Identifying ITS Opportunities for the HA

Standards Newsletter: October 2009

ITS Radar International Project

This project is providing intelligence for the Highways Agency on ITS developments in Europe and around the world. It is carried out by TRL and AECOM on behalf of the HA. The project summarises key information for decision makers and practitioners on activities related to Intelligent Transport Systems (ITS). The project covers specific areas of key interest to the HA.

Regular newsletters are being produced, covering information which is in the public domain. For more information about the project and the services provided, the web site can be reached at: www.highways.gov.uk/itsradar.

To contact us and let us know what you would like this project to deliver please email us at: ITSRadarInternational@trl.co.uk

About Standards

A standard is a technical specification or report that is developed with consensus across industry and is then approved by a body recognised at the national or international level. Standards specify how systems, products and services should operate. Standards should facilitate inter-operability without impeding innovation as new technologies and approaches develop.

ITS Radar International aims to keep the HA informed on developments in standards relevant to ITS, at a national (British Standards Institution, BSI), European (Comité de Européen Normalisation, CEN, and European Telecommunications Standards Institute, ETSI) and international (International Organisation for Standardisation, ISO) level.

A document will be periodically maintained, which tracks the progress of new and developing standards, as well as listing published standards with any updates or reviews. The ITS Standards Spreadsheet can be downloaded from www.itsradarinternational.info/. The main ITS technical committees are:

- ISO TC 204 Technical Committee – Intelligent Transport Systems
- CEN TC 278 Technical Committee – Road Transport & Traffic Telematics
- ETSI TC ITS Technical Committee – Intelligent Transport Systems

These and other relevant bodies are regularly monitored for developments.

In addition, the project provides information about agreements, protocols, common approaches and guidelines relevant to ITS in the Highways Agency, such as location referencing and data exchange.

■ MEETINGS

International Conference on ITS Telecommunications, Lille, October 20-22

Source: http://itst2009.inrets.fr/

The 9th International Conference on ITS Telecommunications will be held in Lille, October 20-22, 2009. It will bring together engineers and scientists in the field of New Technology of Information and Communication for Intelligent Transport Systems (NTIC for ITS).

The preliminary programme can be downloaded from the website, itst2009.inrets.fr/. The programme includes a workshop and demonstration from the Geonet Project, which is concerned with developing specifications for vehicle-to-vehicle communication.

ITS Radar International will monitor outputs from the conference

■ HOT TOPICS

eCall Standardisation Update

Source: www.esafetysupport.org/, www.3gpp.org/eCall

Development of standards for the EC-supported pan-European emergency call service, "eCall" is continuing to make progress. In this month's newsletter, recent progress is reported on along the two main strands:

- **CEN TC 278 Working Group 15 (eSafety) –** responsible for the development of eCall standards at the application level; (click here for ITS Radar International article)
- **3GPP and ETSI-MSG (3rd Generation Partnership Project) and (European Telecommunications Standards Institute, Mobile Standards Group) –** concerned with the communication of eCall data and voice messages; (click here for ITS Radar International article)

In parallel to these two strands of work, further work is being developed by ISO TC 204 Working Group 16, based on efforts in the USA. ISO FDIS 24978, "ITS Safety and emergency messages using any available wireless media – Data registry procedures", defines an approach that sends a digital message via any available wireless media, rather than attaching data to the GSM / 3G voice channel. It is a Final Draft International Standard, which is awaiting voting prior to being published.

Further details on the latest developments in eCall, as well as the ITS Radar International eCall Fact Sheet (Jan 09), can be found at www.itsradarinternational.info/.

ITS Radar International will continue to monitor developments in eCall

eCall Standardisation Update - CEN TC 278 Working Group 15

Source: www.esafetysupport.org/

CEN TC 278 Working Group 15 (eSafety) is responsible for the development of eCall standards at the application level. The following draft work items (WI) and technical specifications are relevant to eCall and sit within the eSafety Working Group 15, in CEN TC 278:

- CEN TS 15722:2008 "eSafety – eCall minimum set of data (MSD)" – adopted as TS in 2008, to be upgraded to EN, target publication Spring 2010
- CEN WI 278220 "Pan-European eCall operating requirements" – Draft, comments received, target publication Autumn 2010
- CEN WI 278243 "eCall – High Level Application Protocols" – Under development, target publication Autumn 2010
- CEN WI 278244 "eCall – Operating requirements for third party support" – under development, target publication Autumn 2010
- CEN WI 278245 "eCall – Quality of service requirements" – Preliminary, work has not yet commenced
- CEN WI 278246 "eSafety – Third party emergency support services" – Preliminary, work has not yet commenced

Minimum set of data (MSD)

This draft European Standard defines the data content that comprises the Minimum Set of Data (MSD) that is transferred from a vehicle to a Public Safety Answering Point (PSAP) in the event of a crash or emergency, via an 'eCall' communication link.

The MSD is an important source of information to assist the provision of the most appropriate and timely services to the crash site. The MSD 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. The minimum set of data makes it possible for the PSAP operator to respond to the eCall even without the voice connection.

This draft standard was approved as a Technical Specification (TS) in 2008 and is expected to be processed to achieve European Standard status.

Pan-European eCall operating requirements

This draft standard will specify the functional and operational requirements and intrinsic procedures for eCall services to a Public safety Answering Point (PSAP). A pan-European in-vehicle emergency call system will automate the notification of a traffic accident, wherever it occurs in Europe, according to the defined technical standards and a defined quality of service. This will be achieved using a mobile communication network (e.g. GSM) and the European pre-assigned emergency destination address (112), and includes a means of manually triggering incident notification.

Currently this is a draft Technical Specification and when formally approved is expected to be processed to achieve European Standard status.

eCall - High level application protocols

The operating requirements for pan-European eCall will utilise Public Land Mobile Networks such as GSM and 3G, which are specified in a number of standards and technical specifications.

In order to provide the eCall service across a wireless network, high level application protocols will be an essential element for this service provision. This draft European Standard will specify the protocols required for pan-European eCall operation using Public Land Mobile Networks and will identify common elements that can be used in the link between third party services supporting eCall and Public Safety Answering Points (PSAP). The standard is specified as high-level, because it does not define the product design, rather the steps required of a manufacturer to provide a system which will function in an interoperable open environment.

In February 2009 an open call was issued to assemble a project team of experts to work on the standard, with drafting to be complete within 27 weeks of work commencing.

eCall – Operating requirements for third party support

There are two means to provide an eCall from a vehicle:

- The pan-European in-vehicle emergency call eCall, which sends the voice call and the data directly to the PSAP, using the emergency number 112.
- Alternatively, there is the possibility of providing eCall support to PSAPs using Third Party Services Provider (TPSP). This eCall variant will include the transmission of data to a third party service provider and the establishment of a voice call with this provider. In the event of an emergency, the TPSP will establish voice connection with the most appropriate PSAP and forward all relevant information concerning the event, including the information specified by the minimum set of data (MSD). The TPSP will also enable communications between the PSAP and the crash vehicle occupants.

This draft TS considers the standardisation needs of private emergency call service providers, in conjunction with the pan-European eCall service. According to eSafetySupport, this work item is not essential for the deployment of the eCall service and as such is not on the critical path.

eCall – Quality of service requirements

The eSafety working group has discussed and agreed the need to define the Quality of Service Requirements for an eCall system. This requirement has been proposed to the CEN secretariat as a new work item. Following approval, the eSafety working group will consider the scope of the service requirements, prior to formally developing and defining the specific requirements.

eCall – Third party emergency support services

There have been discussions within the standards working group regarding what additional emergency services can be provided by third party service providers, which should be standardised and which should remain proprietary.

Currently this work item is not essential for the deployment of the eCall service and as such is not on the critical path.

Further details on the latest developments in eCall, as well as the ITS Radar International eCall Fact Sheet (Jan 09), can be found at www.itsradarinternational.info/.

ITS Radar International will continue to monitor developments in eCall

eCall Standardisation Update - 3GPP and ETSI-MSG

Source: www.3gpp.org/eCall

3GPP (3rd Generation Partnership Project) and ETSI-MSG (European Telecommunications Standards Institute, Mobile Standards Group) are responsible for developing standards for the communication of eCall data and voice messages.

3GPP was set up in 1998 as a collaboration of several telecommunications standardisation bodies, in order to produce standards for '3G' mobile communications. ETSI-MSG is a partner in 3GPP.

As of October 2009, there are four 3GPP work items in direct relation to the communications required for eCall. A series of technical specifications (TS) and technical reports (TR) will detail the chosen method of the "in-band modem":

- "eCall Data Transfer; In-band modem solution;"
  - 3GPP TS 26.267 "General description" – Version 8.1.0, published June 2009
  - 3GPP TS 26.268 "ANSI-C reference code" – Version 8.1.0, published June 2009
  - 3GPP TS 26.269 "Conformance testing" – Version 8.0.0, published June 2009
  - 3GPP TR 26.969 "Characterisation report" – Version 1.0.0, draft, to be finalised in 2009

The four documents can be downloaded from www.3gpp.org/.

3GPP TS 26.267, "General description", defines the concept of the eCall In-band Modem as:

> "Modem pair, consisting of transmitters and receivers at the In-Vehicle System (IVS) and the Public Safety Answering Point (PSAP) that operates full-duplex [transmission of data in two directions simultaneously] and allows reliable transmission of eCall Minimum Set of Data from IVS to PSAP via the voice channel of the emergency voice call through cellular and PSTN networks."

The document describes in detail the functional blocks and data flows, in particular the transmitters and receivers for both the IVS and PSAP. A key aspect is that when prompted by a request from the PSAP operator for the MSD, the speech is muted from the motorist for the duration of data transmission to prevent interference. Other potential solutions had been considered, such as SMS and cellular text telephone modem (CTM) in 3GPP

TR 26.967; however, these were found to be insufficient to meet eCall requirements, due to heavy distortion and other complications.

The IVS receiver monitors the feedback messages from the PSAP data modem until it receives the 'ACK' acknowledged confirmation. At this point the PSAP terminates the data connection and the voice channel is restored. The series of standards are based on the assumption that the MSD is no larger than 140 bytes, in line with CEN TS 15722:2008.

3GPP TS 26.268, "ANSI-C reference code", contains the computer coding language required to undertake the various functions specified in 3GPP TS 26.267.

3GPP TS 26.269, "Conformance testing", explains the testing procedures for eCall modem implementations. Conformance testing of the IVS and PSAP transmitters is performed by comparing a specific input sequence with the reference C-code given in 3GPP TS 26.268. A similar method can be performed for the receivers, or alternatively by testing against a set of minimum performance requirements. The document specifies the minimum performance requirements, test procedures and digital test sequences.

3GPP 26.969, "Characterisation report", provides the performance results from various tests carried out under both normal and abnormal operating conditions. Performance is measured predominantly in terms of maximum and average transmission time; however, some tests are based on failure rate. This is currently a draft technical report and is to be finalised by September 2009.

3GPP TS 22.101 "Service aspects; Service principles", is another 3GPP technical specification relevant to eCall. It describes the service principles for public land mobile networks (PLMNs) specified by 3GPP. One section relates specifically to emergency 112 calls.

Further details on the latest developments in eCall, as well as the ITS Radar International eCall Fact Sheet (Jan 09), can be found at www.itsradarinternational.info/.

ITS Radar International will continue to monitor developments in eCall

New open-source dynamic location referencing method published by TomTom is "of great interest to the industry"

Source: www.tomtom.com/, www.tisa.org/, www.ertico.com/

TomTom has launched an open-source, royalty-free dynamic location referencing method, called "OpenLR". This is a new method, which joins the recently published ISO standard, "AGORA-C" approach, in this work area. The Traveller Information Services Association (TISA) says that "the open source, royalty free nature of the technology is of great interest to the industry".

Why is this important?

In a summary presentation, TomTom describes the relevance of dynamic location referencing to the EC ITS Action Plan, and also as a requirement for the deployment of many ITS systems and services. It is hoped that OpenLR will facilitate the roll-out of dynamic location referencing in the mass market through:

- "The support of the leading market players
- An open and interoperable environment
- No/limited royalty fees
- No business limitations
- No technical restrictions for user groups and individual users"

The website continues:

> "…This will facilitate new business opportunities in various areas of ITS, such as traffic information services, map content exchange and co-operative systems, where precise and compact dynamic location information is needed."

What is location referencing?

Location data can be used for anything that needs to be accurately linked to a specific piece of or position on the road network. It can range from static road sign information to highly dynamic traffic and weather information, as well as safety-critical information.

Location referencing is the task of ensuring compatible referencing of locations when information is exchanged between different applications or systems with different geographic databases. There are two fundamental methods for location referencing defined in ISO 17572:2008 Parts 1-3, "Location Referencing for Geographic Databases":

- ISO 17572-2:2008 – The first method assumes common pre-coded tables, such as the European Traffic Message Channel (RDS-TMC).
- ISO 17572-2:2008 – The second method, Dynamic Location Referencing (DLR), varies in real-time. This was developed from the European "AGORA-C" proposal.

The amount of locations fit to be transferred is limited when using pre-coded locations. However, in dynamic location referencing every location in a map can be transferred.

TISA say that "dynamic location referencing is very important for travel information technologies such as TPEG, because it lets messages refer logically to a specific point in the transport network without pre-coding the location and with the capability to be correctly decoded in a terminal device that doesn't need to be using the same map".

How does OpenLR work?

The new OpenLR method works by identifying several "location referencing points" (LRPs) and then joining these by the shortest path.

> "Basic idea: a concatenation of a shortest path between LRPs covers the location completely. At least two LRP are needed for start and end of the location. Intermediate LRPs serve as a guide for the route calculation."

Further information on the new approach, including a summary presentation and a technical document can be downloaded from www.tomtom.com/. The open-source code library is to be published soon.

Previous ITS Radar International location referencing articles can be found at www.itsradarinternational.info/.

ITS Radar International will continue to monitor developments in location referencing

■ Recent Publications

TISA publishes guidelines for transmission of Location Table Country Codes in TMC

Source: www.ertico.com/

The Traveller Information Services Association (TISA) has published specification and guideline documents for the explicit transmission of Location Table Country Codes in TMC (Traffic Message Channel).

According to ERTICO,

> "The specification and guideline contain comprehensive instructions on the technical method and deployment conditions for enabling a service provider to transmit the Location Table Country Code (LTCC) explicitly and separately from the Country Code contained in the PI code (PICC) of an FM RDS broadcast, therefore overcoming issues noted with TMC deployment in some markets."

The specification, "SP09008", and guideline, "SP09009", documents are available to TISA members on the Documents page of the TISA website: www.tisa.org.

Article: Common Standards for Ethernet Wired Communication Networks

Source: ITS International (July/August 2009) p.47-48

The July/August 2009 edition of ITS International contains an article discussing the needs and challenges of using wired networks for ITS communication. It discusses to what extent Ethernet with optical fibres is required, and furthermore how it can be used in conjunction with wireless networks.

■ Calls for Proposals

None to report

■ Projects

None to report

■ Glossary

3G	3rd Generation: Third generation of mobile wireless technology that features high speed transmission, global roaming and advanced multimedia access
3GPP	3rd Generation Partnership Project
ACK	Acknowledged

AGORA-C	implementAtion of Global lOcation Referencing Approach: Dynamic method for location referencing, which forms the basis of ISO 17572, Part 3.
ANSI-C	American National Standards Institute (ANSI) standard for the C programming language
CEN TC 278	CEN Technical Committee for Road Transport and Traffic Telematics
CTM	Cellular Text telephone Modem
DLR	Dynamic Location Referencing
EC	European Commission
eCall	Emergency Call: European in-vehicle Emergency call service that automatically contacts emergency services if the vehicle is involved in an accident. For vehicles under development in Europe, promoted by the European Commission.
EC ITS Action Plan	An action plan adopted in December 2008 by the EC to create the momentum necessary to speed up market penetration of mature ITS applications and services in Europe.
EN	European standards maintained by CEN
ETSI	European Telecommunications Standards Institute
ETSI-MSG	European Telecommunications Standards Institute, Mobile Standards Group
ETSI TC ITS	European Telecommunications Standards Institute Technical Committee for Intelligent Transport Systems
Geonet Project	A European project to implement a reference specification of a geographic addressing and routing protocol with support for IPv6 to be used to deliver safety messages between cars but also between cars and the roadside infrastructure within a designated destination area
GSM	Global System for Mobile Communications: Digital cellular telephony system, "circuit-switched", designed for voice applications. Used in ITS services such as traffic information, emergency call and fleet management
ISO TC 204	ISO Technical Committee for Intelligent Transport Systems
ITS	Intelligent Transport Systems: "The integration of information and communications technology with transport infrastructure, vehicles and users" [ERTICO]
IVS	In-Vehicle System
Location referencing	The task of ensuring compatible referencing of locations when information is exchanged between different

	applications or systems with different geographic databases
LRPs	Location Referencing Points
LTCC	Location Table Country Code
MSD	Minimum Set of Data
NTIC for ITS	New Technology of Information and Communication for Intelligent Transport Systems
OpenLR	An open-source, royalty-free dynamic location referencing method launched by TomTom
PICC	Programme Identification Code: Unique identification code for each FM radio station. PI Codes are used by RDS for auto-tuning to the same station when the car moves between different transmitter areas
PLMNs	public land mobile networks
PSAP	Public Safety Answering Point
PSTN	Public Switched Telephone Networks
RDS	Radio Data System: Digital channel transmitted within the FM radio wavelength used to relay traffic messages
RDS-TMC	Radio Data Systems incorporating a Traffic Message Channel, a digital channel used to provide silent, coded messages to in-vehicle applications in order to display route and traffic information in a user's native language
SMS	Short Message Service
TISA	Traveller Information Services Association
TPEG	Transport Protocol Experts Group
TPSP	Third Party Services Provider
TR	Technical Report
TS	Technical Specification
WI	Work Item