

# ITS Radar International

## ITS in Europe – Identifying Opportunities for the HA eCall Fact Sheet

### ■ SUMMARY

eCall is an in-vehicle emergency call service that is designed to speed up emergency response, with benefits for both casualties and other road users. The European Commission has set out an action plan that will see all newly type-approved vehicles in Europe equipped for eCall from 2010. This Fact Sheet outlines the service and its potential benefits, summarises the European policy and activities, including research and standards and outlines the UK position.

The Highways Agency is carrying out an investigation into the implications of eCall for the HA through its research programme; the project started in January 2007 and is being conducted by TRL, supported by IBI Group and Halcrow Group.

### ■ KEY WORDS

Emergency response; Location; Traffic management; Safety.

### ■ DATE OF PREPARATION

March 2006, updated January 2007 and February 2009.

The authors of this Fact Sheet are employed by TRL Limited. This work was carried out under a contract placed on 11 March 2008 by the Highways Agency. Any views expressed are not necessarily those of the Agency.

### ■ WHAT IS eCALL?



eCall is an emergency call which can either be made manually by vehicle occupants or automatically when in-vehicle sensors are activated in the event of an accident. The system uses the location-enhanced single European Emergency Number (E-112). The in-vehicle eCall system establishes a 112 voice-connection directly with the relevant PSAP (Public Service Answering Point). Depending on how the service is set up, this may be a public authority or a private eCall centre operating under the regulation and/or authorisation of a public body. At the same time, a minimum set of data (MSD) is sent to the PSAP operator receiving the voice call. The MSD includes key information about the accident such as time, location (GNSS based) direction of travel and vehicle description and may also contain the link to a potential Service Provider through its IP address and phone number. If the user subscribes to a Service Provider, additional information can be sent from the Service Provider to the PSAP. Some vehicle manufacturers offer a private eCall service in some of their vehicle models and in 2008, Bjorn Steiger Stiftung, a road safety foundation, began to provide eCall as part of its 'LifeService' on a not-for-profit basis in Germany; this is being rolled out to other countries in Europe.

## ■ BENEFITS OF eCALL

The number of emergency calls made from mobile phones is growing, but callers do not always know precisely where they are. European Commission figures show that around 50 - 60% of emergency calls are made from mobile phones, and in around 15% of cases it is not possible to identify the location of the caller. In the more serious accidents, casualties may not be able to make an emergency call. The E112 number is designed to provide details of the location of emergency situations automatically, whether the call is made manually or automatically by equipment in the vehicle.

According to research funded by the European Commission in the E-MERGE project, a system which provides the emergency services with accurate details of the location of incidents will enable response times to be cut by about 50% in rural areas and 40% in urban areas. Faster emergency service response increases casualties' chances of survival, reduces the severity of injuries, cuts down the number of secondary accidents and reduces the length of time when traffic is disrupted.

Research in the E-MERGE and SEiSS projects, based on trials at test sites in several countries and analysis of the CARE accident database, indicates that up to 2,500 lives could be saved each year in the EU-25 (around 5% of all road accident deaths in the EU-25), while up to 10% of injuries classified as 'severe' could be reduced to slight injuries. Reductions in congestion resulting from improved response times have been estimated at up to 20%. Annual savings in accidents and congestion have been estimated at €26 billion across the EU-25, set against an estimated annual cost of in-vehicle systems and upgrading PSAPs of up to €4,550 million (almost all of this cost is for the in-vehicle systems). Similar results on the safety impacts were obtained in an in-depth study of road accidents in Finland which concluded that reducing delays in reaching the accident scene could prevent 5-10% of fatalities involving vehicle occupants; these represent 4-8% of all road accident fatalities.

## ■ EUROPEAN POLICY OBJECTIVES

The European Commission sees eCall as a high priority, contributing to the goal to reduce the number of road accident fatalities. Under the eSafety Forum, the European Commission set up an open Working Group (known as the eCall Driving Group) with members from governments, road operators and industry, to take forward the development of eCall. Within this, sub-groups were established covering actions related to the in-vehicle system, standardising transmission of voice and data between the in-vehicle system and PSAP, PSAP requirements, the insurance industry's involvement in eCall and the eCall business case for the various types of stakeholder.

## ■ EUROPEAN ACTIVITIES

### **Memorandum of Understanding (MoU)**

The European Commission published the 'Memorandum of Understanding for Realisation of Interoperable In-Vehicle eCall' (MoU) in August 2004. Since then, the Commission has been working with Member States, telecoms operators, vehicle manufacturers, service providers and other stakeholders encouraging them to sign up to the MoU, which commits them to working towards eCall deployment. The 14 countries within the EU which have signed are: Austria, Cyprus, the Czech Republic, Finland, Germany, Greece, Italy, Lithuania, Portugal, Slovakia, Slovenia, Spain, Sweden and The Netherlands. Outside the EU, Iceland, Norway and Switzerland have signed. More than 60 other organisations including a full range of types of stakeholder have also signed the MoU.

## **Communications on eCall**

In September 2005 the European Commission issued a Communication on eCall: 'Bringing eCall to the Citizens'. This urged governments to act and to invest in the necessary emergency services to support eCall, with the view to a pan-European launch in 2009. Governments were also encouraged to promote eCall at national and international level. In addition, the Commission is promoting the use of 112 and is urging Member States to improve their responses to 112 emergency calls.

The actions for Member States are:

- Sign the eCall MoU, thereby helping to encourage commitment from industry
- Promote 112 and E112 (the single European emergency number and the location-enhanced version), which are currently used in parallel with national numbers in most Member States
- Upgrade PSAPs to handle location-enhanced E112 calls and eCalls
- Provide adequate location-enhanced emergency services and language support.

In April 2006, and in response to this Communication, the European Parliament adopted a resolution on eCall which supported the implementation of pan-European eCall and the Commission's actions, and called for all stakeholders to pursue the actions needed for roll-out of eCall.

In November 2006, the European Commission issued another Communication: 'Bringing eCall back on track – Action Plan (3<sup>rd</sup> eSafety Communication)'. This recognises that with the long lead times in product development and slow progress in eCall infrastructure implementation in Member States, the original target date for eCall implementation would not be realised. It sets out a new Action Plan for achieving eCall as a standard option in all vehicles in Europe receiving type approval from 1<sup>st</sup> September 2010. The Communication lists actions for Member States and industry aimed at eCall deployment by 2010. The actions for Member States are similar to those listed in the second Communication but with some more specific actions:

- rolling out PSAP infrastructure by mid-2009
- carrying out field tests
- supporting the EC Expert Group on Emergency Access
- supporting the EC Working Party on Data Protection and Privacy Issues.

Among the European Commission's actions to facilitate eCall deployment are: support through the 7<sup>th</sup> Framework Programme for large scale field operational tests of eCall to assess the impacts and user acceptance of the service and support for industry in developing a positive business case for eCall.

In December 2008 the European Commission's Communication: 'Action Plan for the Deployment of Intelligent Transport Systems in Europe' emphasised the contribution of a range of different types of driver assistance systems, including eCall, to reducing road deaths. One of the proposed actions for the Commission was to support the Implementation Platform for harmonised introduction of eCall, including awareness campaigns, upgrading PSAP infrastructure and assessing the need for regulation.

## **eCall Implementation Platform**

The Implementation Platform mentioned in the ITS Action Plan is open to signatories of the eCall MoU and other Member States with an interest in eCall issues. It is intended to provide a forum for discussions on implementation issues and for exchange of best practice. The first meeting of the Implementation Platform took place in February 2009.

## Standards

Three organisations are responsible for developing standards for eCall. Responsibilities for some specific elements have shifted between them during the process of developing the standards. The current position is that CEN TC278 Working Group 15 (eSafety) is responsible for the development of eCall standards at the application level. ETSI (the European Telecommunications Standards Institute) 3GPP (3<sup>rd</sup> Generation Partnership Project) – MSG (Mobile Standards Group) is concerned with the communication of eCall messages. Outside this Working Group, ETSI is also responsible for certification. ISO TC204 (International Standards Organisation Technical Committee on Transport Information and Control Systems) Working Group 16 (wide area communications/ protocols and interfaces) is also involved.

The standards cover two alternative approaches to sending details about the incident automatically: the cellular networks approach is based on attaching data to the GSM / 3G voice channel, while the Automatic Crash Notification approach (ACN) sends a digital message via any available media. ETSI has been considering three possible technical solutions: SMS, In Band Modem and Cellular Text Modem and has selected the In-band Modem.

The following standards are relevant to eCall:

- CEN TS15722: 2008 'Road transport and traffic telematics – eSafety – eCall minimum set of data (MSD)' - adopted and in the process of being published. This specifies that at least the following data will be available in the call to assist the emergency response: vehicle type, Vehicle Identification Number, vehicle propulsion storage, time, location, direction of travel, number of fastened seatbelts and service provider
- CEN TC278 work item 278220 'Pan-European eCall operating requirements' - is in draft form and specifies functional and operational requirements
- ISO DIS 24978 'ITS – Emergency and Safety Data Registry' - Draft International Standard approved for registration as a final draft; it covers the Automatic Crash Notification approach ETSI 3GPP TS 22.101 9.0.0 (2008-06) 'Technical Specification Group Services and System Aspects Service Aspects; Service Principles' – draft Technical Specification for service principles of integrated personal communications services, including emergency calls
- ETSI TS 26.267 'eCall Data Transfer – in band modem solution, general description' – Technical Specification due to be finalised in 2009
- ETSI TS 26.268 'eCall Data Transfer – in band modem solution, ANSI-C reference code' – Technical Specification due to be finalised in 2009
- ETSI TR 26.969 'eCall Data Transfer – in band modem solution, characterisation report' – Technical Report due to be finalised in 2009
- ETSI TS 26.269 'eCall Data Transfer – in band modem solution, conformance testing' – Technical Specification due to be finalised in 2009

In addition, there are new work items on:

- CEN TC278 WG15 'Third party support for eCall – operating requirements' - standardisation needs of private service providers offering eCall services – an initial draft has been prepared
- CEN TC278 'WG15 Quality of service requirements for eCall'
- CEN TC278 WG15 'eCall – High Level Application Protocols'.

## Research

The European Commission is funding a six month study which is investigating the potential **impact of eCall** in Europe which began in November 2008. The study is assessing the impact of eCall in terms of safety, environment, efficiency, economy, and identifying ethical, moral, legal and liability issues to support an assessment of policy options for supporting the deployment of eCall across Europe.

In 2008 the European Commission launched an **eCall Vehicle Identification Number (VIN) decoder** study to develop a common open decoder for extracting information from the VIN in the eCall message to enable PSAPs to use details of the vehicle to determine the emergency response.

Under the 7<sup>th</sup> Framework Programme the European Commission is supporting field operational tests on a range of services, including eCall, in the **TeleFOT** project (Field Operational Tests of aftermarket and nomadic devices in vehicles).

In addition, European Commission funding was provided through several research projects in the 6<sup>th</sup> Framework Programme on different aspects of the eCall service chain:

**SCORE** (Service of Coordinated Operational Emergency & Rescue using EGNOS) was one of the Galileo Joint Undertaking (GJU) projects; it developed and tested a prototype for locating the position of 112 emergency calls more accurately and reliably than is possible with current techniques. The project carried out field trials and presented final results and a public demonstration in March 2006.

The **GST Rescue** project was part of the GST (Global System for Telematics) Integrated Project and was designed to optimise the initialisation of in-vehicle eCall via an expert system and to optimise the eCall service chain by ensuring that in-vehicle data reach the emergency centres and then the emergency vehicles. The project carried out field trials in the UK (Sussex and London) during 2006 and is due to report in March 2007. The GST project provided a demonstration of eCall in Paris in June 2006.

The **SHARE** project worked to develop a service to provide emergency teams with multimodal communication and decision support. Emergency workers will receive on-site, on-line details of operational history and current operational status as well as access to relevant supporting information, in particular information about the incident environment. The SHARE system will incorporate an enhanced 2D-3D digital map, including more details on buildings and roads than are represented in basic digital road maps. The 2D-3D digital map will be enhanced with voice, image, text and video information. The map will be fully interactive so that emergency workers with mobile devices such as Personal Data Assistants (PDAs) and tablet PCs can query the system using a multimodal interface and retrieve information as well as entering new information during the operation.

## ■ TIMETABLE

In April 2006 the eCall Driving Group published recommendations on architecture, performance requirements and definitions of the Minimum Set of Data, and addressed certification and privacy issues. The recommendations were adopted by the eSafety Forum Plenary meeting in May 2006.

During 2006 the timetable for work towards eCall implementation was revised. Full scale field trials began in 2008; 10 Member States are planning or running pilots. Member States where national pilots have been carried out include Austria, the Czech Republic, Finland and Germany.

By September 2009, emergency services will need to upgrade their PSAPs so that they can process eCall location reports.

The European Commission is planning two eCall campaigns: aimed at decision makers in 2009 and end users in 2010.

The European Commission's aim is now for all newly type-approved vehicles to be fitted with equipment for eCall as "a standard option" from September 2010.

#### ■ eCALL IN THE UK

In the UK, 112 is operational and can be used as an alternative to 999. The two 1st level PSAP (telecoms) operators at national level receive location information and pass it on to the relevant 2nd level PSAPs (police, fire, ambulance and coastguard). The information can be passed to PSAP2 operators orally, but increasingly the information is transferred electronically as more control rooms are becoming equipped to receive it. Control rooms are also being equipped to visualise incident location information. The information can be transmitted to mobile data terminals in emergency vehicles with basic location and map displays. There are two commercial systems operating in the UK whereby vehicles involved in an emergency communicate directly with emergency services.

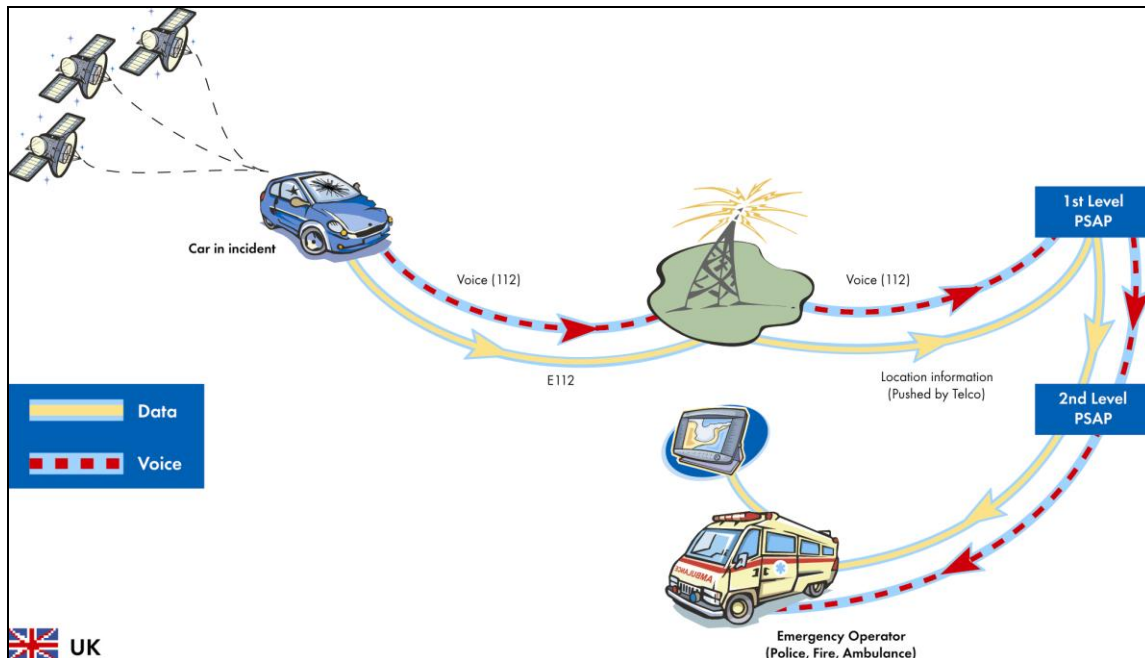


Diagram courtesy of eSafetySupport (<http://www.esafetysupport.org>)

In response to the European Commission's Communication, DfT recommended a formal evaluation of eCall in the UK context, looking at the business case, benefits, infrastructure and timescales. There are concerns that alternative ways of using national funds to achieve casualty reductions may be more cost-effective, that improvements in communications and response networks may not proceed rapidly enough to achieve the target date for implementation of eCall, and that the market for commercial services may develop without the need for government intervention. DfT has funded work to investigate the case for deployment of eCall in the UK, which investigated the business case for eCall, the issues and barriers to deployment and the impact on other initiatives. It considered the options for the UK related to signing the MoU. On the basis of the costs estimated for equipping vehicles and PSAPs and the benefits in terms of saving lives and reducing the severity of injuries and the assumptions made (such as the rate at which eCall would be fitted in vehicles), the study concluded that there is not a robust business case for eCall in the UK because the overall costs exceed the benefits. However if costs of equipping vehicles are excluded (on the basis that eCall may be available in vehicles anyway or if

<http://www.highways.gov.uk/itsradar>

users wish to buy equipped vehicles) it concluded that there is a business case for the government funding its own costs.

#### ■ WORK ON eCALL IN THE HIGHWAYS AGENCY

The Highways Agency is liaising with DfT on the study of eCall deployment in the UK.

The Highways Agency let a contract for a research project on the implications of eCall for the Highways Agency, starting in January 2007. The overall objectives are to:

- ensure that the HA is involved in developments related to eCall, both in Europe and the UK;
- identify actions that will enable the HA to be compliant with eCall standards and to deliver improved services based on eCall;
- assess the implications of eCall for the Highways Agency, including an assessment of the operational costs and benefits.

#### ■ BIBLIOGRAPHY

eIMPACT 2008. Socio-economic assessment of stand alone and cooperative Intelligent Vehicle Safety Systems (IVSS) in Europe. D6. Available at: <http://www.eimpact.info/results.html>

European Commission COM(2003) 311 final. European Road Safety Action Programme: Halving the number of road accident victims in the European Union by 2010: A shared responsibility.

European Commission COM(2005) 431 final. The 2<sup>nd</sup> eSafety Communication: Bringing eCall to citizens.

European Commission COM(2006) 723 final. Bringing eCall back on track – Action Plan (3<sup>rd</sup> eSafety Communication).

European Commission 2008. eCall – saving lives through in-vehicle communication technology. General Fact Sheet 49 June 2008.

European Commission COM(2008) 886 final. Action Plan for the Deployment of Intelligent Transport Systems in Europe.

Bob Williams. A comparison of Emergency Notification Proposals. Private Communication.

The EC-funded eSafety Support project provides comprehensive background information about eCall, including the European policy documents, membership of the eCall Driving Group and details of the status of eCall in the various Member States in its eCall 'Toolbox': [http://www.esafetysupport.org/en/ecall\\_toolbox/](http://www.esafetysupport.org/en/ecall_toolbox/)

EMERGE and SEiSS project: Exploratory Study on the potential socio-economic impact of intelligent safety systems in road vehicles: [http://www.esafetysupport.org/download/socio\\_economic\\_studies/Final\\_SEiSS.pdf](http://www.esafetysupport.org/download/socio_economic_studies/Final_SEiSS.pdf)

GST RESCUE project: [http://www.gstforum.org/en/subprojects/rescue/about\\_gst\\_rescue/](http://www.gstforum.org/en/subprojects/rescue/about_gst_rescue/)

Mclure D and Graham A 2006. –eCall – the Case for Deployment in the UK. Report to DfT. SBD/TEL/1100a, Secure By Design.

SCORE project: <http://www.score112.org/home.htm>

SHARE project fact sheet is available from the CORDIS web site using the link below: [SHARE project fact sheet](#)

TeleFOT project: <http://www.telefot.eu>

Virtanen N, Schirokoff A, Luoama J, Kulmala R 2006. Impacts of an automatic emergency call system on accident consequences. Ministry of Transport and Communications, Finland. Finnish R & D Programme on Real Time Transport Information, AINO.

## ■ GLOSSARY

ACN	Automatic Crash Notification
CARE	Community Road Accident Database
CEN	Comité Européen de Normalisation
EGNOS	European Geostationary Navigation Overlay Service
ETSI	European Telecommunications Standards Institute
EU-25	The 25 Member States of the European Union
GJU	Galileo Joint Undertaking
GNSS	Global Navigation Satellite System
GSM	Global System for Mobile communications
GST	Global System for Telematics project
ISO	International Organisation for Standardisation
MoU	Memorandum of Understanding
MSD	Minimum Set of Data
PDA	Personal Data Assistant
PSAP	Public Service Answering Point
SCORE	Service of Coordinated Operational Emergency and Rescue using EGNOS project
SEiSS	Socio-Economic impact of intelligent Safety Systems
TeleFOT	EC funded programme of Field Operational Tests of aftermarket and nomadic devices in vehicles