

Measure 55: Intelligent transport systems and e-Safety

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<p><i>Policy package:</i></p> <p>ID: Road Safety, quality and environment</p>
<p><i>Measure 55:</i></p> <p>Intelligent transport systems in the eEurope Plan</p>
<p><i>What is the problem being addressed ?</i></p> <p>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 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 2 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.</p> <p>One of the possible measures to tackle the road safety problem is therefore to accelerate the development and deployment of advanced, active in-vehicle and co-operative safety systems based on Information and Communication Technologies (ICT). 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. Indeed, 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 certainly contributed, amongst other measures, to reducing by 50% the number of deaths in EU15 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, 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.</p> <p>In this context, Intelligent Vehicle Safety Systems which use Information and Communication 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.</p>
<p><i>Measure's costs and/or benefits:</i></p> <p>Assessing even tentatively future cost of ITS presents considerable difficulties. In fact ITS ranges from navigators, sensors, communicators, supports to driver's needs provided by on board equipment and/or terminals -- to area systems aimed at traffic control, monitoring and real time communication with users. Part of these costs go under the heading of general social services and supports. Part of them are individualised and will be borne by each user. The cost of intelligent vehicle safety systems can be prohibitive, and this means that the safety benefits can only be realised with sufficient penetration on the markets which allow to reduce the prices. For example, the price of a collision mitigation or adaptive cruise control system is around 2000 €.</p>
<p><i>Legislative implementation at the EU level:</i></p> <p>COM (2003) 542(01) Communication from the Commission to the Council and the European Parliament "Information and Communications Technologies for Safe and Intelligent Vehicles"</p>
<p><i>What are the objectives ?</i></p> <p>The White Paper recognises that, although the responsibility for taking measure the halve the number of deaths</p>

due to road accidents by 2010 will principally fall to the national and local authorities, the EU needs to contribute to this objective through a number of its own actions, including the promotion of new technologies to improve road safety. 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 safety Working Group¹. The Working Group concluded that the European Commission has to act, especially in relation to its competences 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.

In this context, the policy option undertaken by the European Commission is represented by the Commission Communication mentioned above. This proposes a set of measures as follows:

- Support to the eSafety Forum, to facilitate co-operation of all stakeholders.
- Inclusion of eSafety goals and priorities for further RTD under the 6th Framework Programme.
- Actions required on Human Machine Interaction
- Promotion of an harmonised, pan-European in-vehicle emergency call (e-Call) service that build on the location-enhanced emergency call E-112.
- Monitoring of the progress made in the provision of Real-Time Traffic and Travel Information (RTTI) in Europe.
- Removal of legal barriers to the use of 24 GHz UWB short-range radar.
- Review of the relevant parts of the existing EC vehicle type-approval legislation.
- Promoting the needed standardisation in ISO, CEN and ETSI.
- Assessment of the socio-economic benefits.

It is important to note that 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 and, especially within Europe, they are saturated. 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 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.

Interactions with other WP measures:

The 3rd Road Safety Action Programme (Measure 47) and the e-Safety actions (Measure 55) are largely complementary, both aiming to the ambitious objective of halving the number of road fatalities by 2010.

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Output indicators:

There is no doubt that current progress in ICT will find many application in transportation from stand alone hardware to wide area systems. Breakthroughs are so frequent and important that it will be very hard to produce even medium term forecasts. It will be appropriate to monitor the situation and react by frequent revisions of any projection. After adoption of the proposed policy measure, the single measures included in the Commission's Communication 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.

Outcome indicators: intermediate impacts on transport markets

The key market impacts of the proposed measure are illustrated below:

- Impact on competitiveness of equipment suppliers and telecom and IT industries: the amount of electronic

¹ The Final Report of the safety Working Group on Road Safety, November 2002, see http://europa.eu.int/information_society/programmes/esafety/index_en.htm

sensors, components and subsystems is already considerable, and this is a growing market. As the car parc of vehicles with telematic 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 subsystems and the comfort systems, such as Multi-media and navigation systems. Thus, the telecom and IT industries and the equipment suppliers benefit from the measures mentioned above (see first page), 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 significant market penetration levels. Obtaining these can take a very long time, as is shown by the introduction of ABS. 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. The eSafety actions which will contribute mostly to foster market penetration and more affordable prices are (1) support to standardisation leading to wider harmonised markets and lowering costs, (2) contributing to a joint public-private business case e.g. with incentives and (3) increasing user awareness, leading to an increase in market demand.

Outcome indicators: final impacts on transport users and non users

The most important expected impact of Measure 55 is obviously on the number of road fatalities, that should be reduced significantly. There are currently large variations in the number of accidents, incidents and fatalities per kilometre travelled, between the EU Member States. The reason often mentioned to explain the differences are level of adherence to the current safety measures (such as speed limits, alcohol limits and safety belts use), discrepancies in applying enforcement and differences in the investment in the physical road infrastructure. The actions introduced with Measure 55 have the potential to benefit to all Member States, as the proposed new safety systems will most probably be introduced in all market simultaneously through new vehicle generations. A specific problem, however, relates to the cost of these systems and, as mentioned above, the penetration rate of new technologies which is associated with the renewal rate of the vehicle pool in Europe.

More in general, the proposed actions 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. However, introduction of new systems in the vehicles can potentially increase the driver workload and cause distraction: improving Human-Machine Interaction is therefore also a priority topic in the proposed actions.

Finally, an ancillary impact is expected on traffic congestion and efficiency of traffic network, and this will cause benefits to all road transport users in terms of reduced travel times and increased reliability of road journeys. Indeed, 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 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. However, it is important to note that increased safety and efficiency of road transport will tend to make choice of road mode more attractive, hence counteracting the desired shift from road to rail.