**, a set of decisions that regulate the 24GHz and 76-77 GHz band. Take-up of the technology has been lower than anticipated and a review of the regulatory structure is needed. Considering that the technology for the 76-77 GHz band will not be mature and cost-effective by the 2013 deadline, and take-up of 24 GHz SRR has been slow, a review of a possible frequency shift to 26.x GHz (frequency range 22.25 to 29 GHz) is needed. Therefore standardisation work will actually become a priority.

Several projects have produced different methodologies for the **impact assessment** of IVSS (SEiSS, eIMPACT, TRACE, PReVAL, CODIA; eIMPACT extends the SEiSS methodology; PReVAL and eIMPACT use the same safety impact assessment methodology; CODIA developed the methods further for cooperative systems). The application of these methodologies to the different systems has allowed the consolidation of a list of priority systems and policy development at European and national levels. As all systems were not covered by these studies and the methods were not fully compatible, the list is not exhaustive, however. The ASTE feasibility study concluded that performance testing is economically and technically feasible. The next step is for suppliers to agree on standardised test methods. More research must also be done on driver behaviour and driver modelling. Other requirements include the development of performance testing methods, and consensus on how performance testing should be encouraged, managed and controlled.

So far there has been no progress on the process of paving the way to the introduction of instruments such as **financial and tax incentives** at European scale, due principally to the lack of a clear cost-benefit analysis and to the obstacles represented by the European legal framework.

There is still a lack of positive **business cases** for several eSafety priority systems, such as eCall, RTTI, and Cooperative systems. For both public and commercial services a successful business model is necessary, and it's compulsory to develop it to enable the deployment of the systems.

Until now, a majority of **awareness actions** organised at European level were aimed at decision-makers and less at users. eSafetyAware! started targeting car users and end users with the ChooseESC campaign, focussing on ESC, but promotion on other mature eSafety systems is still absent. Press attendance to the events is a priority and needs to be stimulated. Although eSafety has been covered by most of the European press, and the benefits of specific systems have been promoted in newspapers and specialised magazines (including online versions), there is still a need to get closer to the end user. This could include mass media involvement (TV and radio) and the production of didactic, concise and well -targeted TV series or documentaries specifically dedicated to ICT-based systems.

There is a real need for the informative tools aimed at users to be simple (but not simplified too much), more emotional than technical and to explain clearly what the technology is about and which practical benefits they convey. The safety consciousness is what has to be risen. Further campaigns could be proposed for mature eSafety technologies already available on the market. Car dealers and new drivers are being targeted. Progress must be noted in the involvement of automobile clubs which also have a role to play in users' outreach. The eSafety Interactive Car, deployed by eSafety Support in September 2007, with the aim of showing the functioning and the benefits of eSafety systems has been very positively welcomed as a didactic and complete tool. This tool has been displayed during each event eSafety Support took part in or organised. Still, the idea of integrating it in the stakeholders' websites hasn't' been fully achieved. At the same time, the European Commission, integrated in its website another interactive car and an interactive eSafety quiz, translated in several languages.

The **eSafety Forum** has been successful in its role of fostering stakeholder activities supporting research and deployment of eSafety systems as well as influencing policies. New working groups are created as soon as there is a raising need. New priorities endorsed by the Forum are the support of the development of a cooperative infrastructure, foster the passage of eSafety to other applications (such as ICT for Clean and Efficient Mobility), and provide a vision of 3rd generation systems and services.

The following table summarises the progress for each of the recommendations, using the simplified colour code introduced in section 1.1 to view of the current status. The tables keeps into account the status of each recommendations tracked in the previous editions of this progress note. For specific details on the progress of each recommendation, please refer to the correspondent section covering the recommendation.

Table 8 – Summary of the progress of each recommendation

Topic	N.	Recommendation	Progress end 2007	Progress mid 2008	Progress end 2008
Accident Causation Data	1	Consolidate analyses from the existing EU, Member State and industry road accident data which give information on the cause and circumstances of the accidents, for allowing the determination of the most effective countermeasures, starting from the most frequent accident types.			
	2	Define a common format and structure for recording accident data in the EU countries. Develop jointly an *European Accident Causation Database* covering all EU and enlargement countries, and provide open access to industry and public agencies.			
Impact Assassment	3	Develop methodology to assess the potential impact of intelligent integrated road safety technologies in Europe, based on the accident causation data. This work should also analyse combined systems (fusion of sensors, integration and use of multiple active safety systems together). Develop validation methodology and procedures for vehicles equipped with Intelligent Integrated Road Safety Systems.			
	4	Set up a coordinated validation framework for operational tests for active safety systems in the Member States.			

Human-Machine Interaction	5	Assess the reports by the Member States on the Commission Recommendation "Statement of Principles on safe and efficient in-vehicle information" and communications systems", and decide on further actions as necessary taking into account the rapid development in this area. The use of portable (nomadic) devices requires urgent assessment of risks.			
	6	Develop workload assessment, testing and certification methodology and procedures for complex in-vehicle working environments involving interfacing with in-vehicle devices for vehicle control, driver assistance, intelligent integrated road safety, including Multi-Media systems.			
Implementation Road Maps	7	a) Develop regularly reviewed Road Maps with technical steps and economic implications for the introduction of Intelligent Integrated Road Safety Systems. These Road Maps should indicate the technical and economic capability of the stakeholder industries to deploy intelligent integrated safety solutions. b) The public sector Road Maps should indicate the investments required for improvements in the road networks and information infrastructure based on the industrial Road Maps, and identify the steps needed for removing regulatory barriers.			

Intelligent Integrated Road Safety systems	8	Analyse existing accident causation data and possible countermeasures, and determine clear goals and priorities for further RTD in Intelligent Integrated Road Safety Systems in industrial research, Community Research (Integrated Projects in the 6th FP) and national research programmes.			
	9	Identify existing specifications, and where necessary develop new specifications for pan-European, standardised interoperable interfaces and communications protocols for vehicle-to-vehicle and vehicle-infrastructure communications which will support interactive, co-operative safety systems and services, including Traffic and Travel Information.			
	10	Pursue international co-operation in the development intelligent integrated road safety technologies. The co-operation should cover especially Human-Machine Interaction, certification and testing methodology and procedures, harmonisation standardisation, legal issues, impact and socio-economic benefit analysis, and benchmarking/best practise.			

Digital Map Database	11	Based on existing research results, define requirements for a European digital road map database. This database should contain in addition to road map data agreed road safety attributes for driver-support for information and warning purposes, such as speed information and road configuration data. Create a public-private partnership to produce, maintain certify and distribute this digital road map data base. It should be made available for all users at affordable prices (possibly free of charge). National, local and regional authorities and operators should provide safety-related data on road configurations within their networks, with target dates for implementation.			
Emergency calls and E-112[15]	12	After consultations (telecommunications authorities, civil protection authorities, industry through CGALIES) adopt a Commission Recommendation on the introduction and implementation of E-112 service in Europe.			
	13	Establish a European Emergency Communications Forum to continue the CGALIES work and to monitor the implementation of E-112 service in the Member States. Establish national liaison groups to co-ordinate the implementation and building up of the E-112 service chain.			

[15] Recommendation 14 on eCall was updated by Dr. Wolfgang Reinhardt, ex co-chair of the eCall DG, to reflect the updated priorities and roll-up plan for eCall.

	14	For in-vehicle emergency calls (e-Calls), establish data requirements and data transfer protocol for e-Calls originating from vehicles. Establish an interface specification and routing and handling procedures for e-Calls with location and other accident-related information.			
Real-Time Traffic and Travel Information	15	Analyse the Member States' responses to the TTI Recommendation, draw up further safety-related actions and make a progress report to the Council and the European Parliament			
	16	Create public-private partnerships to capture, process and provide real-time traffic, travel and road condition data from a variety of sources, including Floating Vehicle Data			
	17	Support the wider use of the pan-European RDS/TMC network for safety-related traffic information. Provide a report with required actions to the European Commission on the status of RDS/TMC implementation and the remaining bottlenecks.			
Regulation	18	Determine what actions may be required for rapidly bringing forward road safety improvements obtainable with Intelligent Integrated Road Safety Systems in vehicles.			

Standardisation and certification	19	Analyse the specific needs and priorities of the intelligent integrated road safety systems for standardisation in ISO, CEN and ETSI. For vehicle-to-vehicle and vehicle-infrastructure communications, promote the accelerated standardisation of emerging communications protocols. For CEN, based on the recently published report of the M270 mandate, choose the appropriate mechanisms (Committee Working Agreements, full EN standards), and establish the necessary working groups.			
Legal issues of market introduction	20	Develop a methodology for risk benefit assessment, achieve an industrial and societal consensus on a European Code of Practice, and establish guidelines for facilitating the market introduction of Intelligent Integrated Road Safety Systems.			
Ultra-wide band 24 GHz short range radar[16]	21	Take the necessary actions for early review of regulatory conditions to the use of short-range radar (SRR) in Europe, taking into account the proposal for a frequency shift to a centre frequency around 26.5 GHz for UWB.			
	22	Undertake the standardisation in ETSI for the 24.25-29 GHz UWB radar.			

Societal issues	23	Estimate the socio-economic benefits which can be obtained through the reduction of fatalities, injuries and material damage by the introduction of Intelligent Integrated Road Safety Systems. This should include an analysis of the reduction in medical care and other expenses in the Member States and enlargement states, and benefits like improved journey times and reduced congestion and environmental impact.			
	24	Stimulate and support road users and fleet owners to buy vehicles with intelligent road safety functions and to use safety-related services by incentives such as tax reductions, lowering insurance premiums, and preferential treatment. This support should target especially the buyers who choose to equip their vehicles with co-operative safety systems, thus helping to create an initial market demand for advanced safety systems.			
The Business Model	25	Identify best practices for positive business cases to promote the introduction of Intelligent Integrated Road Safety Systems, including analysis of the required bundling of the functions, priorities for market introduction, co-funding schemes, and public private partnership.			
	26	Support the e-Call business model by implementing the full service chain and ensuring inter-operability, compatibility with E-112 systems and direct links to infrastructure operators and vehicle breakdown services. Training of personnel has to be provided for.			

User outreach	27	Design and execute awareness campaigns which explain the benefits, functioning and use of the Intelligent Integrated Road Safety Systems to the consumers.			
Creation of eSaefty Forum	28	Create a eSafety Forum with the objective to monitor and promote the implementation of these recommendations, and to support the development, deployment and use of intelligent integrated road safety systems. Determine its objectives, Terms of Reference, draft a Memorandum of Understanding and organisation. Establish membership and work programme.			

Chapter 4 - ACKNOWLEDGEMENTS

The author of this report and the eSafety Support team would like to thank for the help provided in completing the information about the progress in the different areas (in alphabetical order): James Burgess (ERTICO), Sophie Dupuis (ERTICO), Maxime Flament (ERTICO), Lina Konstantinopolou (ERTICO), Risto Kulmala (VTT), Dolf Lamerigts (ACEA), Wolfgang Reinhardt (ACEA), Alan Stevens (TRL).

Appendix A - LIST OF INDICATORS

Accident Causation Data

1) Consolidate analyses from existing EU, Member State and industry road accident data.
2) Develop jointly a European Accident Causation Database covering all EU countries, and facilitate access to it.

Indicators
1.1) Consolidated analyses from existing accident and risk exposure data sources
1.2) Development of the definitions and methodologies supporting the creation of the data base
2.1) Establishment of a common format for recording accident data
2.2) Definition of sources and collection of data
2.3) Completeness of the accident causation database

Impact Assessment

3) Develop a methodology to assess the potential impact of intelligent integrated road safety technologies in Europe. Develop a validation methodology and procedures for vehicles equipped with intelligent integrated road safety systems.
4) Set up a coordinated validation framework for operational tests for active safety systems in the Member States.

Indicators
3.1) Creation of a methodology to assess the impact of IIVSS
3.2) Creation of a methodology to validate vehicles equipped with IIVSS
4.1) Creation of a methodology for operational tests in the Member States
4.2) Field Operational Tests in the Member States

Human Machine Interaction

5) Assess the reports by the Member States on the Commission recommendation, and decide on further actions. Urgent action is needed to assess the risk of portable (nomadic) devices.

6) Develop workload assessment, testing and certification methodology for complex in-vehicle working environments.

Indicators
5.1.a) Updating of the actions to undertake to take into account the fast development in the HMI area
5.1.b) Implementation of the actions contained in the recommendations
5.2) Assessment of the risk of nomadic devices
6) Development of a workload assessment, testing and certification methodology for the HMI

Implementation Road Maps

7a) Develop Road Maps with technical steps and economic implications for the introduction of intelligent integrated road safety systems in Europe.

7b) The public sector Road Maps should indicate the investments required for improvements in the road networks and information infrastructure.

Indicators
7.1) Creation of the Road Maps
7.2) Timeliness of the Road Maps

Intelligent Integrated Road Safety Systems

8) Analyse existing accident causation data and possible countermeasures and determine clear goals and priorities for further RTD.

9) Where necessary, develop specifications for interfaces and communications protocols for vehicle-to-vehicle and vehicle-to-infrastructure communications.

10) Pursue international cooperation

Indicators
8) Goals identified for future RTD
9) Frequency allocation, interfaces and communication protocols: specifications developed
10.a) Activities coping with International Cooperation
10.b) Coverage of international countries
10.c) Coverage of eSafety topics

The European Road Safety Maps database

11) Define requirements for a European digital road map database, with agreed road safety attributes. Create a public-private partnership to produce, maintain certify and distribute this database.

Indicators
11.1.a) Definition of a safety-enabled map format
11.1.b) Definition of an incremental updating mechanism to increase the map updating frequency
11.1.c) Definition of a standardized interface in the vehicle between maps database and ADAS applications
11.1.d) Definition of public-private road data exchange infrastructure
11.1.e) Definition of new safety attributes capturing mechanisms
11.2.a) Availability and accessibility of road safety data at European level
11.2.b) Level of introduction of road safety attributes in the available digital maps

Emergency calls and E-112[17]

12) Adopt the Commission Recommendation on the introduction and implementation of E-112 in Europe.

13) Establish a European Emergency Communications Forum to continue the CGALIES work.

14) For in-vehicle emergency calls (e-Calls), finalize standardization efforts for MSD, operating requirements (CEN) and transport/communication protocols/data bearer (ETSI), high-level application-protocol and quality of service standards (CEN). Develop guidelines to establish national roll-out platforms and form working clusters to exchange best practices and speed up implementation of both infrastructure and in-vehicle eCall systems. Agree on clear roll out timing.

Indicators
12, 13, 14) Level of fulfilment of the milestones of the eCall Road Map

Real-time traffic and travel information

15) Analyse the Member States' responses to the RTTI Recommendation and draw up further actions.

16) Create public-private partnerships to capture, process and provide real-time traffic, travel and road condition data including Floating Vehicle Data.

17) Support the wider use of the pan-European RDS/TMC network for safety-related traffic information. Provide a report with required actions to the European Commission on the status of RDS/TMC implementation and the remaining bottlenecks.

Indicators
15.1) RTTI (TMC) coverage in Europe
15.2) Drafting/Adoption of a common implementation strategy for the geographic extension of RTTI services, working to European standards
15.3) Actions to ensure roaming and inter-operability of RTTI services across the EU with clearly defined accessibility to services for roaming devices
16) Creation of PPPs to capture, process and provide real-time traffic, travel and road condition data
17.2) Action supporting the wider use of the pan-European RDS/TMC network for safety-related traffic information
17.2) Report to the European Commission on the status of TMC implementation

and bottlenecks

Motor-vehicle and type-approval legislation

18) Determine what actions may be required for bringing rapidly forward road safety improvements obtainable with intelligent integrated road safety systems in vehicles.

Indicators
18) eSafety systems for which legislative instruments have been released to permit their introduction

Standardisation and Certification

19) Analyse specific needs and priorities of intelligent integrated safety systems for standardisation in ISO, CEN and ETSI. Promote accelerated standardisation.

Indicators
19.a) Topics currently matter of discussion at standardisation level
19.b) Approved standards

Legal issues of market introduction

20) Develop a methodology for risk-benefit analysis, achieve a consensus on a European Code of Practice, and establish guidelines for facilitating market introduction of intelligent integrated safety systems.

Indicators
20.a) Creation of a European Code of Practice and achievement of a consensus
20.b) Deployment of guidelines for facilitating market introduction of intelligent integrated safety systems

UWB 24GHz SRR[18]

21) Take the necessary actions for early review of regulatory conditions to the use of short-range radar (SRR) in Europe, taking into account the proposal for a frequency shift to a centre frequency around 26.5 GHz for UWB.

22) Undertake the standardisation in ETSI for the 24.25-29 GHz UWB radar.

Indicators
21) Deployment of regulation tools
22) Standards released

Societal Aspects

23) Estimate the socio-economic benefits, which can be obtained through the reduction of fatalities, injuries and material damage.

24) Stimulate and support road users and fleet owners to buy vehicles equipped with intelligent road safety systems.

Indicators
23) Estimation of socio-economic benefits:: eSafety systems covered
24) Incentives schemes implemented

The different business cases

25) Identify best practices for positive business cases to promote the introduction of intelligent integrated road safety systems.

26) Support the eCall business model by implementing the full service chain and ensuring interoperability and compatibility with E-112.

Indicators
25.a) Availability of business models
25.b) Number of positive business cases (based on a cost-benefit analysis)
26) Actions supporting the building of a positive business case for eCall

User Outreach

27) Design and execute awareness campaigns that explain the benefits, functioning and use of the intelligent integrated road safety systems to the consumers.

Indicators
27.1) Bodies supporting the organisations of campaigns
27.2) Technologies campaigned

The eSafety Forum

28) Create an eSafety Forum with the objective to monitor and promote the implementation of these recommendations, and support the development, deployment and use of intelligent integrated road safety systems.

Indicators
28.a) Creation of an eSafety Forum
28.b) Activities undertaken to support the development, deployment and use of IIRSS