Contemporary society heavily depends on mobility, but transport entails severe problems, such as congestion at road networks and in urban areas, harmful effects on the environment and public health, waste of energy and, above all, accidents which cause fatalities, injuries and material damages. Location information, together with the mobile communications, enables a large number of telematics services like innovation-enhanced emergency call (eCall), in-vehicle navigation, Points of Interest (POI) services, vehicle tracking etc. The paper is analysing the European Union legislation on eSafety communication i.e. providing real-time information on road safety, eCall system, communication technologies for safe and intelligent vehicles. It is targeting the fact that early detection of traffic conditions and transmission of relevant data drivers make significant contribution to improving road safety. In author’s opinion, a comprehensive approach on eSafety is meeting societal challenges and will enable harmonised solution to be found in removing the obstacles to market deployment, encouraging product demand and consensus building among the stakeholders.

**Keywords**: eSafety communication, eCall system, road transport, legislation, legal commitments

**INTRODUCTION**

Modern society depends on mobility and the demand for transport services has grown steadily. Intelligent Transport system (ITS) adds Information and Communications Technology (ICT) to transport infrastructure and vehicles with the target to improve safety and reduce congestions, transportation times and fuel consumption. The development of the more powerful processors, communication technologies, sensors and actuators as important set of tools enables the acceleration in development and large-scale deployment and use of eSafety communication in road transport.

1. **EUROPEAN SOURCES OF LAW ON e-SAFETY COMMUNICATION**

1.1 Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of Regions, Towards Europe-wide Safe, Cleaner and Efficient Mobility: The First Intelligent Car Report

The aim of the eCall system, or in-vehicle emergency call, is to have an automatically call to the emergency services and provide them with the exact location of the vehicle and other information about the accident and vehicle occupants. The required accuracy of the location information and the needed coverage implies the use of Global Navigation Satellite Service (GNSS), using global positioning networks offering accuracy and availability.

The objective of Intelligent Transport System (ITS) is to integrate vehicles and infrastructures providing advanced communication services.
1.2 Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of Regions, The 2nd eSafety Communication Bringing eCall to Citizens

A crucial recommendation of the first eSafety Communication was the establishment of harmonised, pan-European in-vehicle emergency call (eCall) service that builds on the single European emergency number 112. The Directive 2002/22/EC of the European Parliament and of the Council of 7 March 2002 on universal service and users’ rights relating to electronic communications network and services (Universal Service Directive) stipulates the obligation that the public network operators make the caller location of all calls to the extent technically feasible to emergency services.

The 112 calls with location information are known as E112 calls. The eCall device in the car will transmit an emergency call that automatically goes to the nearest emergency service. eCall can be activated manually, but in the case of severe accident the car will send it automatically and the emergency services are notified immediately. The in-vehicle eCall device will establish and emergency call carrying both voice and data directly to the nearest emergency service called Public Safety Answering Point (PSAP).

The reduction of response time is of utmost importance and the cost-benefits estimation indicates significant number of lives that can be saved, with the reduction in the severity of injuries.

1.3 Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of Regions, On the Intelligent Car Initiative: Raising awareness of ICT for Smarter, Safer and Cleaner Vehicles

The present situation is that most of intelligent systems in cars are not yet on the market and that vehicles fitted with telematics are mainly luxury cars representing a small percentage of the market. The primary reasons are high costs and the consequent lack of consumer demand and the lack of information about potential benefits.

The action proposed is to support and co-ordinate the work of the Member States of the European Union and other relevant stakeholders in the Intelligent Car Initiative. The focus is in research and development in the area of smarter, cleaner and safer vehicles as ICT meeting societal challenges. Moreover, the awareness support is crucial for the establishment of eSafety Communication Platform with the goal to improve, coordinate and harmonise the end-user communication of different stakeholders.

1.4 Communication from the Commission, European Road Safety Action Programme, Halving the number of road accident victims in the European Union by 2010: A shared responsibility

More accurate and more efficient systems are available in navigation and guidance system based on digital mapping enhanced by safety information. Traffic information and accident alert system for automatic transmission of essential information to the nearest emergency unit are playing important role in eSafety programme aimed at the deployment of new on-board technologies.

The new on-board information and communication technologies involve, on the one hand, autonomous safety systems capable of incorporating not only vehicle-related and driver-related parameters but also data related parameters and, on the other hand, interactive systems allowing vehicle-to-vehicle exchange of safety information.

1.5 Communication from the Commission to the and European Parliament, Information and Communications Technologies for the Safe and Intelligent Vehicles

The Communication is pointing out the role of safety stakeholders i.e. the European Commission, automotive and telecommunications industry and operators, equipment and service suppliers, motorways operators, road authorities, insurance companies, road safety and user organisations and others. An Emergency Call (eCall) can be intended automatically, and accurate vehicle location and additional safety-related information can be passed to the Public Answering Point (PSAP).
The mentioned information cuts down the emergency response times, saving lives and reducing the consequences of serious injuries. It requires defining the interfaces between the vehicles and the telecommunications network, and between the telecommunications network and the PSAPs, and solving the related liability and responsibility issues.

The legal and liability issues of eCall and real-time traffic and travel information (RTTI) includes new risk to the consumers, the society and above all the manufacturers in terms of product liability and increased financial risks. The risk covers not only technological product liability, but also covers human factor such as dependability, controllability, comprehensibility, predictability and misuse robustness.

The data on societal benefits and cost/benefit ratio are important to implement information and communications technologies for safe and intelligent vehicles. Namely, the automotive industry undertakes market introduction based on their own assessment of technological readiness for market situation and the competition and the availability of supporting infrastructure and incentives. From the public sector point of view it is important to have a strategic planning in incentives and removing regulatory barriers.

2. GLOBAL NAVIGATION SATELLITE SYSTEM PERFORMANCES

The use of signals received from existing Global Navigation Satellite System (GNSS), the best known of which are Global Positioning System (GPS) of the United States of America and the Global Navigation Satellite System (GLONASS) of the Russian federation, has become a cross-cutting tool to support growth in precise positioning applications. With Europe’s Galileo satellite navigation system and China’s Compass/BeiDou navigation system currently being developed and deployed, the number of satellites available at any given time is greatly increased, thereby enhancing the quality of services and increasing the number of potential users and applications.

There are two transmission methods for augmentation services: satellite-based augmentation systems transmit services via communication satellites, and ground-based augmentation system transmits services using terrestrial communication such as radio, mobile networks or the Internet.

A number of space-based augmentation systems and regional navigation satellite systems will add more satellites and signals to multiple systems of satellites and, as a result, improve positioning performance in terms of accuracy, availability and integrity. To benefit these achievements, countries need to stay abreast of the latest development in GNSS-related areas and build the capacity to use the GNSS signal.

3. APPLICATIONS ON e-SAFETY COMMUNICATION

Looking onwards, Information and Communication Technologies (ICT) should guarantee mobility and secure economic growth. Location information, together with mobile communication, enables a large number of telematics services like location-enhanced emergency call (eCall), in-vehicle navigation, Points of Interest (POI) services and vehicle tracking. Existing in-vehicle systems are based on satellite navigation or global positioning system (GPS) due to the necessity to operate also in rural areas where alternative location technology based on mobile communication network does not offer adequate performance.

Location-enhanced emergency call or e-Call has its main benefit to society in saving lives and in offering an increased sense of security. This is achieved by improved call routing obtaining faster and improved information to locate the caller. Also the benefit is in improved confidence in emergency service provision, decreased reliance on verbal communication and reduced congestion.

Competitiveness of the automotive sector depends on its ability to use and adopt the latest information and communication technologies and implement improved legal commitments on road safety. The challenge is in further integrating the automotive market with industrial sector of mobile communication and the industrial sector of information technology.
CONCLUSIONS

Article 71 of the European Community Treaty allows the European Union to adopt measures to improve transport safety, within the limitation of subsidiarity. The improvement of emergency services comes with the cost, but estimated benefit-cost ratio is good. The Member States are invited together at the European level to play a proactive approach with the industry and other stakeholders in road transport.

In author’s opinion, it is important to demonstrate the benefits and opportunities with regard maximizing the use of multiple GNSS, to communicate with providers about compatibility and interoperability requirements, to present the users with the equipment and ground augmentation infrastructure.

Besides implementing improved legal commitments on road safety, the automotive sector competitiveness depends on its ability to use and adopt the latest information and communication technologies. Over the past decade, the number of applications that utilize GNSS has grown tremendously. Further evaluation is needed about perspective and critical issues regarding the increased number of applications for satellite navigation.

It has to be noted that the focus of satellite navigation system is to provide global accurate and reliable positioning, navigation and timing services. The objective is to strengthen regional information and data exchange networks with regard the use of GNSS technology, including capacity-building needs. The aim is to increase awareness among decision makers and policymakers of the benefits of satellite navigation technology and establish broad framework for regional and international cooperation.

The author is urging for enabling of harmonised solution through appropriate legal commitments to be found in removing the obstacles to market deployment, encouraging product demand and consensus building among the stakeholders. Moreover, the author is emphasising the strategic importance of information and communications technologies in a comprehensive approach on eSafety which allows solving of road related societal problems.

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