



(in particular the emergency agencies, the public PSAPs and the private PSAPs operating under the regulation of a public body), together with other relevant parties such as the insurance industry, automobile clubs and other related industries.

An EC Directive could help ensure Member State approval and commitment. The momentum for such a directive already exists within the European Commission, with the White Paper "European Transport Policy for 2010: Time to Decide" targeting a 50% reduction in road victims by 2010 — a goal that can be in part achieved through the implementation of systems such as E-MERGE.

Finally, a certification for telematics safety services could provide motoring consumers with a realistic and independent assessment of the telematics safety performance of cars sold in Europe. Certifying E-MERGE-compliant eCall equipment and services could provide an important push towards full deployment and implementation.

Today the discussion on the deployment is carried out in the eSafety Forum Driving Group on eCall, which is co-chaired by ERTICO. Anyone having an interest in the deployment of eCall and who wants to take part in the related discussions should participate in this important group.

Routes to Deployment

With the E-MERGE tests successfully completed, deployment now depends on the coordinated adoption of the architecture. First, however, Member States must ensure the complete implementation of E112 in Europe. PSAPs then need to upgrade their E112 solution to also handle the E-MERGE minimum set of data.

Realisation of eCall requires a high degree of cooperation and a lot of commitment from many private and public stakeholders. The project consortium has identified two paths to deployment for the E-MERGE eCall solution:

- A voluntary approach involving all stakeholder groups as a preferred option. The eSafety Forum Driving Group on eCall is preparing to launch a Memorandum of Understanding (MoU) for securing the commitment of key stakeholders to this goal.
- An alternative approach could be that Member States and the EC create a Directive on eCall. However, the voluntary approach is preferred to EU legislation as it has the potential to lead to implementation faster.

The willingness and commitment of key players is critical to the implementation of the potentially life-saving solution offered by E-MERGE, thus making efforts such as the MoU important steps towards success. Cooperation must be encouraged between the vehicle makers, telecom operators, the EC and Member States



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 Mizar Automazione • ODPM • PSA Peugeot-Citroën • RACC • SEAT • SOS Alarm AB • Telmacon • VTEC (Volvo)
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E-MERGE

Enhanced emergency response



through deployment of E-MERGE compliant eCalls



Increased Safety through Pan-European eCall Capabilities

With over 40,000 lives lost each year, reducing the death toll on Europe's roads is not an option, it is a must! Improving the speed and accuracy of the delivered emergency response can help, potentially cutting fatalities by 5%, injuries by 10% and associated costs by €4 billion.

The E-MERGE project has targeted this goal by taking the first step towards ensuring the availability and functioning of vehicle-based emergency call systems. By ensuring the rapid (automatic, if necessary) delivery of location information to the Public Safety Answering Points (PSAPs), lives can be saved. Accidents can be dealt with more rapidly and efficiently across the European Union, regardless of vehicle. The project has defined a common pan-European in-vehicle emergency call infrastructure. This includes the minimum set of data (MSD) with the vehicle location, the transmission protocol for routing the call, and the full set of data (FSD) with more extensive information about the vehicle, its occupants and crash intensity. The result is a platform that can help reduce fatalities and has the potential to be the next standard on the same level as seatbelts and airbags.

E-MERGE: A First Step to Deployment

Part of the IST Programme, the E-MERGE project was supported by the European Commission (EC) Information Society Directorate General and managed by ERTICO – ITS Europe. The consortium —

which included partners from the car industry, public authorities, emergency call centres and service providers — began work in April 2002 and concluded end of March 2004. Its task was to develop, test and validate common specifications for the vehicle emergency call at all levels along the service chain and to ensure that the technical, organisational and business structure is available for a Europe-wide take-up of the solution.

Based on the EC's recommendations concerning E112 across Europe, E-MERGE defined the in-vehicle system (the generating element of the emergency call), the data sets to be delivered and the transmission protocols. It conducted tests in laboratories as well as six EU countries, surveyed participating PSAPs to determine confidence in the system and examined the necessary steps for the E-MERGE solution to be deployed.



The Volvo test vehicle manual emergency call button was located in the dashboard.



During the tests in Spain, the RACC received information and generated a map-linked locations.

Testing and Validation Paves the Way

An E-MERGE emergency call is triggered by the activation of in-vehicle sensors (airbag deployment, rollover, etc.) or manually, if the user pushes the SOS button. This eCall is transferred to the PSAP, the call centre responsible for providing a first point of contact to an emergency 112 call. The PSAP receives the 112 voice call and the minimum set of data (MSD) as defined by E-MERGE (i.e. time and location, vehicle details, triggered sensors, direction of travel, service provider information).



PSAP operators, such as this one at the Swedish test site, are better able to respond to the emergency call due to the E-MERGE minimum set of data.



Emergency response vehicles, such as this one at the German test site, can arrive on the scene faster when supplied with the minimum set of data defined by E-MERGE.

If the caller subscribes to a private service provider (SP), the in-vehicle system also transmits more extensive data (FSD) about the vehicle and its occupants to the SP. This option not only makes additional information available to the PSAP (via the SP), but also permits service delivery in the driver's native language when abroad. This information will then allow the PSAPs to better guide how the call and response (e.g. dispatching of vehicles) will be managed by the responding agency, such as the police, ambulance, health care rescue or fire brigade.



During the real-life tests, these three vehicles (Volvo, Seat and Fiat, as well as an Opel not pictured) checked cross-border functionality by linking with local PSAPs and SPs in the country of origin.

The project took a three-step approach to testing the E-MERGE solution:

- **laboratory testing** — at partner locations with their own equipment and simulators. Four scenarios run with more than 1500 tests performed to ensure correct transmission/reception of data between the four elements within E-MERGE.
- **integration testing** — the relation between two components of the service chain tested at each test site. Five scenarios run with more than 500 beta tests performed to simulate different integration of the transfer of data between the four elements within E-MERGE.
- **real-life testing** — testing in real-life conditions in six EU countries (Sweden, Spain, Germany, UK, Italy and the Netherlands). Designed to simulate pan-European coverage with E-MERGE equipped cars driving through the various countries accessing the local PSAP with a link to the SP of the car owner's country. More than 300 real-life tests performed to evaluate response times of the different chains and the roaming (vehicles driving around Europe).

Results Show E-MERGE on Right Path

The E-MERGE cross-border testing proved quite successful with 100% error-free testing along the entire service chain. From the testing it was clear that using SMS for the data transfer is not recommended as gamma tests showed that the time for transferring data between the different elements within E-MERGE differed from 2 to 260 seconds, which is not acceptable. E-MERGE therefore developed a specification for sending the minimum set of data in the open voice channel. This also ensures that the data reaches the operator that handles the voice call.

In addition to the test results themselves, a survey of the test sites provided some insight into stakeholder acceptance of such a system. Overall, it was felt that E-MERGE adds significant value to rescue operations, especially in the more complicated cases where the correct first initiated response to an incident is crucial.



The UK test site used a Sussex police car equipped with this in-vehicle display and interface to visualise the minimum set of data (MSD).

The Sussex Police patrol car in-vehicle interface could display location data on a map of the incident area.



The manual emergency call button for the Seat test vehicle was located above the rear-view mirror.

Based on the project's investigations, a full-scale deployment of the E-MERGE system is expected to lead to a decrease in fatalities and severe injuries in traffic accidents as follows:

- Fatality: 5% reduction
- Severe Injuries: 10% reduction to light injuries
- Light Injuries: No positive effect foreseen

That level of reduction would mean 2000 lives saved each year. It has been calculated that this will also save the European Community nearly €4 billion each year in related social and health costs and lost "public" income. The savings will be related mainly to three stakeholder groups:

- public authorities (medical, market productivity, congestion)
- insurance companies (medical, legal costs, productivity, administration costs)
- individual drivers (medical, legal costs, market and productivity)

eCall Service Chain

