D1.3 Final Report

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ICT Policy Support Programme  
Communications Networks, Content and Technology
## CONTROL SHEET

### Version history

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### Other information

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### Circulation

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1 Executive summary

Document Purpose
This document is the final publishable report for the HeERO2 project, which started in January 2013 and activities concluded for the 6 Pilot Sites in December 2014.

This report draws together all of the activities and results from the project, and delivers them in a single publishable document, suitable for public dissemination. The report concludes with conclusions and lessons learned from the project.

Main Results
The goals of the project were:

- To evaluate the published standards on eCall based on 112,
- To prepare the pilot sites for eCall deployment.

These requirements have been met. The overall conclusion confirms that eCall based on 112 is performing according to expectations in line with the current evolution of the necessary equipment, but more work will be required, especially for the continued development of In-Vehicle equipment (IVE) to reach production quality.

The performance indicators have shown that there is a strong case for a unified conformity assessment for PSAPs across Europe, coupled with further work required on the IVE to ensure that it is ready for production.

The issue of data privacy for eCall based on 112 are robust and have been in operation for a number of years (112 Call dispensation); however TPS eCall is largely unregulated, and does not carry the same safeguards for the citizen.

VIN decoding is necessary during the rescue sequence. However not all Member States are permitted access to the EUCARIS system for vehicle registration details. There are commercially available VIN decoding programmes which will provide the initial information necessary to mobilise rescue services, however EUCARIS remains the Gold Standard for the provision of both vehicle and vehicle owner information.

The lack of clarity for a start date for eCall deployment across Europe, which was identified in the final report for HeERO1, is slow being removed. The member state PSAPs' now have a defined start date of the 1st October 2017, with the vehicle manufacturers producing vehicles fitted with eCall based on 112 around the end of March 2018 (this is subject to confirmation).

Mobile Network operators (MNO) should continue to upgrade their networks for the eCall Flag in line with the original GSMA commitment to upgrade by December 2014. At the time of writing this report it was noted that the majority of MNO had failed to honour the pledge
made by GSMA to ensure that the upgrade was carried out. This report is aware that there are a number of MS where the MNO have refused to upgrade until legally required to do so. Clearly this is an unsatisfactory state of affairs. The activities in HeERO2 have shown conclusively that the upgrade of the network with the eCall discriminator had an unpredictable effects in one pilot site (Luxembourg) The report urges the European Commission to take action to resolve this issue.

With 239 million vehicles on the roads in Europe consideration should be given to the introduction of aftermarket devices, currently there are no specific requirements applying to the introduction of aftermarket devices that would be capable of delivering eCall based on 112. This report is aware that there are a number of device manufacturers who propose to use mobile devices as the network access device, or even the device itself. The majority of the effort has been placed into the fitment of eCall devices into new cars, however with the size of the existing vehicle fleet in Europe this presents a significant commercial opportunity, which to date is largely unregulated. The report is aware of the forthcoming report from the EeIP task force RETRO that will make recommendations on this matter. This report should be published in draft form by May 2015.

The Periodic Test Inspection (PTI) of the IVE needs to be formalised across Europe. This is the first time that a safety device has been mandated for use in a vehicle across Europe. It is correct that this device should form part of the annual certification of vehicle fitness according to the specific rules for each member state. The EeIP taskforce PTI is continuing to work on this matter, and will again report at the next EeIP.

eCall will substantially change the management of incidents on the road of Europe. This will require new operating procedures to make best use of the additional information that eCall provides. This applies to both the PSAP (All levels) and the Traffic Management Centres. The HeERO projects have made a good start in this respect, working across 14 MS.
## 2 Terms and abbreviations

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<td>Advanced Message Queuing Protocol</td>
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<td>Application Programming Interface</td>
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<td>Demilitarized zone network</td>
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<td>Description of Work</td>
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<td>Global Navigation Satellite System</td>
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<td>GPRS</td>
<td>General Packet Radio Service</td>
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<td>GPS</td>
<td>Global Positioning System</td>
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<td>GSM</td>
<td>Global System for Mobile Communications</td>
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<td>HAK</td>
<td>Croatian Automobile Club/Hrvatski Autoklub</td>
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<td>HGV</td>
<td>Heavy Goods Vehicle</td>
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<td>HLAG</td>
<td>High Level Application</td>
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<td>ICT PSP</td>
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<td>ICT</td>
<td>Information and Communications Technology</td>
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<td>ISDN</td>
<td>Integrated Services Digital Network</td>
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<td>Acronym</td>
<td>Full Form</td>
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<tr>
<td>IVE</td>
<td>In-Vehicle Equipment (Formerly In-Vehicle System)</td>
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<td>IVV</td>
<td>International Association for Driver Education</td>
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<td>KPI</td>
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<td>MESRE</td>
<td>Mobile Emergency Service for Resuscitation and Extrication</td>
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<td>MNO</td>
<td>Mobile Network Operator</td>
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<td>MS</td>
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<td>MSC</td>
<td>Mobile Switching Centre</td>
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<td>MSD</td>
<td>Minimum Set of Data</td>
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<td>MSS</td>
<td>Multi-Service Switching</td>
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<td>MTS</td>
<td>Manual Test Scenario</td>
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<td>NACK</td>
<td>Negative Acknowledgement</td>
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<td>NAD</td>
<td>Network Access Device</td>
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<td>National Police Agency</td>
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<td>NRN</td>
<td>Network Routing Number</td>
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<td>OEM</td>
<td>Original Equipment Manufacturer</td>
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<td>Private Branch Exchange</td>
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<td>Public Land Mobile Network</td>
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<td>P-PSAP</td>
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<td>PSAP</td>
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<td>PSTN</td>
<td>Public Switched Telephone Network</td>
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<td>RAN</td>
<td>Radio Access Network</td>
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<td>RDS-TMC</td>
<td>Radio Data System - Traffic Message Channel</td>
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<td>RRA</td>
<td>Romanian Railway Authority</td>
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<td>RTP</td>
<td>Real-time Transport Protocol</td>
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<td>RWS</td>
<td>Ministry of Transport, Rijkswaterstaat</td>
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<td>SBAS</td>
<td>Satellite-Based Augmentation System</td>
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<td>SIM</td>
<td>Subscriber Identity Module</td>
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<td>Session Initiation Protocol</td>
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<td>Secure Sockets Layer</td>
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<td>SW</td>
<td>Software</td>
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<td>TCP/IP</td>
<td>Transmission Control Protocol/Internet Protocol</td>
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<td>TMC</td>
<td>Traffic Management Centre</td>
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<td>TPS</td>
<td>Third Party Services</td>
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<td>TPS</td>
<td>Third Party System</td>
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<td>UMTS</td>
<td>Universal Mobile Telecommunications System</td>
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<td>VIN</td>
<td>Vehicle Identification Number</td>
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<td>VoIP</td>
<td>Voice over Internet Protocol</td>
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<td>WAN</td>
<td>Wireless Area Network</td>
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<tr>
<td>XML</td>
<td>Extensible Mark-up Language</td>
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3 Introduction

3.1 Purpose of the document

This document is the final publishable report for the HeERO2 project, which started in January 2013 and activities concluded for all 6 pilot sites in December 2014.

This report draws together all of the activities and results from the project, and delivers them in a single publishable document, suitable for public dissemination. The report concludes with conclusions and lessons learned from the project. Many of the lessons learned have already been adopted by the I_HeERO proposal, which will look at PSAP upgrade and eCall advancement. The proposal was submitted in February 2015.

3.2 Structure of the document

D1.3 Final Publishable report is structured in the following manner

Executive Summary

Final Publishable Summary

Project Objectives
Activities in response to the objectives
Results
Dissemination Activities
Conclusions and Lessons Learned.

3.3 HeERO2 Contractual References

HeERO2 is a Pilot type A of the ICT Policy Support Programme (ICT PSP), Competitiveness and Innovation Framework Programme (CIP). It stands for Harmonised eCall European Pilot.

The Grant Agreement number is 325075 and the project duration is 24 months, effective from 01 January 2013 until 31 December 2014

It is a contract with the European Commission, DG CONNECT.

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Any communication or request concerning the grant agreement shall identify the grant agreement number, the nature and details of the request or communication and be submitted to the following addresses:

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Table 1 HeERO2 Beneficiaries

1 Those partners that are greyed out indicate partners who left the project whilst the project was still active.
5 Final Summary Report

5.1 HeERO2 Project Objectives

The overall project objective for HeERO2 was to prepare for the deployment of the necessary infrastructure in Europe with the aim of making the harmonised Pan-European interoperable in-vehicle emergency call service eCall based on 112 a reality.

The implementation of the eCall service at European level took into account two major conditions on which its successful operations will depend:

1. Interoperability and cross border continuity: the possibility for any vehicle from any European country travelling across Europe to use the eCall service in case of a serious accident should be a service key driver. The interoperability issue covers not only the technical solution but also operations aspect.

2. Harmonisation: the eCall service can work properly across Europe only if developed in a harmonised way in the different countries, still respecting the different national implementations. The use of 112/E112 represents the first steps of this harmonised approach.

To address the interoperability and harmonisation dimensions of the eCall implementation, the following high-level objective was identified for the European pre-deployment pilots, coupled with supporting aims:

5.1.1 HeERO2 project objectives and supporting tasks.

<table>
<thead>
<tr>
<th>Obj. number</th>
<th>Description of Objective</th>
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<tbody>
<tr>
<td>Obj1</td>
<td>To extend HeERO to new Member States or associated countries to demonstrate the scalability of the HeERO solution and to widen the acceptance of eCall</td>
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<tr>
<th>Aim number</th>
<th>Description of Aim</th>
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<tbody>
<tr>
<td>Aim-1</td>
<td>To prepare the necessary infrastructure to realise pan-European “eCall”</td>
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<td>Aim-2</td>
<td>To boost Member States investment in the PSAP infrastructure and interoperability of the service within the Road Map (end of 2014)</td>
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<tr>
<td>Aim-3</td>
<td>A wider adoption across more Member States to test the proposed solution</td>
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Table 2 HeERO2 Objective and Supporting Aims

The HeERO2 project is specifically aimed at the member states who will be involved in achieving the necessary upgrade to member state upgrade to permit eCall based on 112 to
operate. In addition the experience and results from the HeERO1 and 2 projects are of significant interest to all relevant stakeholders in the eCall community, specifically vehicle makers, vehicle component manufacturers and mobile network operators. The project sought to address these groups during the lifetime of the project by utilising the HeERO2 associate partnership. This partnership was open to both member state and commercial enterprise, to permit the accredited parties to share first hand in the result of the project, and where necessary to encourage the testing of eCall equipment.

The specific tasks that allowed the pilot project to address the identified objective are listed below:

**Task 1: State-of-the-art analysis**

HeERO1 issued an exhaustive state-of-the-art analysis in the area of 112 response, which included E112 calls, followed then by eCall which identified all necessary system implementation steps with a focus on:

- in-vehicle system equipment interface;
- telecommunication infrastructure (specifically 112/E112 related parts);
- PSAP infrastructure.

This analysis issued the Hardware (HW) and Software (SW) set-ups needed at different HeERO1 pilot sites gathered the initial background information for the definition of steps leading towards the eCall standards implementation. On this basis, the eCall In Vehicle System, 112 and PSAP upgrades have been defined for HeERO1 member states. This information has now been transferred to HeERO2.

As far as the PSAP infrastructure is concerned, this analysis also helped understanding the technology upgrades needed in the different participating Member States in order to accommodate the eCall service within national/local specificities in terms of PSAP and Emergency Operations organisations.

All knowledge gained in HeERO1 was reused in HeERO2. It is also important to recognise at this stage the valuable information that was passed to the Associate Pilot Sites for HeERO as they seek to understand the complexity of their own PSAP architecture and then understand the necessary technical upgrades that will be required.

The possible deployment scenarios identified in Europe are:

1. **Centralised/decentralised organisation**

   - **centralised organisation**: all eCall emergency calls (MSD + voice) are routed to a central PSAP, whose operators will handle the emergency and contact the emergency services call centres or dispatch the emergency services if appropriate;
• de-centralised organisation: the eCall emergency call (MSD + voice) will reach the regional/local PSAP which is normally nearest to the place of the collision;
• combined organisation: in specific country areas the infrastructure will be centralised whereas in other areas it will be de-centralised

2. eCall and 112 calls handling by the PSAP

• Direct handling of eCall: the eCall will be received by the same PSAP that receives the 112 calls, although they may be received by specific operators specialised on handling eCall.
• Indirect handling of eCall: the eCall will be received by a different PSAP (specific 112 PSAP also used as eCall PSAP or private PSAP) that the one receiving the 112 calls in that area. This intermediate filtering PSAP will receive the eCall, evaluate the need of emergency assistance, and in case of real emergency it will transmit the call to the normal PSAP or directly to the emergency service, as appropriate.
• Mixed handling of eCall: several organisation can be envisaged:
  o Direct handling of automatic eCall (normally with a reduced percentage of false calls) and indirect handling of manual eCall (the eCall discriminator allows differentiation between automatically triggered eCall and manually triggered eCall).
  o In some regions/areas direct handling of eCall, whereas in other areas indirect handling of eCall.

The type of organisation to handle the eCall in HeERO2 differed from country to country, mainly depending on the Member States specific emergency service organisation, the attribution of competences at national/regional/local level, and the emergency response procedures, as well as on the technological equipment of the PSAP.

These different organisations needed to be carefully tested to guarantee the functionality and interoperability of the solutions to be deployed. In HeERO2, emphasis was put on the certification framework needed around the PSAP.

Finally, this state-of-the-art analysis also focused on the emergency operational upgrades that the eCall service will generate, to ensure the efficient handling of emergency situations generated by car collisions and notified via in-vehicle eCall systems.

All knowledge gained in HeERO1 was reused in HeERO2. The resources needed in this task were therefore substantially reduced as compared to HeERO1.

HeERO2 focused in the state-of –the Art analysis on the new topics:

• HGV handling;
• Support of dangerous goods transports;
• Support of P2W;
• Aftermarket device.
Activity 2: Implement and test the European eCall agreed standards

The most efficient way to address interoperability issues is to use the agreed common standards. The European Standardisation Bodies CEN and ETSI are working on eCall standards since 2004 and, as a result, the following technical and operational standards have been developed so far:

- CEN EN 15722: Intelligent transport systems - eSafety - eCall minimum set of data
- CEN EN 16062 - eCall- High Level Applications Protocols
- CEN EN 16072 - Pan European eCall Operating Requirements
- EN/ISO 24978 ITS Safety and emergency messages using any available wireless media - Data registry procedures
- ETSI TS 126 267: In-band modem solution, general description
- ETSI TS 124 008: Pan-European eCall discriminator

During HeERO1, a Standardisation Task Force was created to coordinate the interaction between the HeERO1 pilot sites, their constituencies and the European Standardisation Organisations. One of the roles of the Task Force was to gather the feedback from the pilot sites, to identify whether a refinement of the standard is needed, and if yes to take the necessary actions in a concerted manner.

HeERO2 pilots continued with this task with specialist assistance from CEN to formulate the required changes and place them before CEN or ETSI. This measure has been identified as a key element to ensure that the current timeline for the mandated introduction of Pan European eCall based on 112 is maintained. This activity was carried out in WP 6.

This was found to be of high value in the Belgian pilot site were a commercial intermediate PSAP was used to screen all eCall as a result, they identified that the EN16102 TPS eCall standard was the most appropriate standard to be used. However initial deployment identified areas of improvement to the standard, as like the published standards for eCall based on 112 in HeERO1, they had not been tested prior to publication

Activity 3: Implement and test identified infrastructure upgrades

As a result of Task 1 and Task 2 activities in HeERO1 and 2, a number of infrastructure technical and operational upgrades were implemented in the HeERO2 pilots prior to the pilot operation phase.

For the PSAPs side the following technical upgrades areas can be identified:

- Equipment of a server with an in-band modem able to receive the eCall and extract the MSD;
• Definition of the software for the decoding of the MSD, including the VIN decoder, which will allow the operator to extract the VIN information;

• Integration of the MSD data in the PSAP operational software, to show the eCall data in the PSAP operator screens (GIS and incident management screens) to allow an efficient handling of the emergency by the PSAP operator, including identification of the position and heading of the vehicle.

Following work by the European eCall Implementation Platform (EeIP) Task Force VIN, the solution advocated providing an interoperable VIN solution across Europe utilises EUCARIS, which is the EUropean CAR and driving license Information System. HeERO1 was engaged with EUCARIS, and the solution to provide VIN information for roaming vehicles has been deployed across a number of sites. HeERO2 continued with this activity, and extended it for heavy goods vehicles (HGV) and dangerous goods. This solution was developed in HeERO1 in the Netherlands test site. HeERO2 extended this at the Luxembourg test site.

EUCARIS continued to support HeERO2, but to a lesser degree as there was no additional funding made available to EUCARIS.

As for the operations’ upgrade, it is clear that the implementation of the new emergency service eCall will generate the necessity to develop specific emergency centres procedures to ensure handling the eCall in an efficient way. These procedural upgrades include:

• Operational procedures for handling eCall (including e.g. the case of no voice connection with vehicle occupants – silent calls)

• Design of training programmes for PSAP operators (including use of GIS, access and use of VIN decoder, receipt and handling of MSD)

• In case of intermediate (filtering) PSAP, procedures to transfer the call and data to the PSAP

• Procedures for cross-border handling of eCall.

As for the Mobile Network Operators, the focus is on the implementation of the eCall discriminator ("eCall flag") in their mobile switch centres (MSC) of their networks, which will differentiate between voice only 112 emergency calls from mobile phones and 112 eCall from vehicles, and also between "Manually initiated eCall" and "Automatic initiated eCall". This functionality will allow the MNOs to identify eCall and route the voice and the MSD to the most appropriate PSAP as defined by national governments and according to national arrangements.

The position communicated by the industry body for the mobile network operators (GSMA), is that they have re-affirmed the commitment to make the necessary modifications to the network to permit the implementation of the eCall flag on the mobile networks in all member

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2 VIN is a worldwide unique serial number used by the automotive industry to identify individual motor vehicles. It is included in the Minimum Set of Data received by the PSAPs. Therefore the PSAP operators should be able to extract the relevant information included in the VIN, such as vehicle brand, model, model year, and type of energy (when included) using a VIN decoder solution.
states by the end of 2014, to be ready for the mandated introduction of the Pan European eCall currently in 2015. Following developments this timescale no longer applies, however the eCall discriminator deployment date has not been revised.

The pan European mobile network operators at a strategic level tacitly support the work undertaken by HeERO1; however this does not always translate to cooperation at member state level.

GSMA have offered to maintain a communication channel for any difficulties experienced in either HeERO1 or 2. Lessons learned from HeERO1 have resulted in most new pilot sites engaging a MNO specifically for the HeERO2 project.

Concerning the in-vehicle side the upgrades include:

- the Electronic Control Unit (ECU),
- the Positioning system,
- the Communication system,
- the Human-Machine Interaction (HMI).

All of these elements have been addressed in HeERO1, and were continued in HeERO2.

**Activity 4: Implement and test identified value-added services**

eCall builds on technical components (satellite positioning, processing and communication capabilities), which provide the basis for other in-vehicle private or public applications. The HeERO2 pilot will implement and test following applications:

**Exchange of information with Road Operators to improve Traffic Management**

Several European studies have highlighted the opportunity for the public and private road operators to take advantages from the eCall system immediate reporting of incidents to improve or fine-tune their current services, or even to develop new services, in the vision of a more efficient incident and traffic management.

For these improvements to happen, fast transmission of the incident related information from the PSAP to the Traffic Management and Information Centres and the Road Operators need to be ensured.

HeERO1 demonstrated a number of different variations of the solutions identified by EeIP Task Force PSAP-RO. The work from HeERO1 was implemented and tested in some pilot sites of HeERO2.

**Additional commercial services**

The introduction of eCall should be based on the “open platform” concept, which is part of the ITS Action Plan and would enable “plug and play” integration of future new or upgraded applications.
The EeIP Task Force OPEN has investigated the possible positive business models based on the common use of the eCall platform by interested stakeholders. The report has been submitted. However the report has been superseded by advances in the deployment of Pan European eCall. What has been established is that the original configuration of the IVS is precluded from being utilized for the provision of additional services owing to restrictions in licence conditions from the developer. That being said, HeERO2 proposes innovation with the provision of eCall for Powered 2 Wheel large Goods Vehicles and retrofit devices.

Some test sites implemented and tested private telematics services, which use the eCall platform in order to understand how technical integration, can be achieved and how end users access these services.

The strong link between HeERO1 and 2 and the European eCall Implementation Platform (EeIP) and associated task forces ensured highly focused and informed information being fed from the EeIP to the HeERO projects.

**Activity 5: eCall pilots operations in real-life environments**

During this task more than 60 vehicles of different types, in addition to the current Class M1 and N1, were equipped with eCall in-vehicle subsystems and devices allowing:

1. the identification and qualification of an incident that should cause the triggering of an eCall (e.g., airbag modules), the triggering mechanism (automatic and manual), and the subsystems allowing the bundling of the MSD;
2. the provision of the accurate location of the vehicle including the direction of driving;
3. the setting up of the 112 voice call and forward the data (using the standardised protocols defined by ETSI, i.e., the in-band modem) through the mobile network operators to the most relevant PSAP.

These eCall-equipped vehicles drove **locally** in the different participating Member States and **internationally** between participating Member States, and Associated Pilot Sites. This operation phase happened in real-life situations and aimed at testing all implemented components, in particular in terms of interoperability. Following the annual review of HeERO1, it was recognised that there was a requirement to coordinate the interoperability activities across all pilot and associate pilot sites, this was continued in HeERO2.

The goal was to test all systems required for the operation of the pan-European eCall, namely the mobile network, the routing of the modem call, the answer of the eCall at the PSAP, the decoding of MSD and the dispatch of the call to the appropriate Emergency Service. Moreover, the full chain emergency management, involving emergency centres that dispatch the emergency vehicles (fire brigades, ambulances etc.) needed to be included. This test was extremely important as it allowed verifying whether the full set of eCall procedures and processes in the value chain work consistently and efficiently in the vision of reducing the emergency response time and therefore save life and/or reduce the collision
severity. These tests also confirmed the information level of MSD or identified new requirements for MSD.

**Activity 6: Pilots evaluation and final recommendations**

This crucial task dealt with collection and processing of pilots’ data and with provision of pilots results and elaboration of conclusions and **recommendations for future eCall deployment in Europe.**

The task focused on the different national pilots’ results and produced recommendations for the different participating Member States to be used for their future deployment activity. These activities were already taking place in HeERO1, the result being that the evaluation matrix developed in HeERO1 continued to be used as it has been evaluated and found to be fit for purpose. Of course the needs of each pilot site and Member State differed, and as such the task remained an important element of HeERO2.

As for HeERO1, the results of this task were disseminated through the European eCall Implementation Platform, and Task Force GUID who incorporated them into the “Pan-European Implementation Guidelines” document which indicates the different steps to be undertaken by every eCall stakeholder to implement the eCall service. The significance of this is that the combined information from both HeERO1 and 2 amount to a significant body of evidence which can be utilised by other MS, as the date for the mandated introduction for the Pan European eCall based on 112 draws closer.

**Activity 7: eCall certification needs**

eCall is a life-saving system and, as such, a system/service Certification process should exist. In the past years, the iMobility Forum Working Group “eCall Driving Group” (eCall DG) provided some draft guidelines for the eCall certification procedures, but this work has not been continued after the end of the eCall DG mandate.

The eCall certification processes built on the rules of vehicle type approval. The implementation of eCall certification was required both for the fixed installations of the car industry and for the aftermarket process. The pilots offered the opportunity to understand real certification and homologation needs for eCall systems and service related to the whole chain, from the in vehicle devices to the PSAP software and equipment. HeERO2 continued this work, and integrated the requirements for periodic test inspection (PTI) to ensure that eCall continues to function correctly for the lifetime of the vehicle. To this end HeERO utilized the input from EeIP Task Force PTI.

**Activity 8: Promote Pilot Good Practice**
HeERO2 project regularly reported its results to the European eCall Implementation Platform (EeIP). This ensured that all participating Member States, and especially those who could not be involved in the pilot for several reasons (budget constraints, not ready yet for pre-deployment, etc.), were regularly updated on the project progress and achievement.

In addition to this cooperation activity with the EeIP platform, HeERO2 organised one major international event to communicate to the Member States who were not members of the project consortium the pilot final results (including eCall Road Map) and recommendations for future implementation of the service. Initiatives in member states were undertaken to promote the forthcoming deployment of eCall as the timetable for deployment approaches. This was achieved in conjunction with EeIP task force CAMP.

For HeERO2 it was decided that the project should retain the same identity as HeERO1, and would indeed be administered by the coordinator ERTICO as on project for the first year. This ensured that there was no dilution of the HeERO brand; both projects used the same logo and website, thus ensuring that there was the widest possible level of information provided from the experience of 14 member states and 1 accession country.

![HeERO Logo](image)

**Figure 1 HeERO Logo**

In addition following representations from a number of member states, who had not been successful in joining the HeERO2 project, the Associate status was formulated, to ensure that the widest possible audience could be informed about eCall deployment. This involved both member states and commercial entity.
Scheme of the Marketplace

Figure 2 HeERO Associate Partner Market Place
Figure 3 HeERO1 and 2 Web Site
5.2 Pilot Activities in response to the objectives

The HeERO2 project includes National and International activities involving the following Member States and Associated Countries:

Belgium, Bulgaria, Denmark, Luxembourg, Spain, Turkey.

The next sections describe in more details the architecture chosen in each pilot site to respond to the objectives set in the project, and the tests that have been undertaken.

5.2.1 Belgium

Belgium started to prepare for eCall in 2010, with the establishment of a public-private working group the is working group:

- developed a consensus paper on the introduction of pan-European eCall in Belgium;
- initiated some first eCall demos as well as the development of a testing framework for eCall;
- gather the major stakeholders’ active in the eCall chain in Belgium;
- act as an open, wider consultation group for the Belgian site in the HeERO2 project.

In addition to this, the public bodies active in eCall in Belgium set-up a public consultation body, which developed a first policy document concerning eCall.

The testing was carried out in the Greater Brussels Area (including Leuven).

The work plan and timelines in the project, the full chain for pan-European eCall will be covered:

- In-vehicle systems (between 5 and 30 are foreseen) will generate a regular pan-European eCall;
- the eCall flag will be implemented and in-band modem will be supported by the mobile network operator
- the eCall message will be delivered to a filtering instance acting on behalf of the rescue authorities
- the eCall message will then be forwarded to the PSAP based in Leuven (that will act as the “most appropriate PSAP” for the tests)
- it will be investigated how the eCall information can be used as an enabler of third-party services, as well as an input for traffic management centres.
The Belgian test site will rely on existing and operational systems; there is already an operational database providing information about the car based on the car identification number. The pilot, will evaluate if the required information (VIN) for the eCall MSD can be derived from this source (or from the EUCARIS server) and what adjustment are required in addition to fulfil these requirements. It will also be analysed what process adjustments and technical upgrades are required to comply with the EU specifications, and what training needs exist (covering for instance the use of new interfaces, the VIN decoder, digital map systems,).

Finally, the Belgian eCall pilot will contribute to the investigation of how certification and compliance testing can practically be organised and applied (with a focus on certification allowing the outsourcing of the filtering function, as well as tests in the context of automobile inspections).

During the project the Belgium Pilot Site was the only site to employ an intermediate PSAP. The purpose of this was to receive all incoming eCall (Both 112 and possibly TPS eCall) screen them and only when verified to pass them to the PSAP. To ensure that this process was handled correctly the pilot site employed the published TPS eCall Standard, EN16102 that provides the technical specification for the transfer of data between a TPS eCall provider and the PSAP.

Belgium also suffered with the quality and number of IVS provided for test purposes, this was in part due to the one consortium partner leaving the project (IVS provider). But also the quality of the IVS provided to the pilot sites overall. None were pre-production, all were experimental, and as a result the quality and consistency of the devices could not be assured.

Belgium achieved the deployment of the eCall flag across the Mobistar network.

5.2.1.1 Test Description
The testing conducted in Belgium was centred on the provision of the intermediate PSAP. This in itself caused difficulties as this had not been tried before and required additional
technical resource to solve integration issues, the site was also hampered by the lack of quality IVS, (This applied across most of the Pilot Sites and is an issue outside of the control of the project.

5.2.1.2 Conclusions,

Although there are technical issues and many of the tests could not be executed as planned, it is not to be expected that technical issues will be the obstacles for rolling out eCall in Belgium.

![Figure 5Belgium eCall Pilot Architecture](image)

5.2.2 Bulgaria

Bulgaria is fortunate to have one of the most advanced PSAP systems in Europe. In joining the HeERO2 project the pilot site undertook that the eCall service would be based on European approved standards.

The entire pilot service eCall chain will be implemented according to the available at present EU standards.

During the pilot a Bulgarian mobile operator will do the software implementation of the eCall flag via purchase/upgrade of a Mobile Switching Centre (MSC).

The Mobile operator will implement the standards for eCall discriminator (eCall flag) to distinguish between a regular E112 call and eCall.

IVS prototype will be developed, which will be installed in test vehicles. It will use different type of sensors and at least 3 geo positioning systems, with different algorithms for crash detection will be analysed. The development of IVS could help in cross boarder interoperability testing with the partners from HeERO1 and HeERO2 projects.
The MSD message will be transferred using technology specified in EU standard. The PSAP receiving the eCall will decode the MSD, format and insert it into the system 112. Then the case will be processed as regular one, i.e. transmitted to the district PSAP corresponding to the caller localization and visualized to the operator on the pilot/test workstations. After evaluation the need of emergency assistance, and in case of real emergency, it will transmit the call to the Dispatcher Centre for handling the emergency. In addition, within the Sofia PSAP a common decoder of the Vehicle Identification Number (VIN) included in the Minimum Set of Data (MSD) will be designed, developed and tested to be able to extract the necessary information (i.e., vehicle model, type, model year). The VIN decoder will have an interface for data synchronization with external VIN database, which interface and external database should be pointed out by Ministry of Interior of Bulgaria.

The Public Safety Answering Points which will receive the eCall emergency calls may have to undertake a series of technical and procedural upgrades to enable the correct handling of the eCall emergencies.

![Figure 6 112 Architecture Bulgaria](image)

During the project the pilot site focused on the correct provision of eCall based on 112, which required the provision of the eCall flag to ensure that the eCall was directed to the correct PSAP to handle the eCall. This was achieved and the eCall flag was also implemented. Prior to the commencement of the project, the Bulgarian government challenged the industry in Bulgaria to develop IVS suitable of the aftermarket, as the supply of new cars in both Romania (HeERO1) and Bulgaria is slower than in other parts of the European Union. This was achieved and Bulgaria now have 2 IVS which have been demonstrated to at the very least match the capabilities of the manufactured IVS and in many cases pass their capabilities.
Bulgaria experienced delays at the start of the project this was due to procurement issues, which were similar to those, experienced by the Czech Republic in HeERO1. However once resolved the pilot site moved quickly to normalise the timescale in project plan.

5.2.2.1 Test Description

The testing scenario developed for Bulgaria revolved around the deployment of the eCall flag to correctly identify incoming eCall and direct them to the correct PSAP. This was achieved. Bulgaria can now be described as compliant in terms of the deployment of the eCall flag, as the mobile network operator has enabled this enhancement over Bulgaria. All tested detailed were completed satisfactorily.

![Bulgarian pilot site architecture](image)

**Figure 7** Bulgarian pilot site architecture

The IVS devices used in all test sessions were designed and developed by two independent manufacturers (TUS and ICOM), but perform in a very similar way and the KPIs measured with them differ only in acceptable ranges. This meant that in addition to the successful interoperability tests during the project, PSAP implementation did not have problem communicating with different brands of IVS equipment though both the IVS devices and the PSAP are still in a pilot implementation stage.

One Bulgarian MNO – Mobiltel, implements the eCall flag. The other two national MNOs are already conducting tests in test environments. This will ensure complete coverage of Bulgaria.

5.2.2.2 Conclusions

During testing the Pilot Site discovered inconsistencies in the operation of IVS and the provision of the MSD. One functionality is the provision of a revised MSD on command from
the PSAP, however it was noted that not all IVS had the capability to provide refreshed data as opposed to a resend of the existing data.

In addition it was found that there was an inconsistency in the provision of direction travelled which is one of the important elements of the location data, it was found that the direction travelled was not sampled at the right time in the process and as a result the MSD detected an inconsistency stating “Position Cannot be trusted” where in fact the location provided was correct. This needs to be addressed.

5.2.3 Denmark

The Danish pilot site extend across all of Denmark, the original plan described in the description of work was for the support of the Danish Police who operate the two PSAP that handle all 112 in Denmark with the exception of Copenhagen, which is operated by the Copenhagen Municipality for the Copenhagen metropolitan.

However early on in the project the Police discovered that the single supplier for the two PSAP operated by the Danish Police were charging very high sums for the upgrade. This was unacceptable and as a result the Police withdrew from the project. The Danish Fire Service who completed all of the tasks in the description of work for no contribution, and ensured that Denmark was able to fulfil its obligations to the project took their place.

A small fleet of vehicles owned by the Danish Transport Authority were fitted with dormant mode eCall IVS and the demonstration phase ensured that collision data (MSD) came through to the PSAP in Copenhagen.
The Danish pilot site stated from the very start that they wished to examine the effect of what was termed (Dormant SIM IVS) this is in fact the wrong terminology, it is the device that this dormant, not the SIM.

This did cause difficulty as currently there is only one IVS supplier who is able to provide this equipment (Fujitsu10 HeERO2 Associate Partner). Nevertheless this did add real value to the test to see this type of equipment is use. This will be the type of IVS that could be fitted to eCall-equipped vehicles from 2018.
5.2.3.1 Test Description

Once the deviation from the original description of work had been resolved the pilot team moved to remain faithful to the original concept of testing with one PSAP rather than the two that were planned.

The testing that was carried out included the dormant IVS, the result were of high value as these were the only tests carried out in the entire project which replicated the characteristics of the IVS as they are intended to be installed on new vehicles from 2018.

5.2.3.2 Conclusions

Operator perspective:

Audio quality is a real issue. Static occurs for all equipment, making it difficult for the operator to communicate with the driver.

The visual implementation on screen is perfect. (MSD)

Impressed with the accuracy of the system – this will make a difference.

Resend of MSD only takes five seconds – this is positive, as it increases trust in the position.

IVS Operation

The IVS unit transmits the "Heading" of the vehicle post crash; it should send the heading pre crash.

This error was located due to a poor interpretation of the standards and can be rectified.

Figure 10 Danish system architecture

The eCall system defined for Denmark works. Even with prototypes and all the problems that followed. The PSAP operators in the pilot-test recognised the value of eCall.
There is a need to have better retrofit IVS-units in the market. This is due to the fact Denmark is the largest market in Europe for the supply of the low end specified vehicles. This is due to the vehicle tax situation in Denmark.

### 5.2.4 Luxembourg

Luxembourg developed a fully functional eCall service that was implemented into the existing 112 system.

As Luxembourg is a small country, with a high volume of transit traffic, the local eCall service must be based on European standards. This will enable any vehicle, from any European country, travelling through Luxembourg, and having the correct, standard devices, to obtain support from the Luxembourg public 112 services.

Luxembourg was mandated to implement pan European eCall for 2015, as part of the HeERO2 project.

The Luxembourg project partner EPT will implement the mechanism that differentiates eCall from normal emergency 112 calls, using the eCall discriminator flag, into its switches. The implementation of the eCall Flag was planned for mid-2014.

Luxembourg has a single 112 centre (PSAP) that is responsible for all emergency calls in the country.

The 112 centre is located in the city of Luxembourg. The Luxembourg Administration des Services de Secours (ASS) is responsible for the operation of the 112 centre. As the ASS plans to build a complete new 112 centre in the next 5 years, investment in the existing centre has to be kept to a minimum.

The Luxembourg partners have decided therefore to leverage the concept developed in HeERO1 German Pilot Site the OECON eCall Router.

The eCall Router separates the eCall voice channel from the eCall data. The eCall voice channel is routed to a dedicated 112 operator. For the pilot phase this is a fixed location in the 112 centre; in the operational phase this can be extended depending on the demand and traffic. The eCall data is routed to an eCall Server.

This eCall server analyses the eCall data containing the minimum set of data – (MSD). The eCall server provides the following functionality:

- it determines the location of the caller, and show this via a GIS module;
- If the caller’s location is outside the boundaries of Luxembourg the eCall is routed to the appropriate eCall service in the Home country where the caller is registered (Cross-border handling);
• It determines information about the type of vehicle;
• The eCall server checks with the Dangerous Goods tracking service whether the vehicle is a dangerous goods transporter and whether it is registered with the service. If this is the case, the type of dangerous good carried by the transporter and handling information will be provided (Dangerous goods handling).

Luxembourg developed, implement and tested eCall handling procedures for the 112 operators. These procedures were integrated into the standard PSAP workflow.

Special attention was given to the handling of dangerous goods transports and the integration of transporters.

The interface between the eCall server and the DG-Trac service was based on standards developed by CEN TC 278 WG 15. Providing feedback to the standardisation bodies will be provided if necessary.\(^3\)

The concept was originally developed in HeERO1 Dutch Pilot Site, and is being developed with the active support of CEN 278 WG15.

Many vehicles that drive close to the borders, but inside Luxembourg, will automatically be connected to German, French or Belgian mobile operators, irrespective of exactly where they are located in Luxembourg. The routing of the call to the Luxembourg 112 centre is important the call should be routed correctly not to the German, French or Belgium PSAP.

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\(^3\) DG Trac is the Dangerous Goods Tracking, the project addresses the tracking and tracing of dangerous goods in the medical sector integrating and using existing space technologies (navigational services, communication services) with GSM/UMTS and Internet.

The main issue with the dangerous goods transports in the medical sector is that they are often not carried out according to the legal requirements. DG-Trac allows the tracking and tracing of these goods and introduces a centralised mechanism for the management and (controlled) distribution of information concerning each transport.

Thanks to the European eCall, in case of an accident, the emergency service will automatically be alerted and informed about the involved dangerous goods and how to handle them.
5.2.4.1 Test Description

The testing carried out in Luxembourg was within that described in the description of work. The pilot site did suffer a minimal deviation in work caused by the withdrawal of a Belgium partner who was due to provide IVS for the pilot site. Luxembourg like Belgium took advantage of the HeERO2 Associate partnership for the provision of IVS. This Coordinator led activity enabled, the GENEVA Micro developers to provide IVS to both Luxembourg and Belgium.

As stated above the pilot site is due to receive a new PSAP system this year (2015). To participate in the project the OECOn eCall router server was utilised. This unit performed as anticipated.
5.2.4.2 Recommendations and Conclusions

Recommendations:

- Voice channel blocking time and MSD transmission times are too high for both IVS. The new version of the FICOSA SW reduces the time, but it is still too long. The problem seems to be in the synchronisation of the IVS and the PSAP modem. We recommend reviewing the synchronisation process to reduce this time.

- The heading information does not provide the direction of travel as intended in all implementations. The FUJITSU and the FICOSA units provided the heading information from the current location of the car when the eCall was triggered. If the car had turned around during the accident this is no longer the direction of travel. The last three positions in the MSD should be used to determine the direction of travel only. The PSAP SW needs to show the last three positions on the map in addition to the last location.

- When an IVS is triggered to retransmit the MSD, the IVS provides updated content of the MSD at the moment of request for retransmission. As the MSD containing the updated position provides valuable information to PSAPs in case of a retransmission of the MSD (especially for identifying false alarms), the content should always be updated.

Luxembourg project partner POST Luxembourg particularly recommends that MNOs planning on testing the eCall switch firstly check that the correct software is installed that will allow the subsequent routing of the calls through Bits 6 and 7. Investigations with other MNO partners in the HeERO2 project this has been shown to be a relatively common problem and the responses of the MSC software suppliers can vary greatly as to availability and pricing.
This is a significant issue and should be borne in mind when planning the timing of the PSAP upgrade.

**Conclusion**

The success rates of completed calls and received MSD could be improved in comparison with the results of Phase 1 testing. As such the modifications to the published standard has been validated. This is now awaiting verification in the ballot procedure with CEN.

The IVS are still prototypes and so there are problems with stability, which should be solved when the final overall introduction of eCall gets closer.

The biggest problem is the success rate of the MSD transmission and the long voice channel blocking time that needs to be improved.

The testing proved valuable where it revealed problems that were not necessarily anticipated to be problems specifically the Bit routing software’s importance to the success of the call transmission for many partners.

### 5.2.5 Spain

Spain implemented the Pan European eCall service into the existing regional E112 system using an intermediate PSAP, which allowed the filtering and discrimination of eCall.

This is a process that was also trialled in Belgium, and Turkey also has a version. The difference in Spain was the complexity of the existing PSAP architecture, and the fact that the screening PSAP was provided by the state, and is also the Traffic Management Centre for the highways of Spain.

The eCall service is based on European approved standards. Moreover Spain has already transposed the ITS Directive 2010/40, which includes the eCall. The transposition was published in the Spanish Official Journal on the 14th April 2012.

The Spanish pilot is the basis for the full coverage of the eCall service in Spain; therefore, it was important objective to use the HeERO2 pilot experience to correctly prepare Spain to achieve full coverage of the country.

The Spanish pilot architecture is based on a several layer approach. It has been agreed with the Spanish Commission on Civil Protection. The first level will be an intermediate PSAP deployed by the DGT in Madrid which will be in charge of filtering the received eCall, decoding the received MSD and sending the information to the appropriate regional 112 PSAP, also redirecting the voice call when necessary.

At the DGT intermediate PSAP, after MSD decoding, the information received will be provided to three parties:
Regional 112 PSAP where previous upgrading and system integration of the eCall system and the E112 already running system will be done.

- TCC/TIC in own DGT intermediate PSAP where the information will be related with the following own DGT databases:
  - Spanish database of the Vehicle Identification Number (VIN);
  - Spanish database of traffic incidents (ARENA);
  - Additionally, other databases providing necessary information such as RACC-owned database of Rescue Sheets by VIN;

- Traffic Police.

Information received at the intermediate PSAP will be related to M1 and N1 category equipped vehicles but some activities will also be dealing with a quick attention to motorcycles collisions (Powered 2 Wheels vehicles, P2W). For P2W, sensor assessment in helmets and other equipment (GPS, accelerometer, gyroscope, odometer, inclinometer, fall detection) together with solutions linked to the P2W vehicle itself will be carried out. Tests of incidents in motorcycle races will be taken into account for this purpose. In addition to in-laboratory tests to fine-tune the systems used in the P2W pilot, tests will be carried out in real-life scenarios, in particular in races.

Spain has 19 regional 112 emergency centres belonging to Civil Protection. 4 of them participated in the Spanish pilot. All of them have different hardware and software equipment for E112 calls emergency management. Giving coverage to 4 pilot areas ensured both enough sampling of current existing 112 emergency handling centres and assessment and experience (operating procedures and discrimination of eCall) on what happens in the border area between different 112 emergency centres.

Mobile Networks did not participate in the trial owing to the complexity of the intermediate PSAP and the 112 architecture.

Automobile Club associations had an important role in the Spanish pilot by providing user requirements, assessment and dissemination of information and best practice related to the pilot and to eCall in the whole country.

In parallel the vulnerability of antennas and use of integrated antennas in the pilot vehicles were evaluated in order to avoid silent eCall or to have more information of what happens in case of incidents with all the telecommunication equipment on-board. The results of this activity have been shared with EeIP task force Silent.
5.2.5.1 Test Description

The testing undertaken in Spain focused on a number of different areas:
The optimization of the intermediate PSAP concept, this included the inclusion of the traffic management system, this was achieved, and permitted the reception of both the voice and data to be decoded and then transferred to the correct level 1 PSAP in the correct region.
The second area of interest was the first provision of the eCall for Powered 2 Wheeled Vehicles (P2W).
5.2.5.2 Recommendations and Conclusion

Recommendations

GPS positioning is not accurate enough. This should be improved.

The answering protocol should establish a fixed period for the voice communication to better assess the incoming call.

Voice channel blocking times should be minimized and also a sound could be reproduced while the channel is blocked to avoid transmission noise.

In many situations the vehicle heading information does not show correctly the direction of travel and in some cases only the direction of the vehicle when the eCall was triggered is not enough. MSD could provide previous information about the two or three last positions to determine the travel direction perfectly.

In case of an MSD request (once the voice channel is open and a previous MSD has been received at the PSAP) instead of sending the same MSD Data, the best option in this case would be updating all the MSD information with location, heading, etc. This could be useful in case the vehicle has moved due to the impact and this is also a way to identify false alarms.

Conclusions

Galicia/Catilla y Leon

Special mention should be made to cross regional tests performed in Castilla y Leon. PSAP was able to correctly redirect the eCall from IVS to Galicia PSAP or Castilla y León PSAP taking into account the GPS position of the IVS.

All eCall tests in Galicia were carried out dialling to a long number (without eCall Flag) given that the MNO has not implemented the changes necessary in the network to support it. Nevertheless CTAG has tested in laboratory the compatibility of its IVS with eCall flag.
Madrid

The success rates of completed calls and received MSD in PSAP show an improvement with respect to the results in the fine-tuning between phases different modifications were incorporated in order to adapt to the upgrading of standards.

The IVS are still prototypes and for this reason, minor problems with stability, sound, etc. have been observed. These will be solved when going to a commercial phase.

A great number of cross-regional tests were carried out between Madrid and Castilla y León and in all the tests the intermediate PSAP at DGT was able to redirect eCall to the correct regional 112 PSAP based on the IVS’s reported position. The performance of the system in this scenario was similar to other scenarios.

The eCall flag has not been implemented by the MNO; therefore, no calls to the emergency number 112 have been tested. Laboratory tests have been performed with a test version of the network implementing the eCall with Vodafone and results are satisfactory.

The advent of the P2W eCall in Spain was of significant development for eCall. The study found that there was still more work to be carried out which involves the additional research to understand what a crash for P2W will look like and which ones should trigger an eCall. This work was very challenging and as a direct result of the work undertaken in HeERO2 the motorcycle industry have now joined the I.HeERO proposal (The next step in eCall deployment) to define line fit eCall for P2W, this was a voluntary decision, having now seen the value of the proposed eCall.

5.2.6 Turkey

Turkey implemented and integrated eCall service into the existing 112 PSAP in Antalya. The existing PSAP and the planned eCall PSAP operated without affecting each other.

Any type of vehicle travelling through Antalya equipped with an IVS; will be able to get the support from this eCall service.

Turkish automotive industry’s two leading automotive manufacturers Tofas (TOF) and Oyak Renault (OYRE) acted as subcontractors of the Turkish Ministry of Interior (MOITR). OYRE and TOF provided the eCall telematic devices implementing the eCall in-band modem standardised by ETSI. Tofas were supported by CRF, Italian partner of the HeERO1 project, in the definition of the solutions including M1 and N1 vehicle types with retrofit solutions and OEM installed solutions and geo-referencing solutions. This permitted the CRF outcomes of the HeERO1 pilot project to be exploited in the Turkish pilot site.
5.2.6.1 Test Description

All test described in the description of work were carried out in the Turkish pilot site. The technical development at the PSAP in fact resulted in another version of the intermediate PSAP being available, as the call was received in the PSAP, but not released into the PSAP environment until verified. This is an extremely cost effective solution, to prevent the PSAP being overwhelmed by false or inappropriate calls.

The model deployed in Antalya means that the Antalya PSAP can deal with all eCall in Turkey if necessary.

Turkcell achieved the implementation of the eCall flag across the entire province of Antalya.
5.3 Main Results

5.3.1 Pilot Site performance

The performance of each site was evaluated in work package 4 all result for each pilot site have been drawn together and are reproduced in HeERO2 Work Package 4 Final Results. The object of this deliverable was to present the final test results from all pilot sites in a comprehensible and consistent manner to allow the provision of conclusions and recommendations as a result of the HeERO2 project.

The intent of the HeERO2 pilot sites has been mainly to evaluate if the requested performance of the eCall service can be met with a deployment of the approved European eCall standards in the existing public mobile telecommunications networks and within the existing 112 system. This means that the testing has had a strong focus on the eCall standards and capturing the key performance indicators, the KPIs. Other issues, such as the response time of the rescue services and ambulances, use of EUCARIS and use of VIN in the operational rescue chain, as well as non-operational issues, like legal liability, privacy issues, periodic time inspections, change of a car ownership, etc. is not included in the work of the HeERO2 pilot sites.

The outcome of the tests performed and reported in this document confirm that the pan-European eCall is working according to expectations however there is still room for improvement both in European standards and in the implementation by the suppliers.

5.3.1.1 KPI Results

The HeERO2 sites tested the key KPI across nearly all pilot sites (KPI 1 to KPI 8) Below is the representation of the tests carried out in each pilot site.
Figure 20 KPI tested across all Pilot Sites

As in the final report for HeERO1 the key metrics are the presentation of the MSD in the PSAP, and the voice channel blocking time.
KPI 05: Duration until MSD is presented in PSAP

Figure 21 KPI 05 MSD presentation time

Figure 22 KPI 007 Voice Channel Blocking
5.3.1.2 **Recommendations from evaluation.**

The recommendations produced are the headlines obtained from the synthesis of the evaluation work package. For full details please refer to the deliverables pertaining to this work package.

**General Recommendations**

- The heading information is to be given to the PSAP as required by EN 16072. The manufacturers have to be made aware of these requirements.
- When re-transmitting the MSD the IVS should update the MSD content according to EN16072.
- For type approval a performance requirement for audio should be defined and evaluated by the technical services.
- Voice channel blocking time and MSD transmission times have to be as short as possible and be in line with the defined thresholds for these KPIs. Vehicle manufacturers shall implement best practice to minimize voice channel blocking time.
- In order to roll-out the use of filtering instances, procedures, guidelines, criteria and rules are to be set up to provide the long numbers of PSAPs to filtering instances. It is however recommended to do steps forward in setting up this certification framework together with the definition of the conformity assessment for PSAPs.
- Cross border communication between adjacent member states is an important requirement for successful deployment of eCall. Today, emergency services between different member states in Europe are not interconnected for data exchange. A further study should evaluate data integration concepts in more detail.
Looking to the next generation of emergency calls, there the use of in-band modem technology is to be replaced.

**Performance Recommendations**

- KPIs in WP4 developed to measure the performance of the components and processes
- Based on the results: recommendations for target values were developed
  - These target values were defined only for those critical values which are measured during drive tests on roads
  - Many of these KPIs measure the critical spans of time, influenced by the respective implementation of the IVS and/or PSAP suppliers.
  - Other KPIs measure the accuracy of the GNSS or the correctness of the heading information.
  - For the following KPIs the thresholds are specified directly.
    - KPI05, the time for MSD presentation shall be around 8 seconds based on KPI07 plus average call establishment time of 3.5 to 4 seconds for a normal call, as such about 3 seconds for emergency set up
    - KPI07, the voice blocking time should be as specified by the ETSI TS 126 269 around 4 seconds
    - KPI09, the accuracy of position shall reach the typical GNSS accuracy of 3 to 5m. In addition there shall be requirements for signal strength and how much loss of signal is allowed.
  - For KPI13 the test criterion shall be to measure the travel direction not the direction of the vehicle to be able to identify the right lane of the highway with physical separation

**Conclusions**

eCall is performing as expected, however the lack of production quality IVS is a real issue. The most significant feature is the omission of the Mobile Networks who are yet to implement the necessary upgrade to the networks. This failure has an adverse impact on the performance of the system itself.

**5.3.2 Deliverables**

The project has been assessed by independent technical review of the lifetime of the project to have achieved all of its objectives. One of the key metrics for this is the submission and acceptance of deliverables. These documents have been a key part in articulating the progress of each pilot site.
Below does the HeERO2 consortium produce a table of all publicly available deliverables during the project.

The deliverables are broken down into the relevant work package areas of activity each work package and deliverable is given a short description:

**Work Package 2 Implementation**

The main objective of WP 2 is to ensure the successful implementation of the eCall service in the pilot test site

*HeERO2_WP2_DEL_D2_1_Functional and operational requirements_v2.0*

Current state-of-the-art analysis in the area of 112 resp. E112 calls has been undertaken to build up the reference document for identification of the functional and operational requirements, HW installation and SW implementation needs in each HeERO2 project member state

*HeERO2_WP2_DEL_D2_2_Functional specification_final*

This document focuses on functional architecture and specification of all parts of the future public eCall service chain, which means the in-vehicle system equipment, telecommunication infrastructure (specifically 112/E112 related parts) and PSAP infrastructure for each pilot country.

Implementation of eCall service has to fulfil requirements for interoperable eCall system as is described in Deliverable D2.1 and as is one of the main goals of HeERO2 project. It is responsibility of each member state to prepare their implementation with respect to all required standards as is described in D2.1 and also in Annex 1 of this document.

*HeERO2_WP2_DEL_D2_3_HW_SW_implementation_v1.0*

This deliverable describes the work plan for WP2.3, where the outputs of the WP2.1 and WP2.2 are mirrored into the physical HW installation and SW implementation processes, according to the specific project objectives the main activities are listed down as follows:

**HW installation:**

- OBU and after-market devices installation into the fleet of vehicles
- Relevant PSAP upgrades of HW equipment (servers, screens, etc.)
- HW upgrades related to the integration of eCall services with the other ITS applications

**SW implementation:**

- IVE – PSAP communication link set up (implementation of the in-band modem)
- PSAP terminal SW upgrades - MSD data visualization
- PSAP terminal SW upgrades – VIN decoder
- eCall discriminator implementation at the MNO Mobile Switching Centres (MSC)
- Interface with the Traffic Management Information Centre implementation
- SW upgrades related to the integration of eCall services with the other ITS applications
- implementation of EUCARIS interface

This document contains an introductory part, where the philosophy of test scenarios is described together with requirements of standards. These scenarios are generally similar for all member states. Basic set of testing scenarios has been prepared during preparation is documented in chapter 3.3. A few countries will use it as a reference, other countries will use it only partly as they have prepared their own set of tests as described further in Annex A which is included in the document.

Main goal of this document is to provide guidance in the preparation of a manual for the receipt of eCall by PSAP operator’s training during the HeERO2 project.

Purpose of this document is to describe the test scenarios of additional functionality or system improvement developed during the second phase of WP2.3 HW Installation and SW Implementation. These Member state related scenarios are included as Annex A.

**Work Package 3 Operation**

**The main objectives of WP 3 were:**

- Prepare the eCall operations phase mainly through the training of the dispatchers and the updates in the operating manuals for each of the emergency services involved.
- Run the eCall pilot in the different member and associated States and cross border from the operational view
  - PSAP technical upgrade made in WP 2
  - PSAP organisation structure to ensure the proper handling of the eCall
  - Pan European solution key points
    - IVE interface
    - eCall discriminator (eCall Flag)
    - VIN decoder
    - Traffic Management Centre interfaces
TPS system interface
  o Inter-operable services

HeERO2_WP3_DEL_D3.1-Pilot operation preparation report

The purpose of this document is to highlight the operational aspects of the eCall pilots implemented in all the member states participating in HeERO2. The document provides a first draft of each member state’s operational flowchart.

During the two operational phases of the project, the content of the document will be modified according to the results of the tests and will be presented in the next deliverable. The operational workflows illustrate the different approaches of the different Member States whilst aiming for the same goal: offering a pan-European eCall service based on 112.

HeERO2_WP3_DEL_D3.2-Operation preliminary results

This document contains the eCall workflows for each pilot site

HeERO2_WP3_D3.3_Final Operational Results

The purpose of the D3.3 deliverable is to describe the second operational phase of the pan-European eCall pilot systems and to provide the test results obtained by each Member State Pilot Site at the end of the Second Operation Phase of the HeERO2 Project

Work Package 4 Evaluation

The main objectives of WP 4 are:

The main objective of this WP was to ensure a common and effective Evaluation of the data gathered on the different Pilot Sites and provide the results of the pilots in a comparable way across all participating Members and Associated States.

HeERO2_WP4_DEL_D4.1 Agreed KPI

The purpose of this document was to define a common base to allow the evaluation of the achieved results of all participating member states. This document provided the basis for discussions and consolidation. Thus the document describes the Key Performance Indicators (KPIs) required to evaluate the performances of the different eCall implementations of the Member States in a comparable way.

HeERO2_WP4_DEL_D4.3 Draft Results of the Tests

This document presented the test results from the various pilot sites. In addition, this document presented the preliminary results of the eCall service. This document provided a first overview of the Key Performance Indicators (KPIs) as measured in the different eCall implementations at the pilot sites.
**HeERO2_WP4_DEL_D4.3 Final results**

The purpose of this document was to present the final test results from all pilot sites in a comprehensible and consistent manner, and to allow the provision of conclusions and recommendations from the HeERO2 project. The overall evaluation was based on the results of the pilot sites (Belgium, Bulgaria, Denmark Luxembourg Spain and Turkey). Each pilot site was requested to provide statistical evaluations of the measured KPIs, recommendations and conclusions.

**Work Package 5 Dissemination**

The main objective of WP 5 was:

- To disseminate information about the project, its objectives, and results
- To enhance the awareness about eCall and solutions resulting from the project amongst the target groups (emergency services and public authorities, political representatives, industry)
- To share the pilot pre-deployment experience with the Member and Associated States that were not participating in the project, but expressed interest in be involved as “Observers”
- To facilitate information and experience exchange within the project: and to carry out dissemination activities, collect and collate results and outcomes in participant countries

**HeERO2_WP5_D5.2_HeERO2 Website**

This website was maintained for both HeERO2 1 and for HeERO2

**HeERO2_WP5_D5.3_HeERO2 Flyer**

This dissemination document applies to both HeERO1 and 2 and was revised to increase public understanding of eCall.

**HeERO2_WP5_D5.4_HeERO2 Site Compendium**

Purpose of this document was to describe the architecture of each pilot site on the path to eCall deployment.

**HeERO2_WP5_D5.5_HeERO2 Newsletter Issue 1**

This document was a compilation of pilot site activity over the past year.

**HeERO2_WP5_D5.5_HeERO2 Newsletter Issue 2**

This document was a compilation of pilot site activity over the past year.
Work Package 6 Deployment Enablers

The overall aim of WP6 was the analysis of eCall enablers and barriers and the description and/or planning of the certification processes in Member and Associated States.

Many studies on eCall created a good basis for the work. Enablers/barriers exist e.g. in legal framework, organisational issues, technology, privacy, security, economy and ethical issues.

The specific objectives were:

- Collection of deployment barriers already identified by HeERO 1, verification of the impact of those barriers in the HeERO2 pilots, identification of the new barriers in the HeERO2 pilots. The deployment barriers identified for the eCall at specific local level and common to all countries, will also consider the evolution of the ITS and ICT services (e.g. HGV eCall, dangerous goods monitoring, Powered 2 Wheels Retrofit). The identification of solutions is an important part of this objective.
- Identification of new enablers relevant to industrial partners, authorities and to end-users related to the evolution and Road Maps of the technological scenario (e.g. 4G/LTE Long Term Evolution);
- Refinement of the needs for certification and recommendations for the certification of the eCall process, which was started in HeERO 1 with the chain elements on the basis of the experiences, gained during the pilot deployments.
- Analysis of the expected impacts of the new scenarios opened by the experience gathered in the existing and new pilots to be deployed towards the standardisation bodies which have direct and indirect influence in the eCall domain (e.g. Heavy Goods Vehicle, Dangerous Goods, Powered Two Wheelers, Continuity of services Cross-border, and Retro-fit devices).
- Refinement, update and improvement of the eCall Deployment Road Map;
- Following the same restructuring of the eCall Deployment Road Map, production of recommendations for the eCall implementation and operation in European Member States and beyond;
- Ensuring the continuity and optimisation of services in crossing boundaries and crossing regions. This is a coordinating function drawing on experience from HeERO 1. This function will detail the interoperability for each pilot site from a global project perspective.

HeERO2_D6.1 Deployment Barriers and Enablers

The purpose of this document was to build up a reference for the barriers and enablers to eCall implementation in HeERO2 Member States; the document is a continuation of the HeERO 1 deliverable. The aim is to provide an overview of the aspects that could facilitate or slow down the deployment of eCall services at country and European level. Specifically, barriers and enablers in the HeERO2 Pilot Sites are identified as well as the ones referred to the new emerging topics of HeERO2: geo-referencing, Power Two Wheelers, retrofit devices, HGV and vehicles carrying dangerous goods.
The aim of this document was to build up an updated reference for the eCall enablers, opportunities and challenges in HeERO2 Member States. In line with the activities of HeERO1, the results of this report will be used as an input to the Guidelines for eCall Implementation and Operations.

**HeERO2_WP6_D6_3_Needs for eCall certification_V1.0**

This deliverable intends to propose technical procedures and provide roadmaps for the implementation of the eCall certification. The document is therefore collecting views from HeERO2 partners and beyond, concerning the certification needs. For the purpose of this deliverable, certification is understood as a voluntary industry framework to validate devices.

**HeERO2_D6.4-eCall Standardisation**

The purpose of this document was to explain the HeERO strategy to analyse the eCall deployment as carried out in the HeERO piloting activities with the goal to identify the impact towards the standardisation, in order for instance to refine or update the base standards. This deliverable will also provide a description of the HeERO activities, which contributed to the deployment impact toward the standardisation. Actually these activities have been mainly carried as part of the HeERO standardisation task force.

**HeERO2_WP6_DEL_D6 5-Recommendations on implementation road map for eCall**

The aim was to provide guidelines for the eCall implementation that are the result of the continuity, interrelation and integration of the activities carried out during the two project phases and to include aspects related to the new emerging topics (Truck, PTW and retrofit devices), which are part of the focus of HeERO2, along with GNSS issues and to address the identified shortfalls of eCall.

**HeERO2_WP6.6_Recommendations on implementation and operation in advanced technological scenarios**

The objective of the report was to provide a set of recommendations for the implementation and operation of eCall in Europe. The document will follow the structure developed in HeERO 1 for the planning, design and implementation of eCall, it will integrate and update the recommendations and it will contribute to develop additional recommendations related to the new emerging topics of HeERO2.

**D6.7 Enablers and assessments in continuity of services**

The purpose of this document was to present the enabler for the continuity of service per pilot sites in a comprehensible and consistent manner. The overall evaluation is based on results of the pilot sites (Belgium, Bulgaria, Denmark, Luxemburg, Spain and Turkey). Each pilot site was requested to consider operational and technical aspects to reflect the assessment of their mobile networks, PSAPs and the relevant cross border aspects.
5.3.3 Dissemination Activities

Dissemination has formed a key part of the HeERO2 project across all of the Pilot Sites. During the lifetime of the project, Pilot Sites have demonstrated some very adventurous dissemination activities, which have culminated in a number of public events to inform the Citizen about eCall. This report believes that many of these activities, which were undertaken, could provide a template when the requirement to tell the citizen about eCall as deployment date approaches.

Task 5.3: Stakeholders dissemination

*Keep eCall stakeholders up to date + visibility for HeERO activities*

- **Main international events where HeERO have been promoted:**
  - 25 April - EeIP meeting - Brussels, Belgium
  - 28/29 May - PSCE Forum - Brussels, Belgium
  - 21-22 September - Nato days - Ostrava, Czech Republic
  - 2 October - EeIP meeting - Brussels, Belgium
  - 26 November - eCall Stakeholder Meeting on eCall - Brussels, Belgium
  - 9-11 December - Control Room Communications - Vienna, Austria

- **Newsletters (Feb 2013 and Jan 2014) sent to HeERO observers, ERTICO/EENA members...**

- **Website:**
  - News/events, Publication of deliverables
  - 20,923 visits / 14,675 unique visitors / % of new visits: 69%

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**Figure 24 Dissemination Activities Year 1**
Task 5.3: Stakeholders dissemination

Keep eCall stakeholders up to date + visibility for HeERO activities

- Main international events where HeERO have been promoted (non-exhaustive list):
  - 24-27 February - Mobile World Congress - Barcelona, Spain
  - 2 April - Forum for Automobile and Society debate on the future of mobility - Brussels, Belgium
  - 14 May - iMobility Challenge - Colmar-Berg, Luxembourg
  - 14 May - EeIP meeting - Brussels, Belgium
  - Summer: Contacts with newly elected Members of the European Parliament.
  - September/October: Hearing of new European Commissioners at the European Parliament: questions on eCall and 312
  - 9 October - iMobility Challenge - Barcelona, Spain
  - 13 November - EeIP meeting - Brussels, Belgium

- Newsletters (Jan. 2014, Jan. 2015) sent to HeERO observers, ERTICO/EENA members...
- PSAPs in Europe document: HeERO development included - sent to over 1,000 ESOs from 80 countries
- Website
  - News/events: All deliverables available online
  - 17,080 visits/12,110 unique visitors/% of new visits: 69%

Figure 25 Dissemination Activities Year 2

Task 5.3: Stakeholders dissemination

Website viewed by visitors from 123 countries:

- >10 views in 70 countries
- >50 in 43
- >150 in 29
- >500 in 11
- >1000 in 3

Figure 26 HeERO Global Reach
Task 5.4: Events organisation

- International events organised by HeERO partners:
  - 17/19 April - EENA Conference - Riga, Latvia
  - 4/7 June - ITS Europe Congress - Dublin, Ireland
  - 27-28 June - Roundtable on 112 - Antalya, Turkey
  - 10/13 September - FIA Mobility Conference Week - The Hague, the Netherlands
  - 26/27 September - eCall Days - Berlin, Germany
  - 14-18 October - ITS World Congress - Tokyo, Japan
  - 21-22 November - HeERO Conference - Bucharest, Romania

Figure 27 HeERO2 Events Year 1

Task 5.4: Events organisation

- International events organised in 2014 by HeERO partners:
  - 2/4 April - EENA Conference - Warsaw, Poland
  - 14 May - iMobility Challenge - Colmar-Berg, Luxembourg
  - 16/19 June - ITS Europe Congress - Helsinki, Finland
  - 16/18 September - eCall Days - Berlin, Germany
  - 7-11 September 2014 - ITS World Congress - Detroit, USA
  - 9 October - iMobility Challenge - Barcelona, Spain
  - 27-28 November - HeERO Conference – Madrid, Spain

Figure 28 HeERO2 Events Year 2
5.3.4 HeERO2 Publications

During the life of the project members of the consortium wrote a number of articles. Below is the list of these articles (non-exhaustive), shown in hyperlink format to allow for access to these articles.

**Events**

**News**

**Press Releases**

5.4 Lessons Learned and Conclusions

5.4.1 Lessons Learned

As stated in the objective listed in Chapter B.1 of the HeERO2 Description of work, the project was established to prepare the necessary PSAP infrastructure in the pilot site to act as a template for the remaining Member States who will need to upgrade their PSAP systems ready for eCall deployment.

Work Package 6 in HeERO2 was designed to identify the lessons learned during the project, and to suggest either mitigation or alternative strategies that could be followed to ensure that eCall based on 112 is successfully deployed across all Member States. In addition to this very specific work there have been the experiences of the pilot sites, which seek to amplify the comments from WP 6 HeERO1. This deliverable with the very extensive list of recommendations can be found here.

Below is reproduced the lessons learned from the pilot sites during the review process. This is a synthesis of discussions and is by no means exhaustive; however these are regarded as relevant topics at the time that this report was written.

- Regulatory Issues (European & National level) there is still a lack of clarity with regards the necessary legislation for the implementation of eCall. Whilst there have been significant steps to move forward in 2014 and now into 2015 however here is only a “No Later than” deployment date of the 1st October 2017 for the member state PSAP. This is not in line with the recommendation, which came from the European Parliament for the 31st October 2015. The lack of a clearly articulated go live date is causing some Member States to delay any action until actually required to do so. The report appreciates that this is now becoming clearer, however the report has observed that there is a feeling expressed by some member states that the necessary upgrade will only be implemented when they are legally obliged to do so.

- Technical issues (IVE, PSAP and MNO) – according to the latest version of the published standards and as it has been noted in this report - whilst the standards for the IVE and PSAP have been published and the HeERO1 and 2 projects have made significant progress on the testing validation and optimization of the standards, there
is yet to be published a unified or dedicated technical specification required for the design of the IVE.

- The installation of In-Vehicle Equipment. Tier 1 and 2 suppliers require defined specifications in order to manufacture the IVE for the vehicle makers. The impact of this has been noted in the HeERO2 project with the wide variety of performance from IVE recorded across the KPI defined for the project. During the lifetime of both of the projects no pre-production devices were provided for test, all devices were experimental only.

- Implementation of ‘eCall flag’: The HeERO2 project has shown that the implementation of the eCall flag is fundamental to the success of eCall deployment in Europe. Whilst the GSMA (Worldwide Industry Body for Mobile Networks) have been unequivocal supporters of eCall for a number of years, the same situation is not replicated with mobile network providers at member state level. There has been a very visible reluctance to implement the eCall flag on the grounds of cost and possible disruption to the network. Where the eCall flag has been implemented the filtering and routing of the eCall has been simplified, however current experience shows that this is not a simple process and the technical reaction of the network to the eCall flag can be variable. Some 112 emergency calls originated by certain non-conformant mobile handsets were recognised by mobile networks as eCall. The errant handset manufacturer has been informed and is taking corrective action to ensure that the eCall ‘identifier bits are not sent when originating a normal 112 emergency call. Note that the 112 caller would still be connected to a PSAP operator after a small (5 seconds) extra delay.

- The GSMA had undertaken to ensure that all Member State mobile networks should be upgraded by the 31st December 2014. The mobile network operators, in the light of the delayed deployment date, are now questioning this. Current experience in both HeERO1 and now HeERO2 has shown that delay is not conducive to a successful deployment; it is recommended that the mobile network be firmly encouraged to honour the pledge, which whilst the date has now passed would still have a positive impact on the planned deployment of eCall across Europe.

- SIM Cards – who is the owner of the card? There is a question surrounding the ownership of the SIM card, which will be embedded in the vehicle. This is an issue in a number Member States who are required to list the owner of a SIM. This needs to be resolved swiftly as clearly the SIM will be provisioned by the vehicle manufacturer, but in which Country, the Country of vehicle manufacture, or Country of sale?

- Numbering issues- a number of Member State Communication Regulatory bodies have raised an issue concerning the increase of telephone numbers that will be assigned as a result of eCall. The GSMA have been very clear with regards this issue that no issue is foreseen in that respect, and no additional action is required. However questions are now being raised as to the expected lifetime of a SIM in a vehicle and the implications for the correct management of the SIM number at the end of the life of the vehicle. In a recent statement GSMA have indicated that the industry consider that potentially a SIM would only have a lifetime of 10 years beyond that time the SIM would be disconnected from the network and would not function. This is also being linked to a direct issue of the cost of the SIM over the lifetime of the contract. In short the Mobile Networks are curtailing the life of the vehicle on commercial grounds, this is not appropriate, and clearly does not serve the purpose
of an emergency device, installed in a vehicle that could be rendered inoperable well within the lifetime of the vehicle. Clearly this matter needs to be resolved and swiftly.

- **eCall Data Retention** - the use of personal data for 112 is well regulated and has been in place for some time [Directive 2002/58/EC](https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32002L0058) refers, it is recommended that as eCall based on 112 is clearly another form of emergency [TS12](https://www.eurecat.cat) call then the same rules regarding data retention and management be followed. What has not been regulated is the management of personal data for TPS eCall; however this matter is outside of the scope of this report.

- **EUCARIS** VIN decoding is a vital aspect of the rescue sequence as this provides the exact make, model colour and year of manufacture of a vehicle. In addition EUCARIS can provide the vehicle owner details. However HeERO2 has discovered that not all Member States are permitted or wish to use EUCARIS. There are commercially available VIN decoders who will provide the initial information of Make, Model, and Year of Manufacture in 99% of all vehicles in Europe, these programmes should be publicised to make Member States aware. EUCARIS remains the Gold standard, but where a Member State cannot use EUCARIS these programmes are a viable alternative.

- **IVE in older cars in Europe**– the European vehicle fleet numbers some 239 million vehicles⁴. The deployment of eCall based on 112 for vehicles in category M1 and N1 will only affect new types of vehicle from the determined date. This will not affect those cars already on the roads of Europe this will minimise the potential effect of eCall. A number of Member States have already recognised this fact, and as a result are encouraging innovation in the development of aftermarket eCall systems that comply with the published standards but are cheaper to produce and sell. TheHeERO2projecthas looked at aftermarket devices, but more should be done to encourage the level of innovation to develop these devices in Europe. One of the main technical challenges is the provision of effective sensors, since aftermarket devices generally do not have access to the vehicles CAN bus.

- **Vehicle technical inspection by certified bodies** (legislation, cost, training, certification, exploitation of data, frequency of inspection) - This whole matter has been subject to considerable debate, and has been looked at by both the HeERO2 Standards Task force and the Periodic Test Inspection (PTI) task force from the European eCall Implementation Platform(EeIP).This matter is yet to be resolved meetings took place of Q4 in 2014 between the PTI Task force and the European Commission to provide clarity on this matter

- **Civil Protection Issues** (number of personnel, training, and implementation plan for full deployment). The full implications for the deployment of eCall based on 112 across Europe for the call handler and dispatcher is yet to be fully understood. The work undertaken in the HeERO2 project has already defined a [generic training manual](https://example.com) which is capable of being customised for all Member States, however the impact on staffing levels and operating procedures require further work, this can only be achieved once a deployment date and projected eCall deployment targets per Member State is known.

- **Cost of call back for Rescue Forces** - In a rescue situation after dialling 112 on a normal handset it is not unusual to call a person back to gain either more information

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⁴ *European Vehicle Market Statistics 2013*
or refine location. The situation for eCall is slightly different. As the device is fixed into a vehicle it may be necessary for the caller to leave the vehicle, this will involve the PSAP or the Emergency Services calling the person back on another device which is added cost for the PSAP. The project has also learned of some TPS service providers giving out premium rate numbers (High cost per minute called) to both PSAP and emergency services to call to obtain additional information about the rescue this report does not believe that this practice is conducive to the effective management of incidents.

- Commercial side TPS - third party services. Third party Service eCall exists now; the project has recognised an increasing trend in vehicle manufacturers launching their own TPS eCall service. All TPS services are a commercial arrangement between the vehicle owner and the service supplier. A Member State PSAP is not obliged to handle TPS eCall but it should be recognised that this could bring vital information to the PSAP. However the management of TPS eCall by a PSAP should be cost neutral to the PSAP, with any modifications required funded by the TPS provider. It should be recognised that TPS eCall will become more complex in the coming years with the advancement of advanced automatic collision detection which is due to be launched during 2015 by some vehicle manufacturers. These devices will increase the number of sensors and potentially the volume and complexity of data available.

5.4.2 Conclusion

The HeERO2 project has demonstrated the eCall based on 112 is a viable solution for Europe, however the results of project suggest that there are a number of challenges for eCall implementation.

The challenges relate to administrative and business issues (challenges in gathering full support from all stakeholders due to lack of legislative framework or legally binding decision to implement eCall on member state level and difficulties in assigning responsibility for eCall in a complex administrative situation) and to technical issues (weaknesses of IVE implementations and the fact that MSD transmission is not always successful, or a lengthy time delay). The recommendations addressing these four challenges are especially important when planning actions to support the deployment of eCall as a new ITS service.

Experience has shown the project that the most challenging issue is regarding organisational cohesion at a Member State level, which is required to ensure, an effective deployment of eCall in Europe, this needs to be recognised and dealt with by each respective Member State, and supported by a clear timeline to deployment for all stakeholders.