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COMMISSION STAFF WORKING DOCUMENT

Extended impact assessment on Information and Communications Technologies for Safe and Intelligent Vehicles

(COM(2003) 542 final)

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1. WHAT ISSUE/PROBLEM IS THE POLICY/PROPOSAL EXPECTED TO TACKLE?

1.1.What is the issue/problem in a given policy area expressed in economic, social and environmental terms including unsustainable trends?

Mobility and transport is a concern for citizens throughout Europe; there are 375 million road users in the EU. Modern society depends on mobility, which provides personal freedom and access to services for business and leisure. From society's point of view, an efficient transport system is the engine of our economy, and the transport sector is of huge economic importance; it employs more than 10 million people and accounts for more than 10% of the Gross Domestic Product (GDP) of Europe.

A key industry in the transport sector is the automotive industry, which manufactures about 17 million vehicles per year and employs, together with its suppliers, close to 2 million people in Europe. The world-wide annual turnover of the automotive industry is 452 billion €. The automotive telematics market, comprising the sales of telematics platforms and of services, is experiencing rapid growth in market penetration. According to some market studies it will achieve an annual revenue as high as 8,5 billion € in Europe in 2007, up from 1 billion € in 2000. As the number of vehicles incorporating telematics increases, the market will shift towards services, further integrating the automotive market with two other key industrial sectors in Europe: Mobile Communications and Information Technology.

For a long time, the demand for transport services has grown steadily for both goods and passengers. Most of this growth has taken place in road transport, which has been able to increase capacity and offer competitive services. It is estimated that some 80% of personal travel (calculated in passenger-km) is currently by car, and that 44% of the market for transporting goods is by road. Between 1970 and 2001, the number of vehicles in the Community grew from 62.5 million to over 205 million, and the total number of vehicles is now increasing by more that 3 million every year.

The continuing growth in economic activity in both the present members of the Union and the new Member States will increase the need for mobility and transport services. The estimated increase in demand for transport by 2010 will be 38% for goods services and 24% for passengers in the EU of 15. Most of this growth is expected to be taken up by the road sector, and is likely to further increase congestion of both the main road network and urban areas. This will increase the harmful effects on the environment, and above all increase accidents, thus causing fatalities, injuries and material damage. At the same time, tight public budgets are expected to restrict investment in the infrastructure.

The problems caused by road transport are not only socio-economic ones, but concern each and every citizen in their daily lives. **The 1.300.000 accidents per year in Europe cause 40.000 fatalities and 1.700.000 injuries, at an estimated cost of 160 Billion €, or 2 % of GDP[1].** On a personal level, these accident figures indicate that one third of us will be injured in an accident at some point of our lives. The psychological damage to the victims and their families is enormous.

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[1] White Paper on European Transport Policy for 2010: Time to decide, adopted by the Commission in September 2001

One of the possible measures to tackle this major problem of European dimension is to accelerate the development and deployment of advanced, active in-vehicle and co-operative safety systems based on Information and Communications Technologies. These systems, called Intelligent Vehicle Safety Systems, when deployed on a sufficiently large scale, are expected to make a major contribution to reducing the fatalities, serious injuries and accidents on European Roads, and to provide for a basic need for Europe's citizens: safe mobility.

This Commission Working Document presents an analysis of the various policy options for the potential Commission actions intended to accelerate the development, large-scale deployment and use of Intelligent Vehicle Safety Systems in Europe.

1.2.What are the risks inherent in the initial situation?

Vehicles today are safer, cleaner and more recyclable than before. Thanks to improvements in the crash-worthiness of the vehicles, safety belts, ABS and other inventions, the vehicles are now four times safer for their users than in 1970; this has contributed to reducing by 50% the number of deaths in EU 15 since 1970 while traffic volumes have tripled during the same period.

However, during the most recent years the number of fatalities has shown only a very slight reduction (see Table 1), while the number of accidents has actually increased. The effect of the current measures appears to be reaching its limits, and new measures are urgently required. Overall, it can be concluded that without further measures the number of fatalities will remain at the current level, which is unacceptable.

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	Total
B	1.873	1.671	1.660	1.692	1.449	1.356	1.364	1.500	1.397	1.470	***1.486***	**16.918**
DK	606	577	559	546	582	514	489	499	514	***498***	431	**5.815**
D	***11.300***	***10.631***	***9.949***	***9.814***	***9.454***	***8.758***	***8.549***	***7.792***	***7.772***	***7.503***	***6.977***	**98.499**
EL	2.112	2.158	2.159	2.253	2.411	2.157	2.105	2.182	2.116	2.037	*1.895*	**23.585**
E	8.836	7.818	6.376	5.614	5.749	5.482	5.604	5.957	5.738	5.777	5.516	**68.467**
F	10.483	9.900	9.867	9.019	8.891	8.541	8.444	8.918	8.487	8.079	8.160	**98.789**
IRL	445	415	431	404	437	453	473	458	414	418	412	**4.760**
I	8.109	8.053	7.188	7.091	7.020	6.676	6.713	6.314	***6.633***	***6.410***	6.140	***76.617***
L	83	69	78	65	70	71	60	***57***	***58***	***70***	***69***	**750**
NL	1.281	1.253	1.235	1.298	1.334	1.180	1.163	1.066	1.090	***1.082***	***1.085***	**13.067**
A	***1.551***	1.403	1.283	1.338	1.210	1.027	1.105	963	1.079	976	958	**12.893**
P	3.218	3.084	2.700	2.504	2.711	2.730	2.521	2.126	2.028	1874	1.671	**27.167**
FIN	632	601	484	480	441	404	438	400	431	396	433	**5.140**

S	745	759	632	589	572	537	541	531	580	591	583	**6.660**
UK	4.753	4.379	3.957	3.807	3.765	3.740	3.743	3.581	***3.564***	***3.580***	***3.598***	**42.467**
TOTAL	**56.027**	**52.771**	**48.558**	**46.514**	**46.096**	**43.626**	**43.312**	**42.344**	**41.901**	**40.761**	**39.684**	**501.594**

Table 1: Road Accident Fatalities in Europe 1991-2001. Source: CARE Database[2]

1.3.What is the underlying motive?

This need for further measures is motivated by three underlying issues: societal, industrial and consumer.

The White Paper on European Transport Policy for 2010, adopted by the Commission in September 2001 sets a very ambitious goal for Europe – to halve the number of deaths due to road accidents by 2010.

The White Paper recognises that, although responsibility for taking measures to achieve this target will principally fall to the national and local authorities, the European Union needs to contribute to this objective through a number of its own actions, including the promotion of new technologies to improve road safety. Technological progress and new technologies are expected to make a major contribution towards the goal of the White Paper.

On the industrial side, a major responsibility for introducing a new generation of Intelligent Vehicle Safety Systems in vehicles lies with the automotive industry. This industry is developing these systems in collaboration with its suppliers in the telematics industry and is supported by two other main industrial sectors: the telecommunications and IT industries.

However, the private sector can not act on its own. The public sector has to work together with the private sector in a concerted way, as was pointed out by the industry-led eSafety Working Group[3]. The Working Group concluded that the European Commission has to act, especially in relation to its competencies such as Community RTD, vehicle type-approval procedures, telecommunications regulation, and in solving liability, standardisation and other obstacles, in the introduction of Intelligent Vehicle Safety Systems.

Europe's citizens should be able to expect a common level of safety and support from the road infrastructure for their mobility over the whole of Europe, just as they can for the safety features of vehicles. Further European level actions are required to define and harmonise Member States' technical requirements and investments in road and communications infrastructure, especially those required by the future collaborative road safety systems. This approach has been endorsed by the High-Level Group on Road Safety, consisting of Member States' representatives.

1.4.What would happen under a "no policy change" scenario?

Under a "no policy change" scenario the number of fatalities in EU 15 could be expected to remain on the current level, and the goals set in the White Paper on European Transport

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2 http://europa.eu.int/comm/transport/home/care/index_en.htm

3 The Final Report of the eSafety Working Group on Road Safety, November 2002, see http://europa.eu.int/information_society/programmes/esafety/index_en.htm

Policy for 2010 cannot be achieved during the remaining years (2003-2010). Consequently it can be concluded that further measures are urgently required, and that "no policy change" is not an option.

Under the "no policy change" scenarion, any positive development which could be achieved by improved safety measures in the Member States, the efforts of the industry to continuously improve the passive safety and crashworthiness of the vehicles, and by the limited introduction of Advanced Driver Assistance Systems, is largely counteracted by the following factors:

- Increasing vehicle numbers (about 3 million new vehicles per year)
- Upward trend in the use of the vehicles (kilometres per vehicle per year)
- Growing economic activity, leading to increasing traffic demand
- Enlargement, which will further increase the traffic demand especially in freight in the EU 15 countries, and also brings new problems

The measures examined in this Working Document have to be seen in the general framework of road safety. The policy initiatives include the already adopted 3rd Road Safety Action Programme, and the measures for promoting new technologies discussed here.

1.5.Who is affected?

Mobility, transport, and road safety are issues that affect each and every citizen in Europe, and involve major industrial sectors. Furthermore, since safety is a shared competence in the European Union, in addition to the European Commission, the Council, the European Parliament and the individual Member States, a large number of other public sector stakeholders at national, regional and local level are also affected. To reiterate:

- There are 375 million road users in the EU. Modern society depends on mobility, which provides personal freedom and access to services for business and leisure.
- The transport sector is of huge economic importance, employing more than 10 million people and with an expenditure of more than 10% of the Gross Domestic Product (GDP) in Europe.
- A key industry in the transport sector is the automotive industry, which manufactures about 17 million vehicles per year and employs, together with its suppliers, close to 2 million people in Europe. World wide it has a turnover of 452 billion €.
- The automotive telematics market, comprising of sales of telematics platforms and services is experiencing rapid growth, and according to some market studies will reach an annual revenue as high as 8,5 billion € in Europe in 2007, up from 1 billion € in 2000.
- As the market shifts towards telematics and services, the automotive industry will become increasingly dependent on two other key industrial sectors in Europe: Mobile Communications and Information Technology.

Other affected stakeholders include local authorities, road authorities, road safety organisations, automobile clubs, fleet operators, the insurance industry, motorway operators, emergency services and the police.

2. WHAT MAIN OBJECTIVE IS THE POLICY/PROPOSAL EXPECTED TO ACHIEVE?

2.1.What is the overall policy objective in terms of expected impacts?

Road Safety is one of the main political priorities of the European Community. The main objective of the policy options examined in this Working Document is to the contribute to the goal established in the White Paper on European Transport Policy for 2010, which is to reduce by half the number of road fatalities by 2010. In absolute terms, this goal means less than 20.000 fatalities in current Europe of 15 Member States in 2010.

This objective is further elaborated in the 3rd European Road Safety Action Programme[4]. This action programme gives a comprehensive list of actions for all road safety stakeholders, the European Union, Member States, regional level actors and the private sector. Commitment and concerted actions by all these stakeholders are required for achieving the goal set in the White Paper. These actions fall into the following categories:

(1) Encouraging road users to improve their behaviour

(2) Using technical progress to make vehicles safer

(3) Encouraging the improvement of road infrastructure

(4) Safe commercial goods and passenger transport

(5) Emergency services and care for road accident victims

(6) Accident data collection, analysis and dissemination

It is generally estimated that actions under category 2, using technical progress to make vehicles safer has the potential to offer a major contribution towards the White Paper goal. This contribution cannot, however, be reliably estimated at the current state of technological progress and market penetration of the emerging new vehicle safety systems, furthermore the industry is facing legal and economical barriers in introducing them. This Commission Working Document presents an analysis of the various policy options which would facilitate the progress in this area.

2.2.Has account been taken of any previously established objectives?

Objectives regarding road safety have been established in the White Paper on European Transport Policy for 2010 and in a number of Action Plans, Recommendations and Communications. The following are of direct relevance to the considerations in this Working Document:

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[4] European Road Safety Action Programme : Halving the number of road accident victims in the European Union by 2010 : A shared responsibility, COM 2003(311) final 2.6.2003

The eEurope 2002 Action Plan

The eEurope 2002 Action Plan was adopted by the European Council in June 2000. In the domain of Intelligent Transport Systems, one of its main targets was to ensure that by end of 2002 all new vehicles sold in Europe would be equipped with more effective active safety systems.

The Commission, especially DGs INFSO and ENTR, have worked closely with the automotive industry and other stakeholders in promoting this goal through, for example, RTD actions, Communications and Recommendations. Significant progress has been achieved. It has, however, become evident that the promotion of road safety in Europe through the use of active safety and new technologies requires a partnership approach and co-ordination by all the partners of their actions.

For this reason, the European Commission, together with other stakeholders, decided to establish **the eSafety Initiative** as a public-private partnership which aims to increase road safety in Europe by accelerating the development, deployment and use of active safety systems based on new Information and Communications Technologies.

The White Paper on European Transport Policy for 2010

The White Paper "European Transport Policy for 2010: time to decide", adopted by the Commission in September 2001 lists improving road safety amongst the principal measures proposed within the policy guidelines. It also makes explicit referenceto the (eEurope 2002) target mentioned above. Furthermore, the White Paper sets a specific target regarding road safety, which is to reduce by half the number of road fatalities by 2010.

This very ambitious goal is the main underlying motive for considering further Commission measures in the are of road safety.

Pedestrian Protection

During 2001 the Commission successfully concluded negotiations with the associations representing the European, Japanese and Korean automobile manufacturers concerning a commitment by the industry to introduce measures to increase pedestrian protection. The industry commitment was presented by the Commission in a Communication to the Council and the European Parliament for their opinion[5].

Following the results of the consultation with the European Parliament and the Council, the Commission decided that legislation should be proposed in this area in order to establish the major aims and the fundamental technical provisions. A proposal for such a Directive was adopted by the Commission on 19 February 2003[6].

The commitment by industry also includes a timetable for the introduction of other safety improvements, including the following active safety elements:

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5 Communication from the Commission to the Council and the European Parliament COM(2001)389 of 11.7.2001

6 Proposal for a Directive of the European Parliament and of the Council relating to the protection of pedestrians and other vulnerable road users in the event of a collision with a motor vehicle and amending Directive 70/156/EC (COM(2003)67 final), 19.2.2003

– anti-lock braking systems (ABS) in all new motor vehicles from 1 July 2004;

– equipment allowing the use of daytime running lights from 1 October 2003 (however this measure has now been postponed, following the consultation with the European Parliament and the Council); and

– installation, progressively, of additional active safety devices in all new motor vehicles.

The list annexed to the commitment includes 14 possible active safety systems. The measures examined in this Working Document, aiming to contribute to improving road safety at accelerating the development, deployment and use of these active safety systems in road vehicles, could also contribute towards the safety of pedestrians and other vulnerable road users.

European Road Safety Programmes

Two European Road Safety Programmes, administered by DG TREN, have already been completed, and a third programme is starting:

– The 1st European Road Safety Programme (1993-1997)

This programme introduced the classification of road safety measures involving infrastructure, vehicles and users, and brought forward legislative actions (e.g. Whole Vehicle Type Approval and carriage of dangerous goods). It also promoted research on vehicle safety and introduced the CARE database for road accident information in the EU Member States.

– The 2nd European Road Safety Programme (1997-2001)

This programme acknowledged the complexity of the road safety system in which the human factor is a key element, and advocated increasing safety through information, accident prevention and damage limitation, including improved vehicle design with passive safety measures, as well as improved infrastructure. In an effort to develop consumer awareness, support was also provided to the EuroNCAP Programme which was introduced to complement the type-approval system.

– The 3rd European Road Safety Action Programme (2002-2010)[4]

This Action Programme was adopted by the Commission in June 2003, and endorsed by the Transport Council on 5 June 2003. The 3rd Action Programme proposes an overall European Strategy and framework for actions to be undertaken at Member State and regional level in the timeframe 2003-2010. It includes measures such as improved enforcement, collection and analysis of accident and injury causation data (accidentology), education and training programmes, information to consumers and Member States, infrastructure investments for road safety, and cost-benefit and impact assessment studies.

The 3rd Road Safety Action Programme and this policy proposal are largely complementary. They share a common policy objective and provide contributions from different perspectives to the same overall target.

The eSafety Initiative and the eSafety Working Group

The considerations in this policy proposal are based on the work and consultations done within the eSafety Initiative and the eSafety Working Group, see Chapter 6.

3. WHAT ARE THE MAIN POLICY OPTIONS AVAILABLE TO REACH THE OBJECTIVE?

3.1. What is the basic approach to reach the objective?

General approach

Road accidents, injuries and fatalities can be substantially reduced by the use of Information and Communications Technologies, applied in in-vehicle and co-operative safety systems.

Intelligent Vehicle Safety Systems which use Information and Communications Technologies (ICT) are particularly useful in the pre-crash phase when the accident can still be avoided or at least its severity significantly reduced. With these systems, which can operate either autonomously on-board the vehicle, or be based on vehicle-to-vehicle or vehicle-to-infrastructure communication (co-operative systems), the number of accidents and their severity can be reduced, leading to a reduction in both the number of fatalities and of injuries.

The potential contribution that could be made by the introduction of Intelligent Vehicle Safety Systems to road safety and security has already been demonstrated by the automotive industry in a number of European research and technological development (RTD) projects. However, to realise these potential benefits, the new systems have to be widely deployed in the marketplace. It is therefore of paramount importance that the public and private sectors work together in accelerating the development and deployment of these systems in Europe, and all actors, including the European Commission, take appropriate actions.

This general approach requires a framework and strategy, specific actions related to the introduction of new technologies for improving road safety, and establishing a mechanism for promoting and monitoring the actions of all safety stakeholders:

– The 3rd Road Safety Action Programme sets the general strategy and framework for improving road safety in Europe.

– This Working Document examines the policy options for the specific measures aimed at accelerating the development, deployment and use of new (Information and Communications) technologies for improving road safety in Europe.

– This Working Document also examines options for monitoring the progress in implementing of the identified actions by all stakeholders, and mechanisms for drafting proposals for further measures as necessary.

Standardisation

Standardisation is one of the measures which, within the general framework described above, is expected to contribute to accelerating the take-up of new technologies in the automotive sector. Standardised solutions guarantee wide market acceptance, higher volumes and lower costs, benefiting all consumers.

Within Europe there are three formal European Standards Organisation, CEN, CENELEC and ETSI.

CEN and CENELEC are the European Standardisation Committee and the European Committee for Electrotechnical Standardisation, respectively. They have the responsibility of promoting voluntary technical harmonisation in Europe in conjunction with world-wide bodies, and other standardisation partners in Europe. They have technical committees (TC)

and working groups (WG) covering the full range of standards work. CEN is primarily responsible for the work on road transport, and within the ITS sector the relevant technical committee is TC 278 – 'Road Transport and Traffic Telematics'. Under TC 278 there are currently 13 WGs. Voting on draft standards within CEN is weighted according to the GDP- of the countries.

The global equivalent of CEN is the International Organisation for Standardisation (ISO) which promotes the development of voluntary standards to facilitate the international exchange of goods and services. Within the field of ITS, the lead technical committee is TC 204 (Intelligent Transport Systems), which has 7 active WGs and 23 sub-committees. TC 204 liases closely with TC 22 (Road Vehicles) and with CEN TC 278. ISO voting is vote per country.

ETSI, the European Telecommunications Standards Institute, develops standards for the needs of the telecommunication/electronic communication community. The telecommunications as well as radar standards are under the responsibility of ETSI ERM (EMC and Radio Spectrum matters). While ETSI develops radio standards, the allocation of frequencies are under the responsibility of the CEPT/ECC. Its global equivalent is the International Telecommunications Union (ITU-R). Both CEPT/ECC and ITU-R deal with radio frequency Spectrum allocation issues. ETSI co-operates with CEPT/ECC under a MoU.

In 1999, the Commission issued a mandate to the three European standardisation organisations (CEN, CENELEC and ETSI) to prepare a draft programme for European standardisation in the ITS area. The report and recommendations have now been published[7]. International collaboration and strengthening liaisons between CEN and ISO are required especially with respect to vehicle standards, architecture, wide-area communication systems and traveller information systems. These standardisation efforts form an essential part of the general approach, and the instrument to be chosen has to be suitable for promoting the standardisation actions.

3.2.Which policy instruments have been considered?

The range of measures that the European Commission could undertake was identified by the eSafety Working Group, and published in it Final Report in November 2002. The immediate task of the Commission is, on the basis of this report and other consultations, to take appropriate action, seen by the industry and other road safety stakeholders as the crucial next step in accelerating the development, deployment and use of Intelligent Integrated Road Safety System.

A distinction between short-term and long-term actions has to be made. On the short term (2003-2004) , the policy instrument to be chosen has to be appropriate for promoting a set of measures, as the first step. Essentially a monitoring mechanism has to embedded into the selected policy option, allowing considering further actions and the use of a full set of instruments available as required for obtaining the long-term objective (from 2005 onwards).

At this stage, the Commission has to select the most appropriate instrument for the short-term for implementing the identified set of measures as the next step in promoting road safety with new technologies. The following instruments have been considered:

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[7] http://www.cenorm.be/standardization/tech_bodies/cen_bp/workpro/tc278.htm

Commission Communication

A Communication from the Commission to the European Parliament and the Council allows the Commission to inform the other institutions about the set of measures it intends to take on the basis of the consultations with interested parties from all sectors, representing the common interest of the citizens and the sectors involved. A communication can be seen as a particularly well suited instrument for proposing a set of measures for promoting road safety with new technologies, as the set of measures is very diverse, and the technologies being developed and deployed, and their impact, are not yet sufficiently understood or mature for them to be effectively mandated via legislation, or subject to further recommendations or other measures.

On the basis of the consultation with the stakeholders, most importantly the work done in the eSafety Working Group (See Chapter 6), the following set of measures were included in the draft Commission Communication to allow further analysis of the policy options:

A. Promoting Intelligent Vehicle Safety Systems

(1) Support the eSafety Forum, aiming at a self-sustained platform

(2) Determining clear goals and priorities for further RTD under its 6th Framework Programme, and pursue co-ordination with national programmes.

(3) Determining what further actions are required on Human Machine Interaction.

(4) Promoting harmonised, pan-European in-vehicle emergency call (e-Call) service that builds on the location-enhanced emergency call E-112.

(5) Analysing the progress made in the provision of Real-Time Traffic and Travel Information (RTTI) in Europe, and proposing further actions.

B. Adapting the regulatory and standardisation provisions

(6) Taking the necessary steps to support the removal of legal barriers to the use of 24 GHz UWB short-range radar.

(7) Reviewing the relevant parts of the existing EC vehicle type-approval legislation.

(8) Analysing the needs and priorities of standardisation in ISO, CEN and ETSI.

C. Removing the societal and business obstacles

(9) Estimating the socio-economic benefits.

(10) Supporting the development of a European Code of Practice.

(11) Promoting the elaboration of Industrial Road Maps and the corresponding Public Sector Road Maps.

Commission Recommendation

Examples of recently published Recommendations in areas related to road safety are the Recommendations on Human-Machine Interaction[8], on Real-time Traffic and Travel Information (RTTI)[9] and on the implementation of call processing and handling for location-enhanced (E-112) emergency calls[10]. As can be seen from these examples, a Recommendation is n instrument particularly suited for promoting a set of measures on a clearly defined topic with a clear objective and set time frame. Although this instrument may not be the best option for achieving the short-term goals in promoting road safety with new technologies, it is clear that further Recommendations may be considered in the future.

Legislative actions

Within Europe there is an established type approval regime for motor vehicles and their components/systems. Under this regime, once a vehicle or component has been type approved against a set of technical provisions, it must be permitted to be marketed in every country that applies those provisions, without any further testing being required. In the EU, those technical provisions are contained in Directives, which are applicable to every Member State.

Before new passenger cars and motorcycles can be placed on the market within the European Union they must have obtained whole vehicle type approval against a specified set of directives. Those directives cover both safety and environmental aspects of the vehicle (e.g. braking systems, emissions, etc.).

The EU legislation is regularly up-dated to take account of technical progress, and wherever possible to remove requirements that would prevent new technologies being applied in vehicles. For example, steps are now being taken to amend the relevant legislative acts to enable the use of "steering-by-wire" and new types of adaptive headlamps that can direct the light into a corner.

Generally new solutions are coming forward in all areas of motor vehicle design based on new technologies including information and communication technology (ICT), and the electronic content in motor vehicles is increasing dramatically. It has been possible to integrate these new technologies without major legislative obstacles.

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8 Commission Recommendation of 21 December 1999 on safe and efficient in-vehicle information and communication systems: A European statement of principles on human machine interface Text with EEA relevance (notified under document number C(1999) 4786), published in the OJ L 19 on 25.1.2000

9 Commission Recommendation on the development of a legal and business framework for participation of the private sector in deploying telematics-based Traffic and Travel Information (TTI) services in Europe, OJ L 199/20 24.7.2001

10 Commission Recommendation on the processing of caller location information in electronic communication networks for the purpose of location-enhanced emergency call services, 2003 [check the reference]

There is also the forum of the United Nations Economic Commission for Europe (UN/ECE), which prepares regulations which contracting parties to either the 1958[11] or 1998[12] agreements may apply. The European Community is a Contracting Party to these agreements and many of the regulations prepared under the 1958 agreement are accepted as alternatives to the directives prescribed for Whole Vehicule Type Approval.

In the general framework of improving road safety with new technologies, future legislative actions arez not specifically excluded. Should any of the new systems be considered to represent a significant risk or benefit to road safety, the Commission reserves the right to respectively prohibit or mandate such systems. These very strict measures can, however, be considered only when the impact of the prohibition or mandating has been reliably established with appropriate testing and validation. Any such legislation would have to be compatible with existing legislation, and form part of the type-approval legislation concerning vehicle safety and environmental protection that is already well established in the automotive sector.

Voluntary commitment

The European Commission also acknowledges that non-legislative market initiatives must be pursued in order to bring forward improvements in vehicles. As a supplement to the EU legislative acts the European, Japanese and Korean car manufacturers have, for example, committed themselves to further reduce the level of CO_2 emissions from vehicles and to introduce measures to reduce the fatalities and injuries of pedestrians. It can be foreseen that similar approaches could be used in the case of Intelligent Vehicle Safety Systems.

However, in the case of pedestrian protection, the European Parliament has requested a Framework Directive[13] to ensure legal certainty in the provision of the voluntary commitment. Therefore, the use of this instrument has to be considered on a case by case basis, when the technologies and systems being considered become mature, and paying attention to the institutional framework.

3.3.What are the trade-offs associated with the proposed options?

Table 2 summarises the principal trade-offs associated with the different instruments:

Policy option / Instrument	**Trade-offs**
Do nothing	Even in no policy change scenario, the industry could be expected to introduce on the markets new in-vehicle safety systems. Due to the lack of a positive business case, the pace of market introduction would be dictated solely by competition and would be very slow, as shown by the introduction of ABS and ESP in the vehicles. Relying solely on

[11] E/ECE/324-E/ECE/TRANS/505 Rev.2 Agreement Concerning the Adoption of Uniform Technical Prescriptions for Wheeled Vehicles, Equipment and Parts which can be Fitted and/or be used on Wheeled Vehicles and the Conditions for Reciprocal Recognition of Approvals Granted on the Basis of these Prescriptions.

[12] ECE/TRANS/132 - Agreement Concerning the Establishing of Global Technical Regulations for Wheeled Vehicles, Equipment and Parts which can be fitted and/or be Used on Wheeled Vehicles.

[13] Proposal for a Directive of the European Parliament and of the Council relating to the protection of pedestrians and other vulnerable road users in the event of a collision with a motor vehicle and amending Directive 70/156/EEC, COM(2003) 67 final, 19.02.2003

	the automotive manufacturers' business case leads also to introduction of the new safety features in the high-end range of vehicles first, then into the mid-range vehicles and finally to the small and compact cars. As a consequence the drivers most at risk, i.e. the young, are the last to benefit, as they tend to drive the older and smaller cars. Consequently, these positive impacts would be largely counteracted by the other factors explained in Chapter 1.4, and there would be only a minor contribution towards the goal set in the White Paper on European Transport Policy for 2010.
Commission Communication	A Commission Communication is seen as a very good instrument for communicating to all stakeholders, including the other institutions and the Member States the set of measures the Commission is intending to take. The principal trade-off is that the progress of many of the proposed measures is dependent upon the co-operation of the various stakeholders. This co-operation can only be ensured if the industry, Member States and other stakeholders are required to reach solutions by particular dates. It is therefor crucial to establish also a monitoring mechanism, and reserve the right to follow the Communication with other measures such as recommendations and regulation if the take-up of the markets is reluctant.
Recommendation	The wide domain and the diversity of the proposed measures would imply using a set of Recommendations, instead of a single Communication. This is considered impractical at this stage. However, issuing recommendations on specific topics can be considered later.
Legislative actions	Within Europe there is an established type approval regime for motor vehicles and their components/systems. The EU legislation can be up-dated to take account of technical progress, and for example to mandate or prohibit certain safety systems. It has to be noted that this mechanism is not particularly fast, taking typically from 5 to 6 years to implement. Furthermore, mandating the features on vehicles could significantly increase the cost of vehicles and restrict the further development of new products. Also, before this can be considered, the technologies being considered, and their positive and negative impacts on road safety sufficiently understood or mature. This is not the case with the new Intelligent Vehicle Safety Systems. Consolidated data of their impact, reliability and efficiency is not available. As we are talking about a large number of potential technologies, this is a very complex issue. As a conclusion, the use of regulation is immature as an instrument for the next step. The measures to be taken now can, however, be seen as prerequisite for further actions also on the regulatory side.

Voluntary commitment	A voluntary commitment can be seen as a measure complementing the regulatory approach, to be used either stand-alone or in combination with the Directives. Its principal advantage is that it potentially leads to faster implementation. The need to proceed with caution and to understand the impact of the technologies also prevails in the case of voluntary commitments. The use of this instrument should be considered on case by case basis.

Table 2: Principal trade-offs of the considered policy instruments

3.4.How are subsidiarity and proportionality taken into account?

The role of European Union

With a single transport market and road travel rapidly expanding, a systematic approach is needed to reduce the high costs of road accidents and the inequalities between Member States. This approach will call for co-ordinated action, focused on common objectives, covering the local, regional, national and Community levels. Joint action is warranted to deal with common road safety issues, to raise greater awareness and to implement the most effective measures at the different levels.

The White Paper on European Transport Policy stresses two essential points as regards the Community's role in the field of road safety:

– firstly, its long-standing contribution in the context of the establishment of an internal EU market without unfair competition,

– the legal means provided by the Maastricht Treaty which enables the Commission to establish a framework and to take measures.

The means of action available to the European Union

The European Union has a number of ways in which it can act on road safety.

- Article 71 of the EC Treaty allows the European Union to **legislate** to adopt measures to improve transport safety, within the limitations of subsidiarity. It has established competence in several areas such as seat belt use in cars, the periodic technical inspection of motor vehicles, roadside checks, tachographs, speed governors, the weights and dimensions of vehicles, the transportation of hazardous goods, driving licences and certain aspects of driver training. It has more than one competence in some areas, such as the technical harmonisation of vehicle standards where it is required to ensure a high level of protection (Article 95 of the Treaty). It may lay down safety requirements for the trans-European road network.[14] The legislation will have to be adjusted to achieve the Community's road safety objective and to take account of the technical progress made in the areas covered. Articles 151 and 152 (health and consumer protection) also allow the EU to take action in this connection.

[14] In accordance with European Parliament and Council Decision 1692/96/EC of 23 July 1996 on Community guidelines for the development of the trans-European transport network (OJ L 228, 9.9.1996, p.1).

- The European Union has **financial means** which enable it, through targeted calls for proposals, to support initiatives to generate a higher sense of awareness among policy makers, professionals and the public at large about the main safety issues and the solutions required.

- The European Union has so far played an important part in **the establishment and dissemination of best practices**

- The **collection and analysis of data on accidents** and physical injuries is essential to be able to make an objective evaluation of road safety problems, to identify the priority fields of action and to monitor the effects of the measures. At a later stage, the data should make it possible to quantify the benefits achieved through the new technologies. The European Union has played an active part in the definition of accident investigation methods (STAIRS project) and the creation of the CARE database.[15]

- The definition and evaluation of future policy requires considerable and sustained **research and technological development**, against a background of on-going technological and social change. At the same time, it is essential to translate knowledge derived from previous research into action which will save human lives. It will be necessary to strengthen research activities in the field of road safety, in particular in the context of the Sixth Research Framework Programme, as well as **the basic studies, including socio-economic studies, and demonstration projects**.

- The Commission believes that **fiscal incentives** could be an important way of encouraging private and business investment and promoting the design of safer infrastructure and vehicles. The incentives should relate to certain categories of equipment with proven effectiveness in terms of safety for which it would be difficult to find outlets without incentives. At all events, fiscal incentives must comply with the rules governing the internal market.

- By analysing experience at national level, the Commission will consider how to encourage the introduction of **safety requirements in public service contracts**. The Commission will propose harmonised criteria in calls for tender for public procurement.

- Last, but by no means least, collaboration is needed with the European insurance sector to try to find new ways of improving road safety, in particular by **spreading the costs of risks associated with accidents causing bodily injuries** more fairly, through the adjustment of insurance premiums.

- The importance of the socio-economic aspects of road safety should be stressed. In purely accounting terms, it is clear that the measures do not all have the same cost-effectiveness ratio, but even the most expensive ones do have a favourable ratio. A systematic analysis will help to show the effectiveness of a broad range of measures to improve road safety and increase investment.

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[15] Council Decision No 93/704/EC of 30 November 1993 on the creation of a Community database on road accidents (OJ L 329, 30.12.1993, p. 63).

4. WHAT ARE THE IMPACTS – POSITIVE AND NEGATIVE – EXPECTED FROM THE DIFFERENT OPTIONS IDENTIFIED?

4.1. What are the expected positive and negative impacts of the options selected?

The policy options

On the basis of the trade-off analysis above, it is clear that only two options can be reasonably compared and analysed: A Commission Communication versus the "No policy change" option. The other options, such as recommendations and regulation may come into the play later, but they cannot be used for proposing the set of measures which constitute "the first phase package" in accelerating the development, deployment and use of Intelligent Vehicle Safety Systems for improving road safety. This analysis is based on the set of draft measures shown in Table 3:

No	Action
1	To facilitate co-operation of all stakeholders, the Commission will continue to support the eSafety Forum, aiming at a self-sustained platform.
2	The Commission will determine clear goals and priorities for further RTD under its 6th Framework Programme, and pursue co-ordination with national programmes.
3	The Commission will determine what further actions are required on Human Machine Interaction.
4	The Commission will promote harmonised, pan-European in-vehicle emergency call (e-Call) service that builds on the location-enhanced emergency call E-112.
5	The Commission will analyse the progress made in the provision of Real-Time Traffic and Travel Information (RTTI) in Europe, and propose further actions.
6	The Commission will take the necessary steps to support the removal of legal barriers to the use of 24 GHz UWB short-range radar.
7	The Commission will review the relevant parts of the existing EC vehicle type-approval legislation.
8	The Commission will analyse the needs and priorities of standardisation in ISO, CEN and ETSI.
9	The Commission will estimate the socio-economic benefits.
10	The Commission will support the development of a European Code of Practice.
11	The Commission will promote the elaboration of Industrial Road Maps and the corresponding Public Sector Road Maps.

Table 3: Draft measures for Commission Communication

Conclusions

The principal positive and negative impacts of these two options are analysed in Table 4. From the analysis provided in the table it is evident that, compared to “no policy change” the policy option Commission Communication demonstrates clear positive impact on all issues (economic, environmental and societal), and only a few negative effects.

The Commission Communication is therefore proposed to be chosen as the preferred policy option.

	Description	No policy change	Commission Communication
Economic impacts			
Impact on the international competitiveness of the European automotive industry	The automotive industry is a key industry in the transport sector, manufacturing about 17 million vehicles per year and employing with its suppliers close to 2 million people in Europe, with a turnover of 452 billion € world-wide. The automotive market is one of the most competitive in the world, competing with U.S., Japanese and Korean manufacturers..	There is currently no positive private business case for most of the new intelligent vehicle safety systems. The systems are seen as increasing manufacturing cost, with weak customer demand. To remain profitable, the automotive industry is introducing these systems on new models only on the basis of the competitive situation, and is not taking the lead. On the long-term basis this weakens the industry's competitiveness vs. main competition especially Japanese manufacturers.	Positive impact. The measures contribute to the competitiveness of the industry on a number of major ways: (1) Supporting research and development these systems, leading to lower RTD costs and faster development, (2) supporting standardisation leading to wider harmonised markets, (3) facilitating their rapid market introduction by adapting the relevant regulations and removing barriers, (4) contributing to a joint public-private business case e.g. with incentives and (5) increasing user awareness.
Impact on competitiveness of other European industrial sectors	The important players are equipment suppliers and telecom and IT industries. The amount of electronic sensors, components and subsystems is already considerable, and this is a growing market. As the car parc of vehicles with telematics platforms grows, the market will shift towards value-added services. However, the market of intelligent vehicle safety systems is still very small compared to other in-vehicle sub-systems and the comfort systems, such as Multi-media and navigation systems.	The reluctant take-up of the intelligent vehicle safety systems on European markets may lead to slowing down RTD efforts, and loosing benefits of larger markets. The position of Europe in international standardisation is also weakened. Overall, the competitiveness of European equipment suppliers and telecom and IT industries weakens compared to the players on more dynamic markets.	Positive impact. The telecom and IT industries and the equipment suppliers benefit from the measures mentioned above, especially as regards RTD and standardisation. The provision of these services and systems represents new market areas and opportunities for increasing sales, contributing to the long-term competitiveness of these industrial sectors
Impact on the price of automobiles and penetration on the markets	The safety benefits of intelligent vehicle safety systems can only be realised with sufficient penetration on the markets. However, the cost of these systems can	Relying only on the automotive manufacturers' business case will lead to very conservative introduction strategy. Obtaining significant market penetration	Positive impact. The measures which contribute mostly are (1) support to standardisation leading to wider harmonised markets and lowering

	be prohibitive. For example, the price of a collision mitigation or adaptive cruise control system is around 2000€.	levels can take a very long time, as is shown by the introduction of ABS and ESP. This also leads to introduction of the new safety features in the high-end range of vehicles first, and as a consequence the drivers most at risk, i.e. the young, are the last to benefit. The industry also lacks the benefits of volume markets, which will keep the prices high.	costs, (2) contributing to a joint public-private business case e.g. with incentives and (3) increasing user awareness, increasing market demand.
Environmental impacts			
Impact on sustainability	Steady and unobstructed vehicular traffic flows (which respect upper speed thresholds) are widely considered to have a beneficial effect on automotive emission levels, as compared to stop-and-go traffic and infrastructure design and speed limitation devices which impose frequent acceleration and deceleration actions. Active safety technologies --in particular intelligent cruise control and, in the future, intelligent speed adaptation--, hold the promise of smoothing out unnecessary flow fluctuations, thus resulting in better emission control and reduced vehicle operating costs.	The increasing demand of mobility and road transport services will evidently lead to a deterioration of environmental conditions, if strict measures first of all for emission controls but also applying ITS and in-vehicle technologies for congestion mitigation and demand management are not applied.	Positive impact. The proposed measures which aim at increasing road safety also contribute to more environmentally-friendly driving (see the Appendix 1). Introduction of vehicles equipped with these systems, such as ACC, should improve traffic flow and thus have a positive environmental impact. The impact of these measures to demand of mobility services is thought to be neutral.
Impact on traffic congestion and efficiency of traffic network	Advanced vehicle safety and infrastructure support technologies reduce the occurrence and severity of accidents on major roads and motorways. Since most of these accidents occur during peak traffic and/or vacation periods, they tend to result in the creation of non-recurrent	Increasing demand for mobility without matching capacity improvements via ITS systems and services will lead to deterioration in the efficiency of transport services and degradation of environmental conditions, thus generating consumer dissatisfaction,	Positive impact. Reduced occurrence of incidents and non-recurring congestion on major roads and motorways, which can be achieved via advanced vehicle safety and infrastructure support technologies, can improve network conditions. There will be much less secondary

	congestion which has highly detrimental effects on network flows.	public opposition and societal concerns.	effects created on the network, especially during peak-hours and vacation periods, namely less built-up congestion and fewer queue-tail accidents, thus improving throughput, speed and flow homogeneity, and increasing end user comfort and convenience.
Social impacts			
Impact on road accidents, injuries and fatalities in Europe and world-wide.	There are currently 1.300.000 accident every year in the European Union roads (EU 15), causing 40.000 fatalities and 1.700.000 injuries This is one of the largest socio-economic challenges of our modern society. The ambitious goal of the European Union is to halve the number of fatalities by 2010, thus also contributing towards decreasing the number accidents and injuries. Road fatalities are also a world-wide problem, causing 1,6 million deaths per year, and being the third largest cause of fatalities in the world for certain age groups.	During the recent years, the number of fatalities has shown only a very slight reduction. The effect of the current improvements in vehicle (passive) safety and road infrastructure, plus the enforcement, education and other ongoing measures seems to be largely counter-acted by increasing traffic volumes. Without further measures, the number of fatalities can be expected to remain at the current unacceptable level. Furthermore, the number of accidents is still increasing, adding to the large-socio-economic cost of road transport. Note: Recently adopted Road Safety Action Programme contains measures which will contribute towards this goal. Recent action programmes in some Member States seem also to give positive results. These improvements however depend strictly on the amount of police controls and may not be sustainable	Positive impact on number of accidents, injuries and fatalities. The proposed measures target large reductions in the number of road accidents through integrated systems which involve preventive safety systems which can potentially avoid the accident completely, systems that mitigate its consequences if it still takes place, and summon assistance after the accident. The proposed measures also include (1) certification and validation methodology for these systems, (2) a methodology for assessing their potential impact and choosing the most effective one, and (3) actions for developing Road Maps for their introduction. Introduction of new systems in the vehicles, including intelligent vehicle safety systems, can potentially increase the driver workload and cause distraction. Improving Human-Machine Interaction is therefore also a priority topic in the proposed

			measures.
Impact on the socio-economic costs of road injuries and fatalities, including medical care	The current cost of road accidents, injuries and fatalities is estimated to be 160 Billion € or 2% of EU GDP	Without policy change the costs can be expected to increase at the pace with the cost of medical care. The cost of car repair is also showing increasing trend.	Positive impact through the reduction of the number of accidents, injuries and fatalities. However, the full effect of the introduction of intelligent vehicle safety systems on the socio-economic costs is not known and therefore one proposed measure is to initiate a study on this issue. Cost of the car maintenance and repair could increase due to increasing complexity. For this reason the proposal promotes actions supporting independent repairers.
Impact on consumer awareness and demand	Consumers are not currently well aware of the potential offered by the new technologies for improving road safety. This applies even to systems which have been on the market for quite some time, such as ABS and ESP. The consumers generally place safety very high on the list of desirable features on a vehicle, but may not know what features to demand, or may not be willing to pay for them.	Situation remains mostly the same. Some manufacturers have initiated safety campaigns and are advertising advanced features.	Positive impact, due to increased publicity and user awareness measures which are part of the eSafety Forum activities.
Impact on the creation of pan-European value-added safety and security services	The availability of pan-European value-added safety and security services is crucial for the consumers. Examples of such services are the eCall, and real-time traffic and travel information. Both have direct impact on safety and security	Fragmented services exist, with slow development, poor penetration and coverage. For example, services introduced on the German markets only operate there, and anyone crossing the border has no longer access.	Positive impact. The proposed measures include (1) actions for creating pan-European e-Call service (2) further actions for promoting European Real-Time Traffic and Travel information services.
Impact on risk management and product liability	The legal and liability issues involve new risks to the customers, the society and above all the manufacturers in the	Without further measures, product liability remains one of the main barriers for the introduction of the intelligent	Positive impact. The proposes measures include (1) developing a methodology for risk benefit

	terms of product liability and increased financial risks such as call-back campaigns. The risks also include human factors such as dependability, controllability, comprehensibility, predictability and misuse robustness.	vehicle safety systems on the markets.	assessment (2) achieving an industrial and societal consensus on a European Code of Practice, and (3) establishing guidelines for the market introduction of Intelligent Vehicle Safety Systems.
Impact on employment	Currently close to 2 million people are employed by car manufacturers and equipment supplier in Europe. Further jobs created by this sector are in the telecom and IT industries. Overall, the automotive sector is of crucial importance for Europe.	The employment is expected to remain on the current levels, although there are very rapid fluctuations due to the general market demand, introduction cycles of new models, and shifts in market shares	Regarding automotive manufacturers the situation remains neutral. Positive impact is expected in the case of equipment providers, for the telematics industry and for the service providers.

Table 4: Comparison of policy options

4.2.How large are the additional ('marginal') effects that can be attributed to the policy proposal?

The main objective of the chosen policy proposal (Commission Communication) is to contribute to the goal of halving the road fatalities in Europe by 2010. The supported measures will have also other economic, environmental and societal effects, as shown above.

The marginal effects of the proposed measures cannot be fully quantitatively analysed at this stage, although the effect is known to be positive. A preliminary analysis the economic, environmental and societal effects of three if the measures listed above (RTD, eCall and 24GHz UWB Short-Range Radar is given in Appendix 1. It is believed that these are indicative of the achievable effect which can be achieved by the introduction of Intelligent Vehicle Safety Systems.

4.3.Are there especially severe impacts on a particular social group, economic sector or region?

Impact on the society

The measures introduced in the chosen policy proposal, a Commission Communication can potentially benefit all the 375 million road users in the EU, and all economic sectors which depends on mobility and transport for their activities, livelihood and growth. The age group most affected is the 14-25 years old, for whom road accidents are the primary cause of death.

There are currently large variations in the number of accidents, incidents and fatalities per kilometre travelled, between the Member States of the Union, and also huge scope for improvement in the candidate countries. The reasons often mentioned to explain the differences are level of adherence to the current safety measures (such as speed limits, alcohol limits and safety belt use), discrepancies in applying enforcement and differences in the investment in the physical road infrastructure. The measures introduced in this proposed policy measure have the potential to benefit all Member States, as the proposed new safety systems will most probably be introduced in all markets simultaneously through new vehicle generations.

A specific problem, however, relates to the cost of these systems, and the penetration rate of new technologies which is associated with the renewal rate of the vehicle pool in Europe. This is why the proposed policy measureincludes actions for the estimation of the socio-economic benefits which could be obtained by the introduction of new safety systems in the vehicles. The results of this study can be used to justify financial incentives aimed at lowering the cost of such systems to the consumers, and thus accelerating their deployment to the vehicle classes used by the most vulnerable age groups.

Impact on the industry

The proposed policy measure is expected to have an impact on three main industrial sectors, the automotive, telecom, and IT industries. The potential impact on the automotive industry, which manufactures about 17 million vehicles per year and employs, together with its suppliers, close to 2 million people in Europe, is the most critical one.

The introduction of new features such as active safety systems in the vehicles could be based on market demand or be mandated by regulation. Both these approaches are problematic since the automotive industry is highly competitive and the markets are very sensitive to price variation as, especially within Europe, they are saturated.

- New features could be used as a marketing tool to increase sales and justify price increases, where the customer desires the feature. However, if the customer does not associate any benefit to the feature then it becomes a liability and it may be difficult to justify its fitment. Leaving the take up of such systems to market demands could reduce the rate of penetration into the market place and consequential societal benefit, but would allow for product differentiation.

- Mandating the features on vehicles could significantly increase the cost of vehicles and restrict the further development of new products. In many instances the technologies are not mature and it is not possible yet to demonstrate them or their benefits.

Furthermore, especially where the systems depend upon information being communicated to or from external sources, investment by industry cannot be expected unless the provision of those external sources can be ensured in an appropriate timescale.

For this reason, the policy proposal does not impose any fixed set of technologies or fixed dates, but rather promotes a comprehensive public-private partnership approach. The timetable for the introduction of the new systems, and the particular mechanisms (sufficient demand for a positive business case, a public-private business case, or regulation) with the accompanying set of further measures should be decided later when the technologies and systems mature.

For the telecom and IT industries, the situation is not so critical since the provision of services and systems in the eSafety field represents new market areas and opportunities for increasing sales. These rapidly expanding markets include the supply of components and subsystems, telecommunications and content provision for value-added services.

4.4.Are there impacts outside the Union on the Candidate Countries and/or other countries ("external impacts")?

Candidate Countries and Community of Independent States

Road accidents, injuries and fatalities are a pertinent problem in the candidate countries. Although the number of fatalities showed a decreasing trend for the second consecutive year in 2001 (decrease by 4.9% in 2000, by 4.7% in 2001), the absolute figures remain very high when compared to the population[16]. Although the number of fatalities decreased, the number of injured and the number of accidents both increased significantly. Furthermore, there is a significant variation in the trend between different countries.

[16] Data on Road Safety in Europe in 2000,2001 – Conférence Européenne des Ministres des Transports (CEMT)

Central and Eastern European Countries	Number of deaths	Trends 2001/2000
Croatia	647	- 2 %
Czech Republic	1 334	- 10.2 %
Estonia	199	- 2.5 %
Hungary	1 239	+ 3.3 %
Latvia	517	- 12.1 %
Lithuania	706	+ 10.1 %
Poland	5 534	- 12.1 %
Slovak Republic	625	- 3.5 %
Slovenia	278	- 11.2 %
Total	11 079	- 4.7

Table 5: Road Accidents in Central and Eastern European countries

In contrast, the number of people killed on the roads in the Community of Independent States rose by 5.3% in 2001. The number of accidents and people injured also experienced a similar increase.

CIS Countries	Number of deaths	Trends 2001/2000
Azerbaijan	559	- 6.2 %
Belarus	1 594	0 %
Moldova	419	+ 3.2 %
Russian Federation	30 898	+ 4.4 %
Ukraine	5 900	+ 13.5 %
Total	**39 370**	**+ 5.3 %**

Table 6: Road Accidents in CIS countries

With EU enlargement, the demand for transport services is expected to increase significantly for both goods and passengers. This will translate into significant increases of traffic both in the EU 15 and in the candidate countries, particularly in through-traffic and cross-border traffic. At the same time, improvements in the road infrastructure remain restricted by the budgetary constraints, and the construction of new or improved arteries takes a significant amount of time.

Improving road safety in the Candidate Countries requires bringing them into the general framework of the EU road safety actions, as stipulated in the Road Safety Action Programme, and the use of all possible measures for improving road safety at EU, national and regional level. The measures brought forward by this policy proposal are expected to have a similar

contribution towards this goal for improving road safety in the Candidate Countries, as for the current EU 15.

World-wide

The automotive industry operates globally. For example, the world-wide turnover of ACEA members[17] was 452 billion € in 2002, out of which 271 billion was realised in Europe. In the same year, ACEA members produced 16,9 million vehicles in Europe, which led to exports with a value of 59,8 billion €.

From both industrial and citizen perspectives, it is extremely important to pursue harmonisation of the technical requirements for the new Intelligent Vehicle Safety Systems, including their performance, specifications, use and user interface. For this reason, this Communication promotes, as an important part of the RTD efforts, international co-operation in the development of intelligent integrated safety technologies. This co-operation should cover Human-Machine Interaction, certification and testing methodology and procedures, harmonisation and standardisation, legal issues, impact and socio-economic benefit analysis, and benchmarking/best practice.

4.5. What are the impacts over time?

These cannot be estimated beforehand. However, the policy proposal contains measures for defining Road Maps that will indicate the timetable for the introduction of the new active safety systems in the vehicles, and the corresponding public-sector road maps for investments. The impacts over time could be estimated as part of the Road Map development.

5. HOW TO MONITOR AND EVALUATE THE RESULTS AND IMPACTS OF THE PROPOSAL AFTER IMPLEMENTATION?

5.1. How will the policy be implemented and monitored?

After adoption of the proposed policy measure, Commission Communication directed to the Council and the European Parliament, the measures will be implemented and the progress monitored through the eSafety Forum which will report to the Commission. The two main objectives of the Forum are to promote the development, deployment and use of Intelligent Vehicle Safety Systems, and to monitor the actions of all stakeholders. The eSafety Forum, with its wide membership encompassing all stakeholders, will be best placed to perform this important function. The Commission will seek to support this activity through RTD funding (Specific Support Actions), and may consider the need of presenting a progress report to the Council and the European Parliament in view of keeping focus on the issues and proposing further measures when necessary.

What are the arrangements for any *ex-post* evaluation of the policy?

Due to the continuous monitoring mechanism which will be set up, there is no need for a separate ex-post evaluation. However, in the case of further measures which may be introduced later, the need for ex-post evaluation will be considered on case-by-case basis.

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[17] BMW, DAF, Daimler Chrysler, Fiat, Ford Europe, GM Europe, MAN, Porsche, PSA, Renault, Scania, Volkswagen, Volvo

6. STAKEHOLDER CONSULTATION

6.1. Which interested parties were consulted, when in the process, and for what purpose?

All major road safety stakeholders have been consulted. The consultation process, with an emphasis on industrial issues, consisted of two eSafety High-Level Meetings and an eSafety Working Group of some 40 experts. The Member States were consulted through the High-Level Group on Road Safety, in collaboration with DG TREN. This policy proposal can be seen, to a certain extent, to be the Commission's response to the need for actions established through these consultations.

The eSafety High-Level Meetings and the eSafety Working Group

In April 2002, the Commission organised, together with the automotive industry and other stakeholders, a High-Level Meeting on eSafety.

The HL Meeting had representatives from the following stakeholders: automobile manufacturers, equipment suppliers, motorway operators, telecommunication operators, service providers, insurance industry, road safety and user organisations, road authorities, emergency service providers, Member States and the European Commission.

As a result of this meeting, the partners decided to establish an eSafety Working Group consisting of some 40 experts, and mandated it to propose a strategy for accelerating the research, development, deployment and use of ICT-based intelligent active safety systems for improving road safety in Europe. This Working Group had a limited membership, but nevertheless had participants from all important stakeholders.

The eSafety Working Group concluded its work in November 2002 and published its Final Report, with 28 Recommendations. This Final Report was discussed by the Second eSafety High-Level Group in November 2002, with the following conclusions:

This 2nd High-Level meeting, gathering some 60 representatives from industries, European Commission and other public authorities discussed the Final Report of the *e*Safety Working Group made the following conclusions:

(1) Approved the Final Report as a basis for the next steps in the public-private eSafety initiative

(2) Decided to establish an *e*Safety Forum as a more permanent body for promoting *e*Safety and monitoring progress

(3) Made the *e*-Call the 1st priority in eSafety

(4) Acknowledged the Commission's plans to bring forward a Communication with community actions in 2003

(5) The 2nd High-Level Meeting made also conclusions related to acting together on *e*Safety, role of the Member States, the *e*-Call, Human-Machine Interaction, eSafety user Demand, the *e*Safety Forum and the next steps

The High-Level Group on Road Safety

The High-Level Group on Road Safety, consisting of representatives from the Member States, was given a full briefing on the eSafety initiative in November 2002. Furthermore, the Road Platform Meeting, consisting mainly of Member States road authorities and motorway operators, were briefed of the initiative in March 2003. In both meetings the Member States have welcomed the eSafety Initiative, and expressed the wish for the Commission to come up with further policy measures regarding eSafety (the Commission Communication).

The Council of the European Union

The Transport Council discussed in its 2515th meeting in Luxembourg on 5 June 2003 the Road Safety Action Programme, concluding as follows (§ 13):

The Council of the European Union NOTES that although considerable progress has been made with respect to vehicle safety, such as that achieved under the European New Car Assessment Programme (EuroNCAP) there is still large scope for improvement, in particular as regards high added value safety related technologies, …..and in developing the eSafety Programme.

6.2.What were the results of the consultation?

- The second eSafety High-Level Meeting endorsed the Final Report as the basis for further actions in advancing the use of ICT for improving road safety in Europe and welcomed the Commission's plan to draft a further policy measure (a Communication).

- The Member States welcomed the eSafety Initiative, and expressed the wish for the Commission to come up with further policy measures regarding eSafety (a Commission Communication).

- The Council noted that there is still large scope for improvement, in particular as regards high added value safety related technologies and in developing the eSafety Programme.

7. COMMISSION DRAFT PROPOSAL AND JUSTIFICATION

On the basis of wide-ranging consultation of all road safety stakeholders, a Commission Communication is seen as the best policy option for promoting, as the next step, a set of measures for improving road safety with new technologies. This Communication would be complementary to the Commission Communication on the Road Safety Action Programme, which gives the overall strategy and framework for the Commission's continuing efforts to improve road safety in Europe using measures in its areas of competence, and would offer clear positive effects and impact compared with "no policy change option".

Other policy measures, such as recommendations or regulation, cannot be reliably applied at this stage. The Commission reserves, however, the right to propose further measures later, on the basis of progress in implementing the measures identified in the draft Communication. The principal mechanism and platform for monitoring the progress and proposing further measures will be the eSafety Forum, which brings together all the relevant stakeholders.

Appendix 1

1. IMPACT OF MEASURE 2 – RTD

The positive effects of any Advanced Driver Assistance Systems (ADAS) are generally undisputed. Many statements exist in the literature that underline the potential general benefits of such systems. There will be less accidents leading to a decrease in the number of injuries and fatalities, increased efficiency of the transport network, and so on. Nevertheless, at this stage most of the calculations made rely on simulations and little empirical data is available.

The potential impact of ADAS market introduction in social and economic terms has been analysed by some European projects. The following analysis which is considered to illustrate well the potential benefits is done by the Project CHAUFFEUR 2[18]. This project developed a safety system for trucks called "CHAUFFEUR Assistant". This system is mainly based on a combination of adaptive cruise control (ACC) and a lane keeping system. The assessment is based on a cost-benefit analysis (CBA). CBA is a welfare economic based simulation of the market solution for public decisions. The social desirability is proven by various welfare criteria.

Impact on safety

The Assessment is done considering the data of Germany. The project considers 3 implementation scenarios:

- A= 10% of the fleet equipped with the system

- B= 20% of the fleet equipped with the system

- C= 40% of the fleet equipped with the system

The expected impact of the system in Germany is the following:

- Impact on safety: improvements are achieved by avoiding truck accidents. Due to the functional specification of CHAUFFEUR Assistant (CA) important kinds of heavy truck accidents can be avoided:

– Rear-end collisions due to longitudinal control provided by enhanced ACC,

– Lateral collisions and left-roadway accidents due to lateral control provided by lane keeping system.

Accident data for German motorways (Stat. Bundesamt 2001) show that trucks are involved in about 30% of all accidents with personal injuries and 26% of all heavy property damage accidents. Looking at the accident consequences, nearly 50% of all fatalities on German motorways are connected to accidents which involve trucks. This illustrates that truck accidents are often severe accidents. It is obvious that only accidents that are caused by trucks can be avoided by this system. The risk for accidents which are caused by passenger cars will remain constant. Looking at the target group, 3,587 accidents were caused by heavy trucks of

[18] CHAUFFEUR II is a project supported by the IST Programme (FP5), IST-1999-10448

more than 16 t maximum weight, and semi-trailers. 2,360 of them were personal injury accidents whereas 1,227 were serious property damage accidents.

Scenario	Avoidable accidents with personal injuries	Avoidable accident with Heavy property damage	Total
A	135	71	206
B	271	142	413
C	542	284	826

Impact on capacity

The main impact of the CHAUFFEUR II system comes from the better usage of road infrastructure capacity. The physical effects on the capacity of motorways were calculated through traffic simulation. This effect leads directly to savings of time, costs, vehicle operating costs, and emission costs. The level of this capacity effect depends on the number of lanes, and the percentage of trucks equipped with the CHAUFFEUR II system.

Scenario	Capacity effects on motorway (increase in capacity)
A	+0.63%
B	+1.33%
C	+2.67%

Lee driving effects

The calculation of lee driving benefits requires vehicle stock data at first. 284,665 heavy trucks and semi-trailers are used by German transport suppliers. 62.8% of the vehicle stock consists of heavy truck with more than 16 t permissible weight. The share of semi-trailers is 37.2%. The total vehicle-km of trucks on German motorways amount to 23.33 billion km per year. Therefore, with CA equipment of 10% on motorways (scenario A) the vehicle-km of the CA equipped trucks come up to 2.33 billion km. With 20% and 40% equipment the vehicle-km amount to 4.67 and 9.33 billion km, respectively. In order to calculate the obtainable fuel savings it has to be kept in mind that the enhanced ACC function can not be used permanently because not all driving situations are suitable for ACC (for instance when no predecessor is in sight). ACC can be used in 70% of the driving situations.

Reduction effects	**A**	**B**	**C**
Fuel consumption (1000 lit.)	26.79	53.57	107.15
NOx equivalent in tonnes	1.243	2.487	4.973
CO_2 emissions in tonnes	101.256	202.512	405.025

Cost Benefits Analysis

The benefit-cost ratios range between 3.67 (scenario A) and 4.94 (scenario B). Hence, introducing CHAUFFEUR Assistant is very positive for the society. An investment of 1 Euro leads to a social return of more than 4 Euro. Because of its operational flexibility the CHAUFFEUR Assistant generates its benefits even in the beginning of market penetration with low equipment rates. It is obvious that with 10% equipment rate the capacity effect is very low but other effects like lee driving offer significant cost savings from the very introduction. The dynamic effect of market penetration (trucks with high vehicle-km will be equipped first) reveals its impact in scenario C. Although benefits have more than doubled compared to 20% equipment rate the system costs are rising to more than double. This is due to the effect that market penetration grows faster than the attainable CHAUFFEUR Assistant equipment on motorways. To put it in other words, with progressive market penetration trucks with lower annual vehicle-km will also be equipped.

Scenario A	Valued effects in M€		
Benefits	Capacity effects	16.16	61.60
	Lee driving	29.96	
	Safety enhancement	16.74	
	Congestion reduction	1.74	
Costs	Investment costs	15.54	16.79
	Operating and maintenance costs	1.25	
Benefit/cost ratio			3.67

Scenario B	Valued effects in M€		
Benefits	Capacity effects	73.96	164.96
	Lee driving	53.91	
	Safety enhancement	33.61	
	Congestion reduction	3.48	
Costs	Investment costs	31.08	33.58
	Operating and maintenance costs	2.51	
Benefit/cost ratio			4.91

Scenario C	Valued effects in M€		
Benefits	Capacity effects	175.81	357.79
	Lee driving	107.82	
	Safety enhancement	67.20	
	Congestion reduction	6.96	
Costs	Investment costs	69.93	75.56
	Operating and maintenance costs	5.64	
Benefit/cost ratio			4.74

2. IMPACT OF MEASURE 4 – ECALL

In-vehicle Emergency Call (e-Call) with accurate vehicle location and additional safety-related information can dramatically reduce emergency response times, saving lives and reducing the consequences of serious injuries. E-Call also has the potential to reduce congestion and secondary accidents, and to allow the correct response in case of accidents involving hazardous goods.

For e-Call, the Commission is proposing an integrated strategy for a Pan-European service, building on the provision of the so-called E-112 legislation, which is contained in the new electronic communications directive[19]. The benefits of location-enhanced emergency services have been estimated by the CGALIES[20] group, based on a study prepared by Helios Technology Limited on behalf of the DG INFSO under contract reference 2001/48559. Furthermore, the realisation of a pan-European in-vehicle emergency service is being studied by project EMERGE[21], aiming to ensure availability of vehicle-based emergency call systems from any vehicle anywhere in Europe.

The Problem

Each year in the European Union several million citizens dial an emergency number. These calls originate to an increasing degree (in some countries, close to 70%) from mobile phones. A large number of emergency calls concern road accidents, reported by persons involved, others (so called Good Samaritans), or in a relatively small percentage of cases, automatically by in-vehicle e-Call systems.

Overall, there are approximately 80 million "real" emergency calls, out of which approximately 40 million calls emanate from mobile phones. For these 40 million calls handled by Public Service Answering Points (PSAPs), considerable time is lost in approximately 3,5 million of the calls due to missing or inaccurate call location information. Furthermore, the emergency services are not able to dispatch a rescue team for approximately 2,5 million calls, due to absence of the location information.

The studies both in Europe and U.S. (where legislation on location information on 911-calls, so called E-911 mandate is in force) indicate that the more accurate location information, and the additional parameters (vehicle direction, speed, number of occupants, release of airbags etc) will significantly increase the speed and quality of the response by the Emergency Authorities to the incident, producing further benefits. This is especially true for the problem of "Good Samaritan" calls.

Typically, the same incident is reported by multiple callers (average 40 per incident). In most cases it is very difficult to distinguish between the "real" emergency call, and the multiple Samaritan calls. Furthermore, today's experience shows that "Samaritan" callers in more than half of the cases cannot give an exact location reference for the incident to report on, since they did not stop at the scene of the incident but simply drove on and made the report later on. Accurate location and additional information will make sorting out these calls much faster and reliable.

The context

With the adoption of the new regulatory package, the forwarding of caller location by operators will be obligatory. Article 26 from the Directive on universal service and users' rights relating to electronic communications networks and services (2002/22/EC of 7 March 2002) states that:

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19 Directive 2002/21/EC of the European Parliament and of the Council of 7 March 2002 on a common regulatory framework for electronic communications networks and services (Framework Directive), Directives 2002/22/EC and 2002/58/EC

20 See the Final Report of CGALIES (Co-ordination Group for Access to Location Information by Emergency Services), http://www.telematica.de/cgalies/

21 Pan-European harmonisation of Vehicle Emergency call Service Chain EMERGE, IST-2001-34061

– Member States shall ensure that undertakings which operate public telephone networks make caller location information available to authorities handling emergencies, to the extent technically feasible, for all calls to the single European emergency call number 112.

This provision establishes a legal requirement on operators, both fixed and mobile, for delivering location enhanced 112 (or 'E-112') to Emergency Authorities across Europe. It will enter into force in the Member States by 24 July 2003.

To complement the new legislation, the Commission services consider that it is important to outline a roadmap for implementation of E-112 services. Taking into account other work and discussions in the CGALIES group and further consultations, a Recommendation on the implementation of E-112[22] has been recently adopted. This Recommendation has also provisions for the in-vehicle e-Calls.

Benefits to society

E-112's and e-Call's primary objective is to enhance all 112 emergency calls made throughout Europe with location information, and in the case of in-vehicle calls, additional safety-related information. This information will be provided to the relevant Public Service Access Points [PSAPs] and Emergency Authority (EA), enabling a timelier response, more effective and improved quality of service. This in turn delivers substantial benefits to society in terms of saving lives and a sense of security.

The primary benefit to society is straightforward; that of saving lives and an increased sense of security. These societal benefits can be substantial. For instance, a German study estimates considerable savings by an improved emergency service and speedier rehabilitation[23]. Furthermore, various incident management studies have proved that rapid and adequate response to an incident is the most effective way to reduce traffic congestion and delays.

Benefits for mobile and automotive users

The most obvious, and extremely relevant benefit to the mobile and automotive users is related to co called "golden hour". In the case of traffic accidents 20 – 40% of seriously injured victims require medical attention within the first 2 hours to survive. In this period the accident must be reported, located, and responded to.

A variety of tests have been conducted in the USA to improve the response time. These trials showed clearly the benefit of automatic location information to enhance survivability after suffering a traffic accident, and demonstrated that in-vehicle e-Call has the potential to significantly increase the number of accident victims which can be attended to during this "golden hour".

With e-Call, all mobile users also benefit from an increased sense of security. This is particularly relevant for European citizens travelling abroad who may not necessarily be familiar with a local language or local emergency service arrangements.

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22 Commission Recommendation on the processing of caller location information in electronic communication networks for the purpose of location-enhanced emergency call services, 2003

23 Automatisches Notrufsystem, Positionspapier des Zentralverbandes Elektrotechnik- und Elektrotechnikindustrie

The secondary benefits may be varied and include:

- Increased confidence in emergency service provision: A faster arrival at the scene of the incident will increase the confidence that the citizens have in the emergency services.

- Reduced stress: The caller will feel less distressed and more secure if they are aware that the emergency services can locate them faster.

- Decreased reliance on verbal communication: Since the EA will already know the location of the caller, the fact that they may be unable to communicate may not be as critical. This situation may arise for callers with disabilities such as hearing or speech disabilities, for callers under stress, or for callers who do not speak the appropriate language.

Benefits for the Public Service Answering Points (PSAPs)

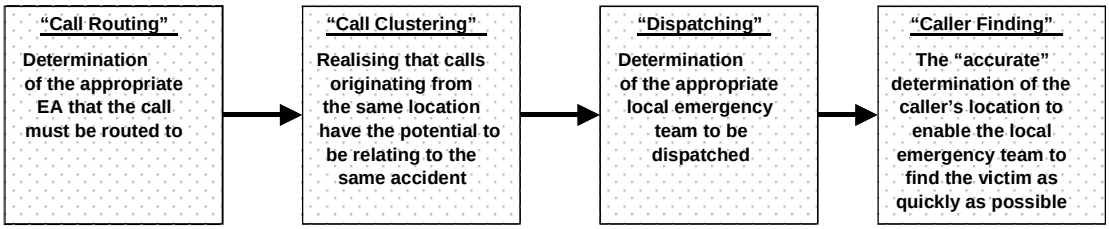
In general terms, there are four operational stages to the handling of an emergency call. The provision of location information will potentially assist, as follows:

– Call routing: Location information could be used to assist in routing the calls to the appropriate PSAPs faster and minimise misrouting of calls. Member States have stated that an acceptable level of misrouted calls is 5%.

– Call clustering: The number of 'Good Samaritan' calls has the potential to increase with wide availability of mobile phones, and hence calls can become more clustered. The degree to which this is a problem varies greatly between EAs. The provision of location information will help to identify potential call clusters due to the same incident and this may, in turn, result in improved call handling policies.

– Dispatching: Location information can assist the dispatch process by ensuring that the most appropriate (e.g. nearest) service is sent to the incident.

– Caller finding: For nearly 10% of mobile emergency calls the caller cannot give their location, or this information is insufficient or is later found to be inaccurate. The provision of location information can obviously assist in finding the caller in these situations and when insufficient location data is given verbally.



These operational stages form the basis from which benefits are delivered to society, EA operations and mobile and automotive users. In addition to these major benefits, E-112 is also expected (as a consequence) to benefit industry.

Benefits to Emergency Authority Operations

The primary benefit to the EA operations is to provide a more timely and more effective response to the citizen who is in an emergency situation. Accurate automatic location

referencing is the best way to know where emergency vehicles should be sent. Accurate automatic location referencing is the foremost way to find out if there are multiple accidents. Secondary benefits may include:

- More efficient use of resources: With additional information on location, resources closest to the incident can be dispatched. This could in turn reduce the cost of operations if efficiency is improved. Therefore an up-front investment could serve to save costs in the longer term.

- Reduced stress and trauma amongst personnel: If officers are able to reach the incidents faster then this may lead to reduced stress and reduced work overload.

3. IMPACT OF MEASURE 6- 24 GHZ UWB SHORT-RANGE RADAR

Radar sensors allow obstacle detection in certain driving situations. Detecting cars and pedestrians could contribute to accident prevention. Once the vehicle's electronic systems are aware of the traffic environment around the car, effective measures to prevent certain types of accidents could be taken, and in the case when a crash is inevitable, the passive safety systems in the vehicle could be optimised.

Ultra wide band (UWB) 24 GHz short-range radar is considered to be a key technology for an interim solution for the next 10 years for a wide range of safety systems, as. Nevertheless, there remain regulatory barriers relating to radio spectrum frequency allocation that will affect timely achievement of Community goals if not solved co-operatively. This bandwidth has been approved for automotive use in the U.S., but not in Europe.

The technology

At present, only one radar frequency can be used for automotive applications: 77 GHz . The 77 GHz radar technology is currently being used for long-range applications like adaptive cruise control (ACC).

For distance and speed measurement, and for object detection all around the vehicle an attractive technical alternative is to use radar sensors at 24 GHz. These sensors can be distributed all around the vehicle. The most important reason for choosing 24 GHz (instead of, for example, 77 GHz) is that the properties of the 24 GHz bands meet the technical requirements and enables the use of small antenna and radar modules which can be mounted in or behind plastic panels, such as the bumpers of a car, as well as the availability of off-the-shelf mature and mass produced components.

Items	24 GHz	77 GHz
Cost short-range sensor for OEM	Fair (about 40 €)	Not acceptable (about 1600 €)
Availability of RF components	Fair	Poor
Mass production technology	Mainly standard	Not available
Mounting behind plastic panels	OK	Not possible

Typically, up to 12 sensors can be fitted in a car. The potential applications include frontal collision warning and avoidance, ACC with stop and go, side-crash, rear-crash and blind-spot warning, parking aids, lane change support and pedestrian protection.

The benefits

The German Federal Statistic Office estimates that 55,740 accidents, or 15% of the total, involved insufficient distance between vehicles. In a study done by Volkswagen, an analysis of the pre-crash braking behavior shows that in severe accidents about 85% of drivers either did not brake at all or not to the full possible deceleration. Furthermore, 15% of the total number of people killed on European roads are pedestrians, and 28% are vulnerable road users[24].

A study in the U.S. by NTHSA indicated that the main causes of rear-end crashes are driver inattention (68%), inattention and following too closely (11%), and following too closely (9%). It has been estimated that 24 GHz automotive radar could address 88% of all causes of rear-end crashes, and 37% to 74% of rear-end crashes are theoretically preventable by the use of headway detection systems[25]. An investigation by Daimler-Benz indicates that providing a driver with an additional 1-second warning to react can reduce rear-end collisions by nearly 90%.

The other benefits of the same technology include:

- Sensing of the vehicle's surroundings could provide the driver with a "virtual eye", helping to avoid parking lot collisions and crashes with pedestrians and other vulnerable road users. Parking lot collisions alone represent one third of the accidents causing material damage to the cars, and are therefore of huge economic importance.

- Moreover, reducing accidents is expected to reduce corresponding traffic congestion and thereby reduce transport-related emissions and protect the environment. This applies both to motorways and highways, where accidents and pile-ups can be avoided, and to dense city traffic

[24] See the CARE database, http://europa.eu.int/comm/transport/home/care/index_en.htm

[25] Assessment of IHVS Countermeasures for Collision Avoidance: Rear-end crashes, U.S. Department of Transportation