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**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"**

1. PURPOSE AND SCOPE OF THIS COMMUNICATION

The present Communication is an answer to the need of the citizen, the industry and the Member States to solve transport related societal problems and improve Information and Communication Technologies (ICT) take up. **The Communication presents the Intelligent Car Initiative as a policy framework for actions in this area.** The Intelligent car initiative is composed of 3 pillars: the eSafety Forum, the ICT research programme and the awareness raising actions.

2. INTRODUCTION

On 1 June 2005 the Commission adopted the initiative “i2010¹: European Information Society 2010 for growth and employment” as a comprehensive strategy for modernising and deploying all EU policy instruments to encourage the development of the digital economy. i2010 consists of three pillars: a Single European Information Space, Innovation and Investment, and an Inclusive European Information Society. The “Intelligent Car” is one of the 3 Flagship initiatives proposed within the third pillar with the **objective to raise the visibility of the vital contribution of ICT to the quality of life.** The “Intelligent Car Initiative” on smart, safe and clean transport, focuses on road vehicles and addresses safety and environmental challenges caused by increased road use.

3. RATIONALE: WHY A EUROPEAN INITIATIVE ON THE INTELLIGENT CAR?

There are an estimated 300 million drivers in the EU Member States, who wish their driving to be easier with less trouble, less delay, and less chance of getting injured. Of all daily activities, driving is crucial as our entire life could change in an instant or even end because of a road accident. The present activity responds to the need to move towards a new situation, where cars don't crash anymore, and traffic congestion is reduced. The pollution of the environment, traffic safety and congestion are truly European problems affecting all 25 Member States and therefore, European solutions need to be found.

3.1. Description of the Problem

Modern societies depend heavily on mobility, but transport entails severe problems, such as congestion of road networks and urban areas, harmful effects on the environment and public health, waste of energy and, above all, accidents which cause fatalities, injuries and material damage.

In the EU, **Congestion** costs amount to 50 billion € per year or 0.5 % of Community GDP, and by 2010 this figure could go up to 1% of EU GDP. The number of cars per thousand persons has increased from 232 in 1975 to 460 in 2002. The overall distance travelled by road vehicles has tripled in the last 30 years and, in the last decade, the volume of road freight grew by 35% contributing to 7 500 km or **10 % of the network being affected daily by traffic jams².**

¹ COM(2005) 229 final: “i2010 – A European Information Society for growth and employment”

² source DG TREN.

Concerning **energy efficiency** and **emissions**, in 2002 the transport sector consumed 338 million tonnes oil equivalent (MToe) representing 31% of the total energy consumption in the EU. Road transport consumed 281 MToe, or 83% of the energy consumed by the whole transport sector. Road transport CO₂ emissions account for 835 million tonnes per year representing 85% of the total transport emissions³. Investigations show that **up to 50% of fuel consumption is caused by congested traffic situations and non optimal driving behaviour**.

Of all transport problems, **Safety** is the one with the most serious impact on the daily lives of citizens. It also has a high impact on most of the socio-economic indicators. With its “White Paper”⁴ of September 2001, the European Commission set the target to half road fatalities by 2010. Although the situation has improved thanks to the road safety action programmes⁵, there are still over 40.000 fatalities on the Euro 25 roads every year, with 1.4 million accidents with a cost of around 200 billion €/year representing 2% of the EU GDP⁶. Concerning the causes of accidents, current research⁷ indicates that human error is involved in almost 93% of accidents and that, in almost three-quarters of the cases, the human mistake is solely to blame. As an example, a recent study⁸ concluded that if we have an accident when driving at a speed of 50 km/h and we could brake half a second earlier, we could reduce the crash energy by 50%, but an analysis of German accidents showed that 39% of passenger vehicles and 26% of trucks do not activate brakes before a collision and some 40% more do not brake effectively, **underlying our limits as drivers**.

3.2. The potential of intelligent cars

Information and Communication Technologies (ICT), which enable building Intelligent Cars, provide new intelligent solutions that contribute to solving the key societal challenges described above by increasing road safety, the overall efficiency of the transport systems and by contributing to a more efficient use of fuel. These intelligent systems can assist the driver in the driving functions preventing or avoiding accidents, they can provide drivers with real time information about the road network avoiding congestion, and they can optimise a journey or the engine performance improving overall energy efficiency. These intelligent systems address the interaction between the driver, the vehicle and the road environment, in an integrated approach where the autonomous on-board systems are complemented with vehicle-to-vehicle and vehicle-to-infrastructure co-operative technologies and improved traffic network management.

³ source EUROSTAT

⁴ COM(2001) 370 final “WHITE PAPER: European transport policy for 2010: time to decide”

⁵ COM(2003) 311 final: European Road Safety Action Programme Halving the number of road accident victims in the European Union by 2010: A shared responsibility COM(2003) 542 Final: Information and Communications Technologies for Safe and Intelligent Vehicles

⁶ source EUROSTAT

⁷ GIDAS database

⁸ source HELLA presentation AMAA 2004

What is the potential of these intelligent systems?

Why should the EU propose a plan to raise their awareness?

- The SeiSS study⁹, estimated that if all vehicles were equipped with **eCall** (emergency call automatically triggered by the vehicle in case of an accident) by 2010 a reduction in fatalities between 5% and 15% could be achieved in the EU saving up to a maximum of 22 billion €. Moreover, **eCall** could reduce congestion times between 10% and 20% with additional cost savings of between 2 to 4 billion €.
- The same study estimated that **Adaptive Cruise Control (ACC)** that performs longitudinal control (thus avoiding rear-end collisions) could save up to 4.000 accidents in 2010 if only 3% of the vehicles were equipped.
- In the case of **Lateral Support** (lane departure warning and lane change assistant) 1.500 accidents could be saved in 2010 given a penetration rate of only 0.6%, while a penetration rate of 7% in 2020 would lead to 14.000 fewer accidents.
- AWAKE, a project that developed a **Driver hypovigilance system**, estimated that a warning to the driver in case of drowsiness could play an important role in avoiding 30% of fatal crashes on motorways and 9% of all fatal accidents.
- The SMART NETS project demonstrated that improved software and real-time traffic data in urban traffic control centres could lead to better **traffic management** and achieve a reduction of up to 40% in traffic standstill and congestion, thus resulting in considerable energy savings.
- Other systems like “speed alert”, “**alcohol-lock**” and “**charging systems**” can have also, under certain circumstances, an important impact on cleaner, safer and more efficient transport.

3.3. Need for action at European Level

Considering the problems described, it appears that intelligent car systems could contribute substantially to overcome some of the current transport problems. Unfortunately, despite their potential, most of these intelligent systems are not yet on the market and the vehicles that are fitted with telematics or with new generation active safety features are mainly luxury cars representing a small percentage of the market. For some successful active safety systems, for example, large-scale deployment faced several problems and took very long periods of time. This has been the case with the introduction of the ABS¹⁰ (20 years); the ESP (10 years to reach 40% of market penetration) and ACC (more than 25 years since the start of the development phase and yet a very low penetration rate). The main reasons are legal barriers, the extremely competitive situation of the automotive sector with narrow margins and low return on investment, the high cost of intelligent systems and the consequent lack of customer demand, the lack of information, throughout society, about the potential benefits of these systems and a clear business case.

⁹ Exploratory Study on the potential socio-economic impact of the introduction of Intelligent Safety Systems in Road Vehicles: SeiSS final report.

¹⁰ ABS: Antilock Braking System; ESP: Electronic Stability Programme; ACC: Adaptive Cruise Control

A survey done by EUROTTEST¹¹ on a representative sample of almost 2800 drivers showed that only half the drivers surveyed were familiar with existing basic in-vehicle technologies providing active and passive safety (only 50% of them, for example, knew what an antilock braking system (ABS) does.). The same survey also concluded that “more needs to be done, on both the European and national level, **to raise the awareness about safer, cleaner and more economical driving**”. Citizens and policy makers cannot be expected to invest or promote technology unless its benefits and usefulness are clear. In order to stimulate the users’ demand for intelligent car systems, it is therefore important to establish a consistent awareness raising programme being careful not to create distortion of competition in the after-market or false expectations on systems capabilities

Moreover, European transport problems need harmonised solutions at European level. Bottlenecks to market implementation need to be removed, product demand needs to be stimulated and consensus needs to be built among key players. The eSafety Forum underlines that the wide-spread take-up of Intelligent Car Systems cannot depend on the private business case only. This take-up needs the full support of the public sector especially in the initial phase of market penetration of mature technologies, if they contribute to solving European societal problems and represent excellence in innovation. The Cars21¹² initiative that focuses on a competitive automotive regulatory system for the 21st Century also identifies eSafety as a key initiative to reach the objective of reducing fatalities on European roads. The Intelligent Car links to Cars21 and complements it through a number of awareness raising actions and research. The actions proposed in the present Communication will also contribute significantly to the overall reduction in the emission of pollutants and would help industry to fulfil its commitment to reduce average new car CO₂ emissions to 140 g/km in 2008.

To ensure interoperability and the harmonisation of technical solutions throughout the Union, a comprehensive European approach is needed. In addition to standardisation and in line with the ongoing work on co-operative systems, public authorities have a particular role in the implementation of the appropriate infrastructures, including intelligent features, and putting forward targeted actions enabling the wider deployment of ITS.

Further action is needed in **research and development**. During the last decades, major investments have been made in Europe in the use of ICT for intelligent vehicle technologies, also thanks to the European Framework Programmes. Several technologies contributing to higher road and vehicle safety, less congestion and more rational energy consumption were developed and tested in these programmes. Additional efforts are needed to follow up the appropriate research priorities activities developed so far by focusing on assessment programmes and refinement of technologies and systems to make them smarter, cheaper and more reliable. It is also important to maintain European industry competitiveness towards Japan and the US where similar research programmes exists.

4. OBJECTIVES

The three needs for action at European level in the area of intelligent cars as identified above, define the following objectives of the Intelligent Car Initiative:

¹¹ <http://www.eurotestmobility.net/eurotest.php?itemno=86&lang=EN>

¹² For more on the CARS 21 initiative and to download the final report, see <http://europa.eu.int/comm/enterprise/automotive/pagesbackground/competitiveness/cars21.htm>

- (1) Coordinate and support the work of relevant stakeholders, citizens, Member States and the Industry, in the Intelligent Car Initiative.
- (2) Support research and development in the area of smarter, cleaner and safer vehicles and facilitate the take-up and use of research results.
- (3) Create awareness of ICT-based solutions to stimulate users' demand for these systems and create socio-economic acceptance.

5. ACTIONS PROPOSED

5.1. Support and co-ordinate the work of the Member States and of the other relevant stakeholders.

The first objective of the Intelligent Car Initiative is implemented with the support of the eSafety Forum. The eSafety Forum activities are described in two Commission Communications on eSafety¹³. The Forum aims at removing the bottlenecks that prevent Intelligent Vehicle Systems entering the market, through consensus building among stakeholders and recommendations to the Member States and the EU. It was established in 2003 and has now over 150 members representing all road safety stakeholders. It has established so far eleven industry-led Working Groups that work on priority topics. The Forum has produced a consistent number of valuable reports that constitutes an important input for industrial initiatives and policy activities. The Forum will ensure the links with parallel and complementary activities in the domain of intelligent transport systems like Cars21, the European Road Safety Action Programme in particular the European Road Safety Charter¹⁴, the "Intelligent Transport Systems for logistics and intermodality" initiative announced in the Community Lisbon Programme and, in the field of the environment, the European Climate Change Programme working group on light vehicles¹⁵. As the Intelligent Car Initiative develops, the Commission will consider extending the activities of the eSafety Forum to cover ICT for cleaner as well as safer transport.

The Forum becomes one of the pillars of the Intelligent Car Initiative and it will be the essential link to decision makers.

Within the first objective of the Intelligent Car Initiative, the eSafety Forum will continue to support the Commission through its working groups. In addition, the following specific actions are proposed:

- (1) Follow up and report on the specific actions proposed in the 2nd eSafety Communication "Bringing eCall to Citizens" mainly in relation to the signature of the eCall Memorandum of Understanding by the Member States, the state of implementation of the single emergency number 112 and E112, the status of the PSAPs (Public Service Answering Points) upgrading for the handling of location-enhanced E112 calls and eCalls and on the provision of adequate location-enhanced emergency services and language support.

¹³ COM(2003) 542 Final: Information and Communications Technologies for Safe and Intelligent Vehicles and COM/2005/0431 final The 2nd eSafety Communication - Bringing eCall to Citizens

¹⁴ <http://europa.eu.int/comm/transport/road/roadsafety/rsap/charter.htm>

¹⁵ http://forum.europa.eu.int/Public/irc/env/eccp_2/library

- (2) Produce Commission Recommendation on the design and safe use of Human Machine Interfaces (HMI) for intelligent vehicles systems. The recommendation updates the Commission Recommendation of 21 December 1999 on safe and efficient in vehicle information and communication systems, taking also into account the evolution of technology during the past 5 years.
- (3) 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.
- (4) To address the issues of spectrum needs in the context of vehicle-to-vehicle communication and to organise a workshop to discuss **spectrum implications**¹⁶ of the Intelligent Car Initiative. The spectrum needs require coordination with the proper bodies at an early stage of technical development to ensure the necessary frequency band availability.
- (5) To follow up the recommendation on the establishment of a European Code of Practice for the development and testing of Advanced Driver Assistance Systems¹⁷.

5.2. Research and development in the area of smarter, cleaner and safer vehicles

The Intelligent Car Initiative activities build upon the achievements and results of EU Framework Programmes on research and technological development¹⁸.

The long-term objectives of the Intelligent Car Initiative can only be achieved through co-operative research and will be part of the ICT priority in FP7: **ICT meeting societal challenges**, contributing to the development of ICT-based transportation systems and services enabling people and goods to move safely, ecologically, comfortably and efficiently. The research priorities of the Intelligent Car fully support the ERTRAC¹⁹ (European Road Transport Research Advisory Council) strategic research agenda. Within the second objective of the Intelligent Car the following actions are proposed:

- (6) Co-operative Research in Europe has allowed system suppliers and car manufacturers to develop active safety systems to mitigate or avoid accidents. **Future research** in this area should continue the work done so far and look at the needs for the next generation of driver assistance systems, such as enhanced performance, reliability, security and reduced fuel consumption, including potential risks of Electromagnetic compatibility failure, based on cheaper, smarter and faster components.

¹⁶ Pursuant to Decision 676/2002/EC of the European Parliament and of the Council on a regulatory framework for radio spectrum policy in the European Community (Radio Spectrum Decision)

¹⁷ results of RESPONSE 3 part of the PREVENT integrated project <http://www.prevent-ip.org/>

¹⁸ <http://www.cordis.lu/ist/so/esafety-road/home.html>

¹⁹ <http://www.ertrac.org/>

Under FP6 a first group of projects looking at the potential of vehicle-to-vehicle and vehicle-to-infrastructure communication have been launched. Further **research on co-operative systems** is needed to evolve from basic conceptual models towards integrated systems enabling functional testing and validation to take place.

Traveller and traffic information have become key services for improving access to transport services. Open platforms are under development enabling travellers to access information in a seamless way. Market uptake is slow and further RTD is needed to overcome issues linked to business cases and user acceptability.

ICT research should also help to achieve **transport across transport modes**, in particular in the case of freight transport where increased capacity management has a direct impact on fuel consumption. ICT should also help to overcome the economical barriers of multi-modal transport by improving the overall information flow.

The research mentioned above, needs to be complemented with actions demonstrating the benefits and use of intelligent vehicle systems.

- (7) Establishment through FP7 of a comprehensive, technical and socio/economic **assessment program, based on Field Operational Tests (FOT)** to assess in real environments the impact of ICT-based Intelligent Car systems on driver behaviour and on driving dynamics. The FOT will also serve as the basis for a cost-benefit analysis of advanced, intelligent systems and for an overall assessment of their impact on traffic safety and on the efficiency of the transport system.

The deployment of these systems requires the commitment of the automotive industry and investments in the infrastructure that is under the responsibility of public authorities. Any engagement from their side will be based on impact assessment studies, where costs/benefits play an important role. The FOT will provide real operational data to carry out this analysis. The programme should target close-to-the-market systems that can rapidly be made available in a sufficiently large fleet of vehicles. The results of the Assessment programme will strongly depend on the commitment, involvement and participation of the Member States in the identification, setting-up and follow-up of the tests. The same applies for the work on co-operative systems, where the road operators, both urban and inter-urban, play a key role in achieving the expected benefits.

- (8) Support and promote the setting up of an **independent conformance testing and performance assessment programme** in the EU, by using the existing means and capacity available in major European research centres. Whereas in the field of passive safety and emissions there are clear testing methods to verify design performance (i.e. crash worthiness), harmonised performance testing methods of ICT based systems do not exist. It is therefore urgent to start the reflection on criteria and methods to measure their performance. A number of European test centres have gained a lot of experience on performance testing of ICT based traffic safety and efficiency systems, and a comprehensive initiative can be started in close co-operation with the automotive industry, its suppliers, European Standards Organisations, Member States and EuroNCAP²⁰. The initiative will include the launching of a feasibility study which

²⁰ European New Car Assessment Programme: www.euroncap.com

will investigate the most appropriate methodology for testing and the organisational structure of the programme. In the second phase, a project could be started in FP7 for the proper application of the methodology, to carry out preliminary performance tests and to link with the standardisation bodies.

5.3. Create awareness of ICT based solutions for intelligent Cars

The awareness pillar of the Intelligent Car Initiative will promote, active information dissemination to a wide audience to raise drivers and policy maker's knowledge about the potential of intelligent vehicle systems, stimulate user's demand and create socio-economic acceptance. The following specific actions under the third objective of the Intelligent Car Initiative are proposed:

- (9) Hold appropriate and regular “**Intelligent Car Initiative Events**”. These events aim at maximising media attention through result-oriented activities e.g. demonstration days, Integrated Projects road shows, showcases, workshops.
- (10) Support and launch targeted activities to raise intelligent car systems awareness including the production of short, well targeted **TV series or documentaries** on specific ICT based systems, and 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.
- (11) Promote the establishment of an “**eSafety Communication Platform**” with the aim to improve, coordinate and harmonise the end-user communication of the different stakeholders. This platform has been proposed by the User Outreach Working Group of the eSafety Forum. In this working group a number of industrial partners identified the need to establish a formal organisation as a prerequisite for raising user awareness at EU level. This work will make use of best practise toolbox and pilots for user campaigns to be tested in several Member States.
- (12) Support and promote with the i2010 branding and other targeted actions, **stakeholders' initiatives** which pursue the objectives of the Intelligent Car Initiative

5.4. Monitoring of the Intelligent Car Initiative

In order to measure the progresses of the Intelligent Car Initiative a **monitoring exercise** will be put in place at European, national and industrial level, focusing on specific indicators to regularly assess the progress on the proposed actions.

6. CONCLUSIONS

The present Communication focuses on the third pillar of the i2010 initiative, the building of an inclusive European Information Society that offers better quality of life and improved public services. It proposes an Intelligent Car Initiative with three specific objectives: Coordination of the work of stakeholders through the eSafety Forum, supporting research and development and raising the user's awareness about intelligent vehicle systems and their potential benefits, and to accelerate their deployment in the market.

The Communication emphasises the strategic importance of Information and Communication Technologies, which enable building of smarter, safer and cleaner vehicles that help to solve the road transport related societal problems. It presents the Intelligent Car Initiative as the policy framework that will guide the stakeholder's efforts in this area, aiming at accelerating the deployment of intelligent vehicle systems on the European and other markets through clearly defined actions that encompass the use of policy, research and communications instruments.

The Member States are key stakeholders of the Intelligent Car Initiative. The Commission invites the Member States to support the objectives expressed in this Communication, and stresses the need to act together at the European level. To this effect, the Member States are invited to play an active role in the execution of the proposed actions, together with the Commission, industry and other stakeholders.