D1.3 Final Report

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CONTROL SHEET

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Document Purpose

This document is the final publishable report for the HeERO 1 project, which started in January 2011 and activities concluded for 8 of the 9 Pilot Sites in December 2013. The Greek Pilot Site received a 6 month extension to enable the pilot site to conclude all testing. The delay was due to organisational difficulties in the Greek administration Greece completed the HeERO project in June 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 HeERO 2, which is still active.

Main Results

The goals of the project were to evaluate the published standards on eCall based on 112, and to thus 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 issues of data privacy for eCall based on 112 are robust and have been in operation for a number of years; 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.

There still remains a lack of clarity for a start date for eCall deployment across Europe. This is hindering Member State in strategic planning and needs to be resolved.

Mobile Network operators should continue to upgrade their networks for the eCall Flag in line with the original GSMA commitment to upgrade by December 2014.

With 239 million vehicles on the roads in Europe consideration should be given to the introduction of aftermarket devices.

Periodic Test Inspection of the IVE in the vehicle needs to be formalised across Europe.

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.

2 Terms and abbreviations

Abbreviation	Definition
3GPP	3rd Generation Partnership Project
ACK	Acknowledgement
AMQP	Advanced Message Queuing Protocol
API	Application Programming Interface
AS	Application Server
ATS	Automatic Test Scenario
AVLS	Automatic Volume Limiter System
BTS	Base Transceiver Station
CCD	Call Centre Distribution
CCIVR	Contact Centre Interactive Voice Response
CC-PSAP	CoordCom product Public Safety Answering Points
CEN	Comité Européen de Normalisation
CIECA	Commission Internationale des Examens de Conduite Automobile
CIP	Competitiveness and Innovation Framework Programme
CITA	International Motor Vehicle Inspection Committee
CTI	Computer Telephony Integration
D-FACTS	Dutch First automated eCall Test Setup
DGPS	Differential Global Positioning System
DMZ	Demilitarized zone network
DoW	Description of Work
EC	European Commission
ENT	Ericsson Nikola Tesla
ERC	Emergency Rescue Centre
ERIC	European Road Information Centre
ETSI	European Telecommunications Standards Institute
EUCARIS	European CAR and driving license Information System
FIA	Fédération Internationale de l'Automobile
GIS	Geographic Information System
GLONASS	Global Navigation Satellite System
GNSS	Global Navigation Satellite System
GPRS	General Packet Radio Service
GPS	Global Positioning System
GSM	Global System for Mobile Communications
HAK	Croatian Automobile Club/Hrvatskiautoklub
HGV	Heavy Goods Vehicle
HLAP	High Level Application
HW	Hardware
ICT PSP	ICT Policy Support Programme
ICT	Information and Communications Technology
ISDN	Integrated Services Digital Network

IVE	In-Vehicle Equipment (Formerly In-Vehicle System)
IVV	International Association for Driver Education
KPI	Key Performance Indicators
MESRE	Mobile Emergency Service for Resuscitation and Extrication
MNO	Mobile Network Operator
MS	Member State
MSC	Mobile Switching Centre
MSD	Minimum Set of Data
MSS	Multi-Service Switching
MTS	Manual Test Scenario
NACK	Negative Acknowledgement
NAD	Network Access Device
NPA	National Police Agency
NRN	Network Routing Number
OEM	Original Equipment Manufacturer
PBX	Private Branch Exchange
PLMN	Public Land Mobile Network
P-PSAP	Primary Public Safety Answering Points
PSAP	Public Safety Answering Points
PSTN	Public Switched Telephone Network
RAN	Radio Access Network
RDS-TMC	Radio Data System - Traffic Message Channel
RRA	Romanian Railway Authority
RTP	Real-time Transport Protocol
RWS	Ministry of Transport, Rijkswaterstaat
SBAS	Satellite-Based Augmentation System
SIM	Subscriber Identity Module
SIP	Session Initiation Protocol
S-PSAP	Secondary Public Safety Answering Points
SS7	Signalling System No. 7
SSL	Secure Sockets Layer
SW	Software
TCP/IP	Transmission Control Protocol/Internet Protocol
TMC	Traffic Management Centre
TPS	Third Party Services
TPS	Third Party System
UMTS	Universal Mobile Telecommunications System
VIN	Vehicle Identification Number
VoIP	Voice over Internet Protocol
WAN	Wireless Area Network
XML	Extensible Mark-up Language

3 Introduction

3.1 Purpose of the document

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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 HeERO Contractual References

HeERO 1 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 270906 and project duration is 36 months, effective from 01 January 2011 until 31 December 2013, with a contracted extension from 1 January 2014 to 30 June 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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By electronic mail: CNECT-ICT-PSP-270906@ec.europa.eu

4 HeERO Consortium Partners

The below list are the beneficiaries from Grant Agreement 270906:

Beneficiary Number	Beneficiary Short Name	Beneficiary Name
1	**ERT**	EUROPEAN ROAD TRANSPORT TELEMATICS IMPLEMENTATION COORDINATION ORGANISATION S.C.R.L.
2	**ITSN**	ITS Niedersachsen GmbH
3	**ADAC**	ALLGEMEINER DEUTSCHER AUTOMOBIL CLUB E.V.
4	**OCN**	OECON Products & Services GmbH
5	**NC**	NavCert GmbH
6	**NXP**	NXP SEMICONDUCTORS GERMANY GMBH
7	**FHT**	Flughafentransfer Hannover GmbH
8	**CONT**	Continental Automotive GmbH
9	**S1nn**	S1nn GmbH & Co. KG
10	**MINTC**	LIIKENNE JA VIESTINTAEMINISTERIOE - MINISTRY OF TRANSPORT AND COMMUNICATIONS FINLAND
11	**VTT**	ValtionTeknillinenTutkimuskeskus
12	**RMB**	Ramboll Finland Oy
14	**MININ**	Ministry of Interior, Emergency Response Centre Administration
15	**MDCR**	Ceskarepublika - Ministerstvodopravy
16	**MinVNI**	Ministerstvovnitra
17	**ITSRO**	OrganizaţiaRomânăpentruImplementareaSistemelorInteligente de Transport - ITS Romania
18	**STS**	SERVICIUL DE TELECOMUNICATII SPECIALE - UM 0572 BUCURESTI
19	**RNCMNR**	CompaniaNaţională de AutostrăzişiDrumuriNaţionale din România - CNADNR SA

20	**URA**	UniversitateaRomâno-Americană
21	**UTI**	UTI Grup SA
22	**ELSOL**	Electronic Solutions
23	**MINGR**	Υπουργείο Υποδομών, Μεταφορών και Δικτύων (Ministry of Infrastructure, Transport and Networks, Greece)
24	**PCM**	PRESIDENZA DEL CONSIGLIO DEI MINISTRI
25	**MM**	MAGNETI MARELLI S.P.A.
26	**CRF**	CENTRO RICERCHE FIAT S.C.p.A
27	**ACI**	Automobile Club d'Italia
28	**TI**	TELECOM ITALIA S.p.A
29	**AREU**	AziendaRegionaleEmergenzaUrgenza
30	**NPRD**	Državnaupravazazaštitu i spašavanje (National Protection and Rescue Directorate)
31	**HAK**	Hrvatskiautoklub (Croatian Automobile Club)
32	**ENT**	Ericsson Nikola Tesla d. d.
33	**LSP**	LINDHOLMEN SCIENCE PARK AKTIEBOLAG
34	**STA**	Swedish Transport Administration
35	**ERIC**	ERICSSON AKTIEBOLAG
36	**ACTIA**	ACTIA NORDIC AKTIEBOLAG
37	**VCC**	Volvo Car Corporation AKTIEBOLAG
38	**RWS**	Ministerie van Verkeer en Waterstaat
39	**KLPD**	KorpsLandelijkePolitieDiensten
40	**EENA**	EUROPEAN EMERGENCY NUMBER ASSOCIATION ASBL

Table 1 HeERO Beneficiaries

5 Final Summary Report

5.1 HeERO Project Objectives

The HeERO project has a number of objectives, which are listed below. Following the year 4 technical review, it was concluded that all have been achieved.

It should be noted that for HeERO 2 many of these objectives were replaced as the requirements for eCall through the HeERO projects became more focused towards deployment.

The overall project objective 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 should take 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 objectives were identified for the European pre-deployment pilots:

5.1.1 HeERO project objectives and supporting tasks.

The nine HeERO 1 objectives are listed below:

Obj. number	Description of Objective
OBJ-1	Define operational and functional requirements needed to upgrade all eCall related service-chain parts (PSAPs-integrated rescue systems, telecommunication-112/E112, etc.) to handle eCall
OBJ-2	Implement available Pan-European eCall related European standards
OBJ-3	Implement needed technical and operational infrastructure upgrades
OBJ-4	Identify possible use of eCall system for public and/or private value-added services
OBJ-5	Produce the training materials for the eCall operators

OBJ-6	Assess certification procedures related to the eCall services equipment in liaison with CEN Project Team
OBJ-7	Produce recommendations for future eCall pre-deployment and deployment activities in Europe
OBJ-8	Promote pilots results and best practices with other EU Member and Associated States not involved in HeERO pilot
OBJ-9	Demonstrate interoperability and continuity of harmonised EU-wide eCall service

Table 2: HeERO Objectives

The specific tasks which allowed the pilot project to address the nine identified objectives are listed below:

Task 1: State-of-the-art analysis

The analysis of the eCall value chain with particular focus on the 112 response. E112 calls handling is to be undertaken to identify all necessary system implementation steps, in line with the annex I of the European Commission ITS Directive. The focus is:

- In-vehicle system equipment interface
- Telecommunication infrastructure (specifically 112/E112 related parts)
- PSAP infrastructure

The analysis defined the Hardware (HW) and Software (SW) set-ups required at different pilot sites and made available the initial background information for the definition of steps leading towards the eCall standards implementation. On this basis the In Vehicle System, 112/E112 and PSAPs needed upgrades were defined.

As far as the PSAPs infrastructure is concerned, this first analysis task aimed at understanding the technology upgrades required in the different participating EU Member and Associated States in order to accommodate the eCall service within national/local specificities in terms of PSAPs and Emergency Operations organisations, including operational and functional requirements. Currently the possible scenarios under discussion 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 accident;
- Combined organisation: in specific country areas the infrastructure will be centralised whereas in other areas it will be de-centralised

2. eCalls and 112 calls handling by the PSAPs

- 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 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. Where several organisations can be envisaged:
- 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)
- In some regions/areas direct handling of eCall, whereas in other areas indirect handling of eCall.

The type of organisation to handle the eCall will differ from country to country, mainly depending on the Member States specific emergency service organisational needs, the attribution of competences at national/regional/local level, the emergency response procedures, and the technological equipment installed in the PSAPs.

These different organisations need to be carefully tested to ensure the functionality and interoperability of the solutions that are to be deployed.

Finally, the state-of-the art analysis focused on the emergency operational upgrades that the eCall service will generate, this is to ensure the efficient handling of emergency situations generated by car incidents and the correct notification via in-vehicle eCall equipment using 112.

Task 2: Implement and test the European eCall agreed standards

The most efficient way to address interoperability issues is to use 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
- This European Standard defines the standard data concepts that comprise the "Minimum Set of Data" to be transferred from a vehicle to a 'Public Safety Answering Point' (PSAP) in the event of a crash or emergency via an 'eCall' communication session.
- CEN EN 16062 - eCall- High Level Applications Protocols
- This European Standard defines the high level application protocols, procedures and processes required to provide the eCall service using a TS12 emergency call over a mobile communications network.
- CEN EN 16072 - Pan European Operational Requirements for Pan European eCall
- This European Standard defines the general operating requirements and intrinsic procedures for in-vehicle emergency call (eCall) services in order to transfer an emergency message from a vehicle to a 'Public Safety Answering Point' (PSAP) in the event of a crash or emergency, via an 'eCall' communication session and to establish a voice channel between the in-vehicle equipment and the PSAP.
- EN/ISO 24978 ITS Safety and emergency messages using any available wireless media - Data registry procedures
- This European Standard defines a Standardized set of protocols, parameters, and a method of management of an updateable "Data Registry" to provide application layers for "ITS Safety messages" via any available wireless media.
- ETSI: In-Band modem transmission protocol
- In-band modem solution was selected as the transport protocol of the eCall related telecommunication transmissions. It enables to use the voice channel of the 112/E112 calls to carry the MSD payload from IVE to PSAP. ETSI Technical specifications defining the protocol are ETSI TS 126 267, ETSI TS 126 268, ETSI TS 126 269 and ETSI TR & TS 126 969
- ETSI: eCall discriminator
- The emergency centres have to be able to identify the emergency calls coming from road vehicles. To this purpose the eCall discriminator has been specified within ETSI MSG/3GPP and is part of the Release 8 of the GSM Standard (TS 124 008). This discriminator (also known as eCall Flag) will differentiate the 112 calls coming from mobile terminals from the in-vehicle eCalls and also between manually and automatically

triggered eCalls, allowing designing the PSAPs in the way best suited to national/local specificities.

These standards were tested and validated by the HeERO projects before Europe-wide real deployment takes place. The HeERO project provided a very valuable contribution to the European Standardisation Organisations (ESOs) for the finalisation and fine-tuning of these standards.

Task 3: Implement and test identified infrastructure upgrades

As a result of Task 1 and Task 2 activities, a number of infrastructure technical and operational upgrades will be implemented 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 eCalls 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

Concerning the VIN decoder tool, the European eCall Implementation Platform (EeIP), Task Force VIN is currently investigating the possibility of using the EUCARIS network as way to extract information from the VIN. In the case this solution will be endorsed by the EeIP, HeERO pilots will test and validate it in some Member States which have already implemented the EUCARIS application.

As for the operations' upgrade, it clearly appears that the implementation of the new emergency service eCall will generate the necessity to develop specific procedures in the emergency call centres to ensure handling the eCall in an efficient way. These procedurals upgrades may include:

- Operational procedures for handling eCalls (including, e.g., the case of no voice connection with vehicle occupants)
- 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 PSAP2
- Procedures for cross-border handling of eCall.

In terms of 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 eCalls from vehicles, and also between "Manually initiated eCalls" (MieC) and "Automatic initiated eCalls" (AieC). This functionality will allow the MNOs to identify eCalls and route the voice and the MSD to the most appropriate PSAP as defined by national governments and according to national arrangements.

Concerning the in-vehicle side the upgrades include:

- The Electronic Control Unit (ECU),
- The Positioning system
- The Communication system
- The Human-Machine Interaction (HMI)
- Their integration with the in-vehicle equipment (some of this equipment may already exist in the vehicle)

Other possibility may be the use of after-market equipment to provide the in-vehicle functionality. Both solutions should comply with the relevant European standards.

Task 4: Implement and test identified value- added services

eCall builds on technical components (e.g. satellite positioning, processing and communication capabilities) which can provide the basis for other in-vehicle private or public services and applications. The HeERO 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, with the vision of a more efficient incident and traffic management.

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

The EeIP Task Force PSAP-RO is currently addressing the need to establish the necessary common protocols so that the information about the incident can reach as soon as possible the road operators. The solutions identified by this TF will be implemented and tested in some test sites of HeERO project.

Additional commercial services

It will be convenient to introduce the eCall service 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.

Task 5: eCall pilots operations in real-life environments

During this task vehicles will be 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 transmission of the data (using the standardised protocols defined by ETSI and CEN) through the mobile network operators to the most relevant PSAP.

These eCall equipped vehicles will drive locally in the different participating Member and Associated States and internationally (multi-country) across participating Member and Associated States. This operation phase will happen in real-life situations and aims at testing the implemented components.

The goal is to test all systems required for the operation of the pan-European eCall, namely the mobile network (registering and connection in case of eCall only status and normal status of the NAD), the routing of the eCall, the answer of the eCall by the PSAP, the decoding of MSD and the dispatch of the call to the appropriate Emergency Service. Taking into account that this pilot is specifically addressing the interoperability of the service, the tests will not be limited to the national environments but will include multi-country demonstrations, as better described in the pilots’ descriptions.

Moreover, the full chain emergency management, involving emergency centres which dispatch the emergency vehicles (fire brigades, ambulances etc.) and including the arrival of the emergency vehicles at the accident scene will be included in this operation phase in some test sites. This test is extremely important as it would allow 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 accident severity. These tests will also confirm the information level of MSD or will identify new requirements for MSD (if appropriate)

Task 6: Pilots evaluation and final recommendations

This crucial task deals 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 will focus on the different national pilots' results and will produce recommendations for the different participating countries to be used for their future deployment activity. At the sometime the interoperability of the service will be assessed and recommendations will be provided to all Member and Associated States (also external to the project consortium) to ensure future deployment of the in-vehicle emergency eCall service in Europe comply with the interoperability and continuity principles.

The results of this task will be disseminated mainly through the European eCall Implementation Platform, and it is expected that the Task Force GUID will incorporate them into the "Pan-European eCall Implementation Guidelines" document which indicates the different steps to be undertaken by every eCall stakeholder to implement the eCall service.

Task 7: eCall certification

eCall is a life-saving system and, as such, a system/service Certification process should exist. In the past years the eSafety 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. ETSI and CEN have created Specialist Task Forces and Project Teams to elaborate test suites allowing certification of the communication equipment and End2End certification respectively.

eCall certification processes will allow compliance with the rules of vehicle type approval in many countries. The implementation of eCall certification will be needed both for the factory fitted equipment of the automotive OEMs and also for the retrofitting process and aftermarket installation.

The pilots will offer the opportunity to assess the certification and homologation test and procedures for the eCall systems and end-to-end services related to the whole chain, from the in vehicle devices to the PSAP software and equipment. It will also contribute to understand the needs in terms of Periodic Technical Inspection, and feed the work of the PTI Task Force within the EeIP.

HeERO certification activities will liaise with ETSI STF 399 and CEN TC 278 eCall End-to-End conformance testing Project Team.

Task 8: Promote Pilot Best Practices

HeERO project will regularly report its results to the European eCall Implementation Platform (EeIP). This will ensure that all Member and Associated States participating in the platform,

and especially those who could not be involved in the pilot for several reasons (budget constraints, not ready yet for pre-deployment, etc.), are regularly updated on the project progress and achievements. The current EeIP Task Force PILO, which was in charge to set up this pilot proposal, will be in charge of reporting the project progress to the Platform. HeERO coordinator ERTICO is also the PILO Leader, which makes this reporting task ease and guaranteed.

5.2 Pilot Activities in response to the objectives

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

Romania, Croatia, Czech Republic, Finland, Germany, Greece, Italy, The Netherlands and Sweden.

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 Croatia

112 in Croatia are handled by either a regional or county PSAP. There are two regional centres and two county centres. The difference between a regional and a county PSAP is determined by size and operational capacity

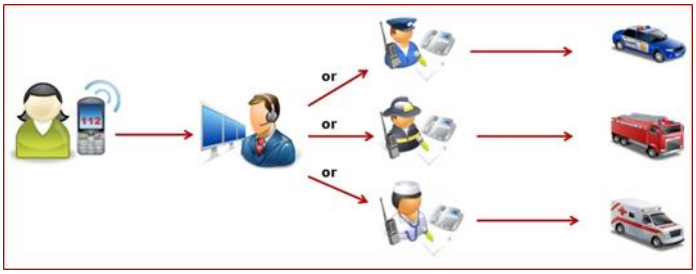

Figure 1 112 Architecture Croatia

The necessary upgrade carried out in Croatia saw the eCall based on 112 being dealt with in Zagreb, the eCall discriminator direct the eCall to the correct operator position in Zagreb, there is operational resilience in place at the other regional centre. The solution selected by Croatia, also allows the necessary information to be passed to the highway authorities for traffic management controls to be activated.

5.2.1.1 Test Description

Croatian eCall Pilot Architecture comprises the following components: IVE units (both the IVE simulator and commercial-grade units), Mobile network, PSAP. Those are to be implemented at the Croatian test site.

The components of the Croatian eCall Pilot Architecture are presented on Figure 2.below

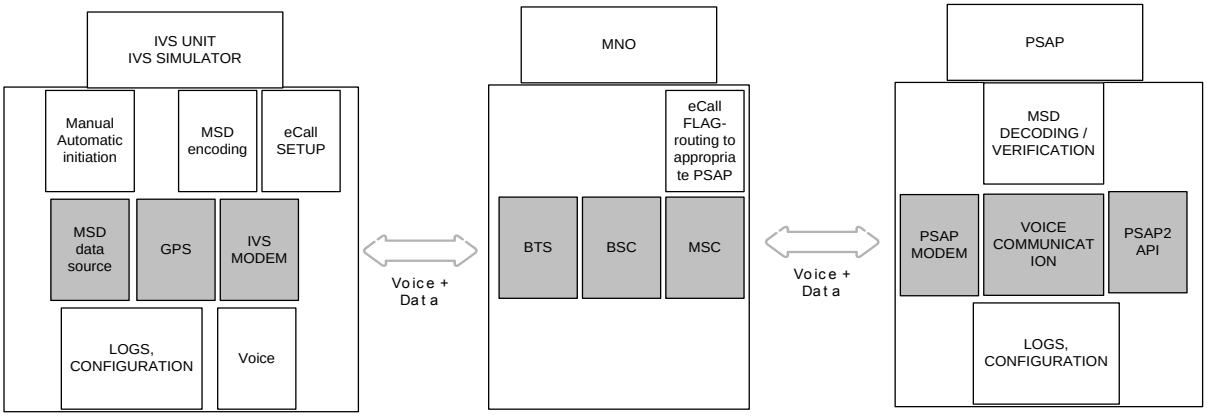

Figure 2 Croatian eCall Pilot Architecture (HR)

The eCall IVE units (both IVE simulator and commercial-grade units) are to be deployed as the Croatian eCall test bed components. The IVE units comprise features for setting up the eCall according to the most recent 3GPP and CEN eCall standards. The IVE will be configured to dial either 112 call with eCall discriminator, or to dial directly the PSAP number.

Both laboratory and real-network eCall test-beds will be deployed for the Croatian eCall Pilot activities. The eCall laboratory MNO component consists of fully functional mobile network, including the Radio Access Network (RAN) and the Mobile Switching Centre (MSC). The MSC is connected to the PSAP over standardized telecom infrastructure. The MSC software release is eCall discriminator-enabled, which allows for proper routing of the eCalls to eCall-enabled PSAP.

The PSAP components are fully eCall-enabled. After the eCall is received, an on-screen message is presented to the PSAP operator, and the PSAP operator is able to answer the eCall voice communication according to the eCall-related standards. A PSAP event logger is deployed, thus allowing for log maintenance and log transfer for further analysis.

5.2.2 Czech Republic

112 calls in the Czech Republic are taken on a regional principle. There are 14 regions in the Czech Republic. All 14 operations centres use, one large information system. In case of overloading of an operation centre, the call is routed to another one.

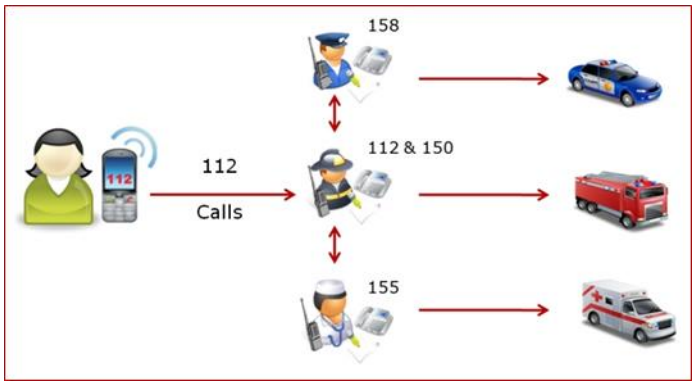

Figure 3 112 Architecture Czech Republic

The use of the eCall flag in Czech Republic was necessary to ensure that the eCall was directed to the correct operator position in the chosen PSAP. The architecture utilized by Czech Republic means that the operator receiving the eCall is also able to link to other PSAP operators in the event of the vehicle occupants not speaking Czech.

5.2.2.1 Test Description

eCall solution is integrated to the existing testing system for reception and handling of E112 in Czech Republic.

eCall enabled PSAP testing platform consists of:

- PBX with integrated PSAP modem
- CCIVR and CTI server
- Call taker application for 7 operators
- VIN decoder
- Communication module with interfaces to external systems (VIN decoder, TMS)
- GIS

The test architecture is shown below

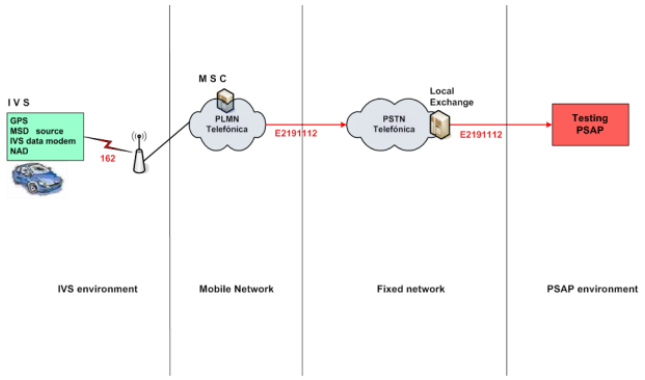

Figure 4 Czech pilot site architecture (CZ)

5.2.3 Finland

Finland is currently waiting for the delivery of a new PSAP system which will include all of the necessary specification to allow the effective management of eCall based on 112. The existing architecture will not alter just the equipment. The key feature of the ability of the new system to manage eCall, will the utilisation of the eCall flag by the mobile network operators to ensure the effective management of the eCall.

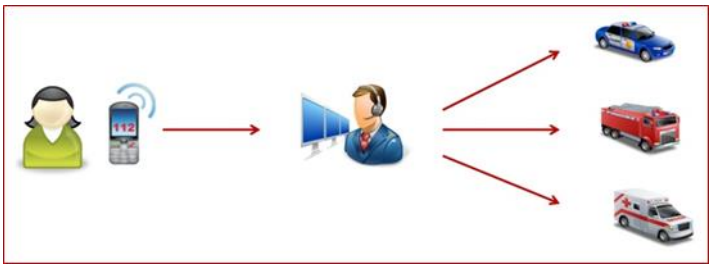

Figure 5 Finnish 112 architecture

5.2.3.1 Test Description

Finland has a single-layered PSAP system, which now has 6 PSAPs (In Finland referred as Emergency Rescue Centres) which all use the same central emergency situation handling system with connections to police and rescue forces, systems and databases. So when there is an incident on the road and someone phones to the PSAP/ERC from the scene, it is directed to the nearest PSAP which handles the call, makes the risk assessment and takes care of dispatching the appropriate units to help to the spot.

The system for HeERO first phase eCall piloting is built to simulate this straight-forward one-number emergency handling. The testing is done in simulated PSAP environment, and the experiences from the test bed will be exploited in updating the real PSAP system.

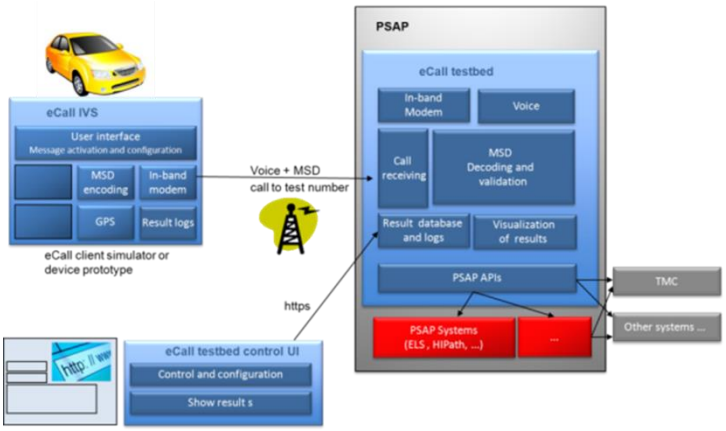

Figure 6 Pilot system architecture (FI)

5.2.4 Germany

Germany is a federal state. The 16 Länder that make the German federal state are in charge of emergency medical services, fire and rescue services, and police. Each Land has its own legislation as well as its own organisation.

Depending on regional organisational structures, the 2 below models are used:

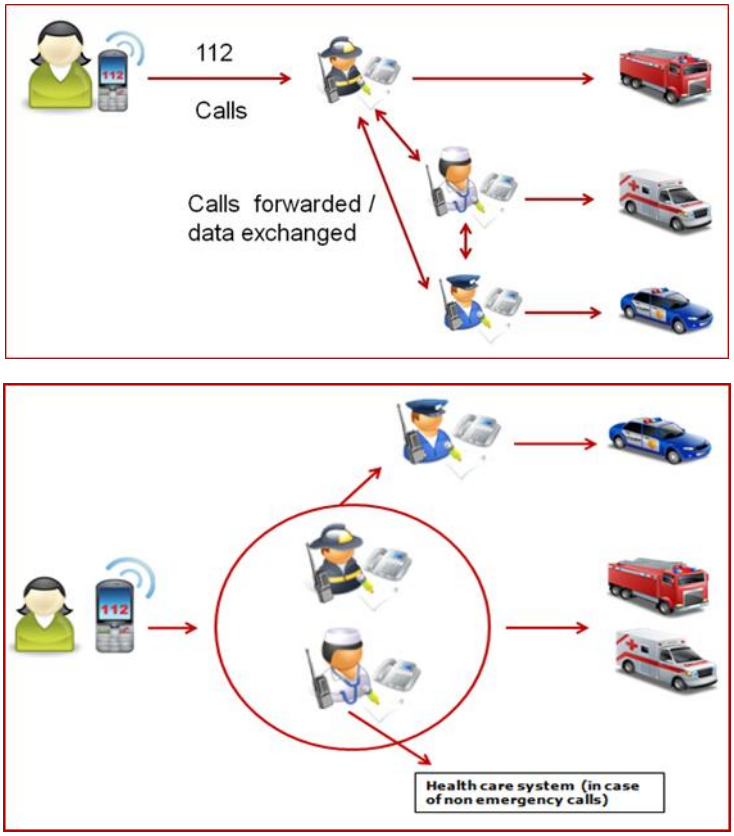

Figure 7 German PSAP architectures for 112

The result of the federated approach to 112 means that there are over 290 PSAP across the Länder which could potentially require upgrade to allow Germany to deal with eCall based on112.

The technical solution identified for Germany is unique and is reproduced below. In short the solution sits in front of the existing PSAP architecture allowing a highly flexible approach to deal with a number of different architectures and technical equipment.

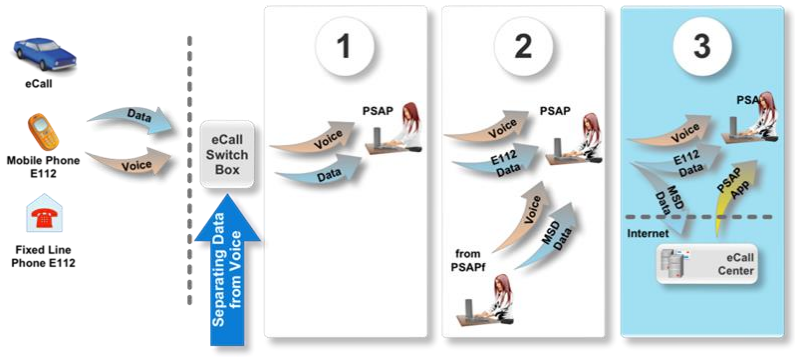

Figure 8Three different possible solutions for German PSAPs'

5.2.4.1 Test Description

The German National pilot was installed in December 2010 and included a PSAP test environment and IVE from two different suppliers. These systems are used during the HeERO project. The PSAP test environment is installed in the PSAP of Braunschweig; the IVE are installed into several Volkswagen cars from the Flughafen Hannover Transfer fleet to make sure the test fleet was moving every day.

Due to the fact that the eCall Flag is not implemented in any of the German Mobile Networks, the team decided to use a long number. This means also that the calls were not given any priority in the Mobile Networks (as it is the case with native 112 calls). However, in the team's estimation this did not influence the tests.

The tests involved an automatic and a manual scenario:

- During the automatic scenario, eCalls were sent automatically every ten minutes.
- The manual eCalls were initiated during special days for testing. On these days the team was driving the cars to several chosen locations and then started the eCall by pressing the manual eCall Button.

In the PSAP, two operators were given the necessary instructions to handle eCalls. During the manual eCall test phase these operators processed the incoming calls. During the automatic test phase, the PSAP test environment answered the incoming eCalls automatically without intervention.

5.2.5 Greece

The 112 service in Greece is operated by the General Secretariat for Civil Protection, which is part of the Ministry of Public Order and Citizen Protection. The PSAP solution is on two levels level one for call takers level two for emergency response. The single PSAP for Greece is located in Athens

The eCall solution utilised by Greece, is based around the existing PSAP solution which was installed for the 2004 Olympic Games. The solution is “Off the Shelf”, and was implemented with the eCall flag by one of the mobile phone operators.

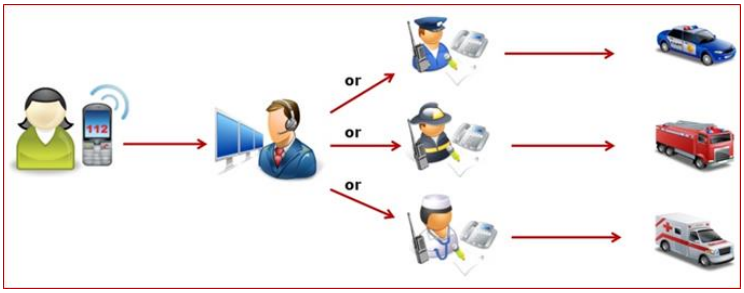

Figure 9 112 architecture Greece

Greece will shortly take delivery of a new PSAP system which will utilize the performance requirements from the HeERO project.

5.2.5.1 Test Description

After some initial laboratory tests in July-September 2013, the on-road tests in Greece were performed during November and December 2013. The complete eCall chain was evaluated, namely from the time point when an eCall was generated by the IVE, passed through the mobile and fixed network and reached the PSAP which was installed at the premises of MINGR in Athens, Greece. The eCall was answered by a trained operator. The pilot site architecture is shown below.

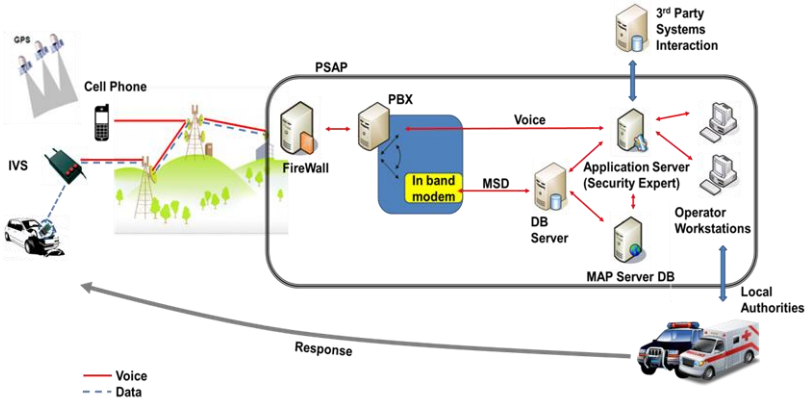

Figure 10 Greek Pilot Site Architecture

5.2.6 Italy

112 in Italy is the number for the “Armadei Carabinieri” that is a gendarmerie force which acts as both the military police and one of the three national police forces in Italy, as well as the single emergency number for the rest of Europe.

The solution adopted in the Piedmont region of Italy provided a filtering instance that received all 112 calls for the area and filtered out the inappropriate 112 calls as well as

managing the eCall, and bCalls. This is one of a number of possible architectures available for Italy. Currently the choice on which architecture to follow is a political and technical decision by the Italian Government.

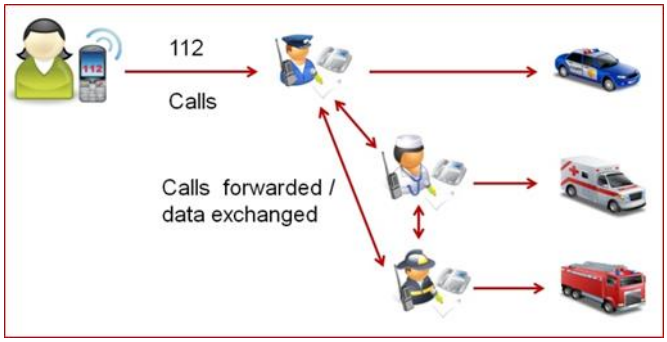

Figure 11 Basic Model of 112 Italy

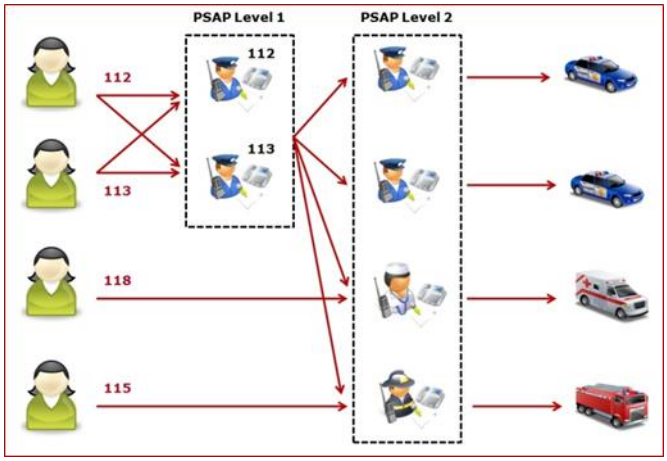

Figure 12 Salerno 112 model

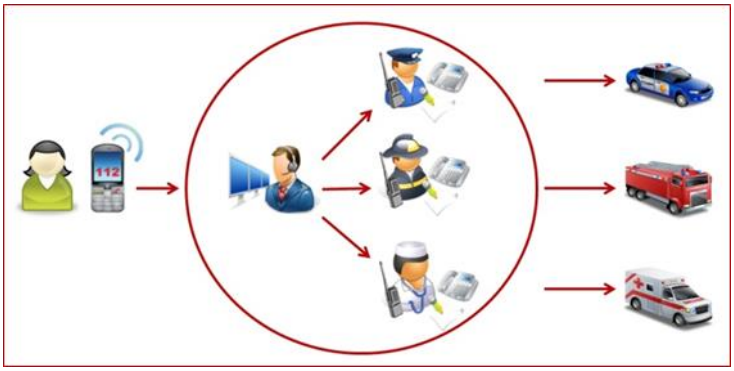

Figure 13 eCall 112 Solution Varese Italy

5.2.6.1 Test Description

The working chain tested for eCall is:

- Initiating the eCalls, both automatic and manual, from one of the IVEs in the CRF Fiat vehicle circulating into Varese city area; each IVE has a SIM connected to TIM mobile operator;

- through the TIM test radio base station cell located in Varese, which has been updated to manage the eCall flag, the eCalls are routed on the 112 fixed telephone network, on two specific lines, one for automatic calls and one for manual calls;
- both these lines are linked to the AREU 1st level PSAP, where the calls are taken and the MSD decoded; then the calls are inserted into the specific eCall queue waiting the operator to pick them up;
- when an operator takes a call, the MSD data are displayed on the screen with the GIS location and the voice channel is activated; some vocal tests are performed to evaluate the quality of the voice channel.

5.2.7 The Netherlands

In The Netherlands, 112 calls made from mobile phones are handled in one national PSAP. The civilian call-takers locate the call and forward it to the most suitable regional emergency organisation or to one of the special emergency organisations (Highway patrol, River police, Railway police, Aircraft police, Coastguard and Military Police Schiphol). 112 calls coming from fixed lines are routed to the most appropriate regional centre.

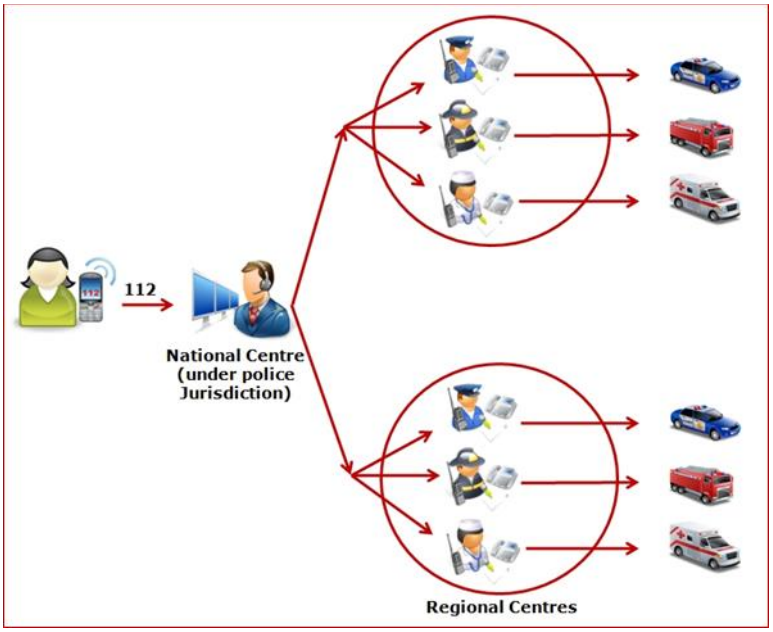

Figure 14 112 from mobile phones including eCall Netherlands

Currently the Netherlands are the only pilot site to discriminate between manual and automatic eCall. Manual eCall when received are still screened to check if the call is appropriate, automatic eCall is sent straight to the dispatcher for the mobilisation of the emergency response.

5.2.7.1 Test Description

In The Netherlands testing was done in both a laboratory environment and by performing Drive Tests. The testing in the laboratory environment was done in July 2012, prior to the Drive Test to ensure that the IVE's, the PSAP and the link to the TMC were functioning in accordance with standards and that there were no problems that would have influenced the outcome of the Drive Test.

The Drive Test was conducted using a system that automatically triggered eCalls every minute on all connected IVE's. For the PSAP a separate non-live 112-system adapted for eCall was used. A script was programmed for the PSAP software that would automatically answer each incoming eCall, establish voice contact for 10 seconds (actual voice contact was not measured) and then terminate the eCall. This made it possible to generate a large amount of eCalls (>6.000) with a limited amount of labour resources.

5.2.8 Romania

In Romania all 112 calls are routed to the most appropriate PSAP, county-based. 41 Call Centres (one per county). One Call Centre connects all emergency intervention services in the county.

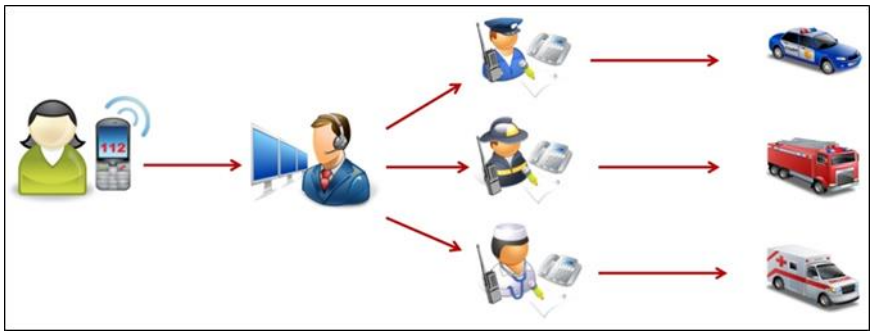

Figure 15 112 Architecture Romania

To provide the correct response to eCall based on 112 in Romania, the eCall flag was utilised to ensure that the eCall was directed to one of the PSAP (Bucharest), and then to a dedicated position. This solution ensures a uniform approach to the handling of the eCall in Romania, yet remains a scalable solution as the number of eCalls' increase.

5.2.8.1 Test Description

Before implementing eCall functionalities in the live system, laboratory tests were made to ensure that each eCall module is fully functional and in accordance with standards and there are no compatibility problems with the existing 112 system. Starting with January 2012, Romania implemented the eCall solution in the live system and all tests were made by receiving eCalls in the live PSAP in Bucharest. From the beginning dedicated operators were

used for answering eCalls. The calls are taken using the same application as the 112 operators and a beta version of GIS application.

In the first operational phase tests were made tests only with the primary eCall PSAP, without involving the backup site from Braşov.

The working chains tested until now are:

a. Initiating eCalls from the IVE in vehicle, using public MNOs and the STS multiservice network, to the eCall operator situated in the 112 PSAP (without involving emergency agencies);

b. The entire chain IVE-MNO-STS network-PSAP-Emergency agency was tested with simulated agency operators without disturbing the emergency agencies' activities.

In the second phase of operations the Braşov backup site will be involved in tests and tests will be done with the emergency agencies involved, until resources reach the incident site. Orange Romania also implemented eCall flag in a test cell located in Bucharest and after the testing period they will extend the implementation in operational cells.

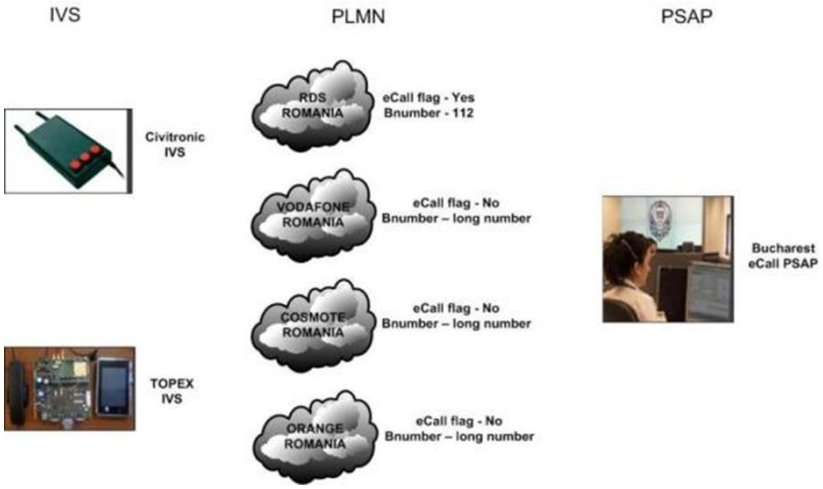

Figure 16 Testing environment (RO)

5.2.9 Sweden

112 calls in Sweden are handled by a private company (SOS Alarms) under licence from the Swedish Government.

For operational reasons the PSAP did not take part in the project to maintain integrity of the 112 system. However SOS Alarms have been a close observer of the project.

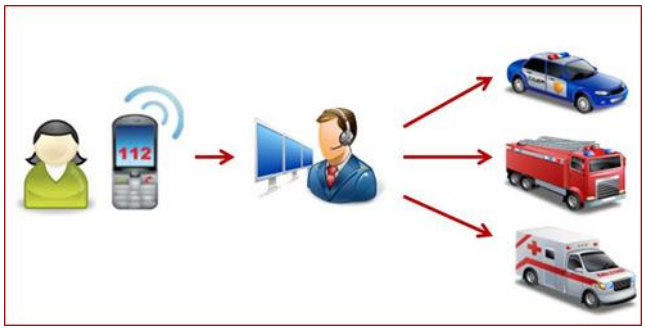

Figure 17 112 Architecture Sweden

There are currently 14 "112 PSAPs" located throughout Sweden. These centres are in the process of being rationalized, however the solution chosen for Sweden will rely on the eCall flag for the correct routing of the eCall to dedicated positions with trained operators.

5.2.9.1 Test Description

This chapter presents the essential testing framework of the Swedish eCall Pilot. The deployed system in support of the eCall service comprises: IVE (two different manufacturers), PLMN (two Swedish mobile network operators with networks with nation-wide coverage and with support for eCall Flag-handling, and one test mobile network) and PSAP (three separate PSAP environments).

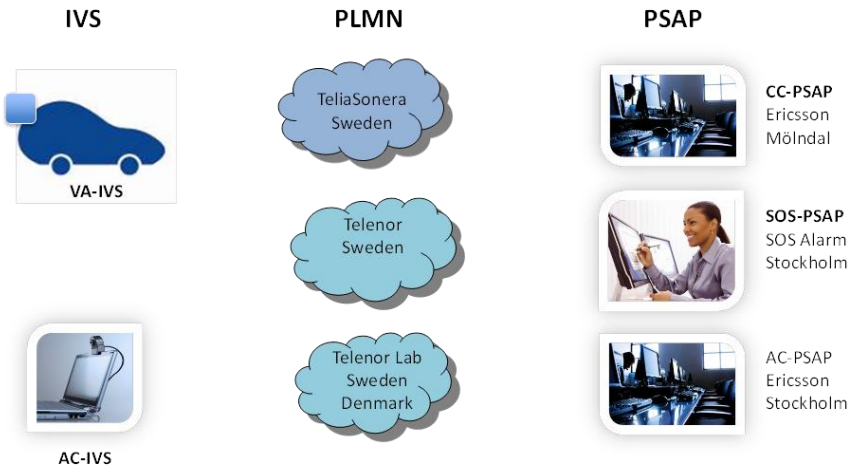

Figure 18 Overview of the test environment (SE)

The eCall flag handling was implemented throughout Sweden in the existing mobile networks of TeliaSonera and Telenor. All eCalls use the eCall flag and are routed to a test-PSAP (Public Safety Answering Point) at the premises of Ericsson in Mölndal, Sweden. This test-PSAP is based on the same system (CoordCom) that is used by the Swedish PSAP operator SOS-Alarm. Handling of Pan-European eCall with the In-Band Modem technology has been added to the CoordCom system.

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 *HeERO_WP4_DEL_D4 5-results_v1.0.* 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 HeERO project.

The intent of the HeERO 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 HeERO 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

Two of the key indicators for the project were KPI 005 Duration until MSD is presented in PSAP and 007 Duration of voice channel blocking. These two KPI have a direct impact on the ability of the PSAP operator to visualise the data, and thus deal effectively with the call, and the how long the vehicle occupant has to wait to be able to talk to the PSAP.

Below is the data represented in graph form to show how each pilot site performed.

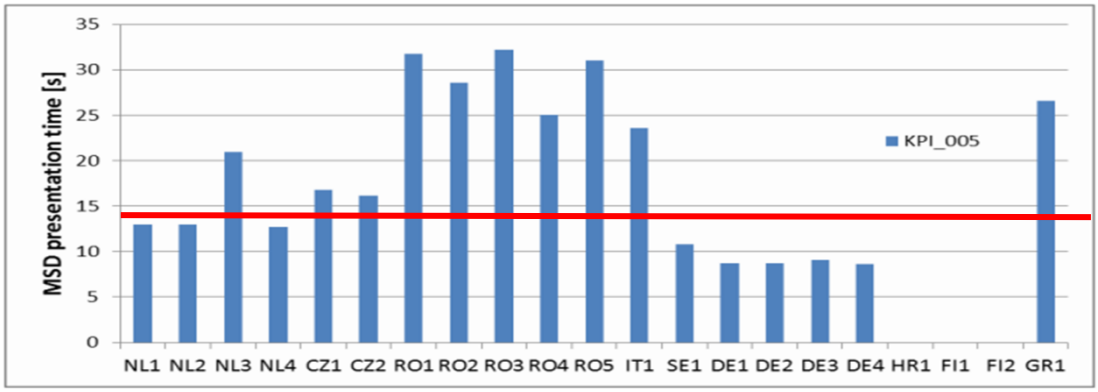

Figure 19 KPI 005 MSD Presentation Time

As can be seen from the graph above there was a wide variation in the time taken to present the MSD at the PSAP. This has been attributed to

1) The fact that none of the IVE used in HeERO 1 (or HeERO 2) are production units, most are at the development stage. As such they remain highly configurable with a high number of settings that can be varied.
2) The networks used were in the main not using the eCall flag, therefore long number dialling has to be used, however this was not always the case, as for example Greece utilized the eCall flag.
3) The architecture used in each PSAP or emulator were not uniform across Europe, in the instance of HeERO 1 9 different solutions were applied to allow eCall to be received.

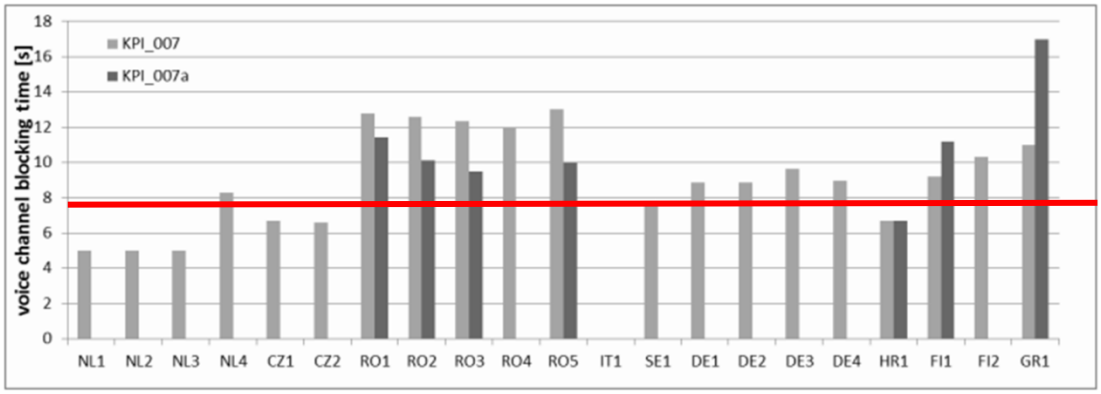

Figure 20 KPI 007 and 007a Voice Channel Blocking

Again with KPI 007 and 007a (Where tested) there was not a uniform set of value achieved across the pilot sites. The result of both of these charts (KPI 005 and 007) showing all of the pilot sites demonstrates the clear need to ensure that the conformance assessment that will be required for each PSAP before it is declared ready to receive eCall should be carried out in a uniform manner by a coordinated body across all Member States.

The chart below display the results of KPI 005 and 007 and gives recommended target values for each of the two KPI listed. For comparison I have also added the mean value to Figure 20 and 21.

[seconds]	mean	median	std. dev.	minimum	maximum
KPI05	14.5	13.0	6.0	8.6	26.6
KPI07	7.9	8.3	1.9	5.0	11.0
KPI07a	7.9	8.3	1.9	5.0	11.0

Figure 21 Recommended target values

5.3.1.2 Interoperability Testing.

As the eCall based on 112 is designed to work seamlessly across Europe, there was a requirement to test inter-operability to ensure that no matter where the vehicle originated from within Europe, the eCall would work.

The below chart illustrates the number of tests undertaken by each pilot site to test the abilities of the respective IVS.

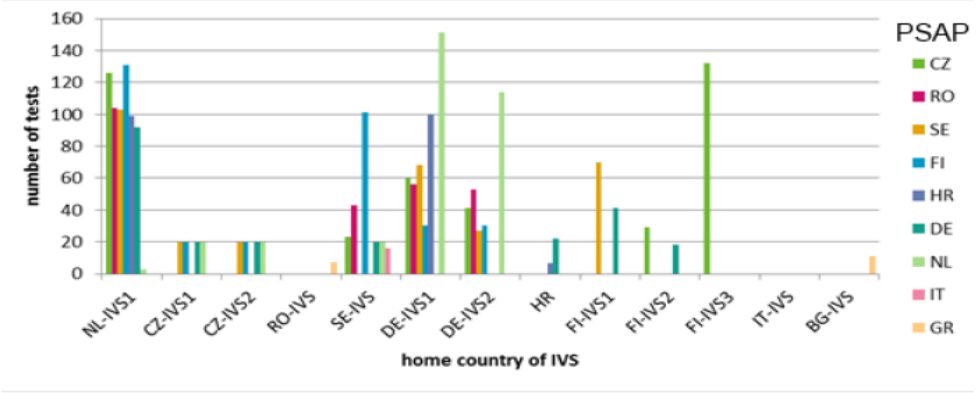

Figure 22 Number of Interoperability Tests

As can be seen there was a wide spread of testing undertaken. It should not be forgotten that both HeERO 1 and 2 PSAP took part in the 2013 “TestFest” for both PSAP and IVE manufacturers

5.3.1.3 Conclusions

The intent of the HeERO pilot sites has been to evaluate if the requested performance of the eCall service can be met with a deployment of the approved eCall standards in the existing public mobile 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 HeERO 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.

5.3.2 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 is a table of all publicly available deliverables produced by the HeERO 1 consortium 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

HeERO_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 HeERO project member state

HeERO_WP2_DEL_D2_2_Functional_specification_final

This document will focus 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 HeERO 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.

HeERO_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 will be 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

HeERO_WP2_D2 4_System_test_cases_and_verification_report_v1 1

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.

HeERO_WP2_D2.5_Manual_for_operator's_training_v1 1_Final

This deliverable provides an overview of eCall and how it operates

HeERO_WP2_D2.5_Manual_for_operator's_training_with_Annexes_v2.05_Final

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

HeERO_WP2_D2 6_Final_system_test_cases_v1 03

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 are:

- 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 eCalls
- Pan European solution key points
  - IVE interface
  - eCall discriminator (eCall Flag)
  - VIN decoder
  - Traffic Management Centre interfaces
  - TPS system interface
- Inter-operable services

HeERO_WP3_DEL_D3.1-Pilot operation preparation report_V1.22

The purpose of this document is to highlight the operational aspects of the eCall pilots implemented in all the member states participating in HeERO. 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.

HeERO_WP3_DEL_D3.1-Pilot operation preparation report_V1.22 ANNEX (3)

This document contains the eCall workflows for each pilot site

HeERO_WP3_D3 3_Final Operational Results_v2.3_FINAL

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 HeERO Project

Work Package 4 Evaluation

The main objectives of WP 4 are:

The main objective of this WP is 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.

HeERO_WP4_DEL_D4 2 V1.3_Final

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.

HeERO_WP4_DEL_D4.3 Intermediate Results of the Tests_ver1.3

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

HeERO_WP4_DEL_D4 4-results_1.1

The purpose of this document was to present the 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 HeERO project. Each pilot site was requested to provide statistical evaluations of the measured KPIs, recommendations and conclusions.

HeERO_WP4_DEL_D4 5-results_v1.0

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 HeERO project. The overall evaluation was based on the results of the pilot sites (Croatia, Czech Republic, Finland, Italy, Germany, Greece, Romania, Sweden and The Netherlands). 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:

- 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

HeERO_WP5_D5.2_HeERO Website

This website is maintained for both HeERO 1 and for HeERO 2

HeERO_WP5_D5.3_HeERO Flyer

This dissemination document applies to both HeERO 1 and 2 and was revised to increase public understanding of eCall.

HeERO_WP5_D5.4_HeERO Site Compendium

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

HeERO_WP5_D5.5_ HeERO Newsletter Issue 1

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

HeERO_WP5_D5.5_ HeERO Newsletter Issue 2

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

HeERO_WP5_D5.5_ HeERO Newsletter Issue 3

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 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 end ethical issues.

The specific objectives were:

- Identify deployment barriers at specific local level but also common to all MS, including legal ones, and propose measured to overcome them.
- Identify deployment enablers relevant to industrial partners, relevant to authorities and relevant to end-users
- Identify possible use of eCall system for public/private value added services
- Identify the needs for certification and define recommendations for the certification process
- Define the eCall Deployment Guidelines
- Produce Recommendations for eCall Implementation and Operation in European Member and Associated States

HeERO_D6.1b_V1.5_final

The purpose of this document was to gather experiences of the first round of HeERO piloting and summarise them in one report as preparation for the Guidelines.

HeERO_D6.2_Deployment_enablers_and_opportunities_and_challenges_v.0.8

This document aims to provide detailed results on the barriers and enablers for deployment of eCall identified during HeERO piloting and to summarise them in one report. The results of the work will be used in preparation for the Guidelines for eCall implementation and operation.

HeERO_WP6_D6 3_Needs for eCall certification_V1.0

The Deliverable D6.3 provides a preliminary consideration on certification needs for eCall taking into account a report of the HeERO consortium partners' knowledge in certification collected by using specific questionnaires which highlight their experiences and needs.

It should be stressed that this is an interim report which will be reflected in the Description of Work for HeERO 1 a more comprehensive and embracing deliverable will be issued through HeERO 2.

HeERO_D6.4-eCall Guidelines_v1.1

Deliverable D6.4 is one of the final deliverables of HeERO project. It gathers the experiences of HeERO piloting into a Guidelines and best practises for stakeholders in new eCall projects and deployment.

HeERO_WP6_DEL_D6 5-Recommendations on implementation and operation of eCall_v0 5

The objective of the report is to provide recommendations for implementation and operation of eCall in Europe. The aim is that the recommendations should cover both implementation and operation of eCall, the whole eCall service chain and address actions on both European and member state level. Special attention is paid to the needs for further standardisation and guidelines.

5.3.3 Dissemination Activities

Dissemination has formed a key part of the HeERO project across all of the Pilot Sites. During the life time 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 can provide a template when the requirement to tell the Citizen about eCall as deployment date approaches.

5.3.4 HeERO 1 Publications

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

1/01/2011 - Start of the Project HeERO

7/06/2011 - HeERO: the way to eCall harmonisation passes through Lyon and the ITS European congress (HeERO Consortium)

February 2012 - HeERO Newsletter - Issue 1

26/07/2012 - Safer roads ahead, a documentary on HeERO project prepared by Euronews

15/11/2012 - Outcomes of the first HeERO International Conference

14/01/2013 - As HeERO expands, pan-European eCall moves to next step

February 2013 - HeERO Newsletter - Issue 2

17/04/2013 - 112 Awards 2013 - The Croatian eCall Pilot Site won the Outstanding eCall Initiative Award!

21/11/2013 - Deployment of the pan-European eCall service in Europe: results officially presented in Bucharest 21-22 November 2013

January 2014 - HeERO Newsletter - Issue 3

5.4 Lessons Learned and Conclusions

5.4.1 Lessons Learned

As stated in the objectives listed in Chapter 5.1 of the HeERO 1, the project was set up 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 HeERO 1 (and HeERO 2) were 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. 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, there is only a “No Later than” deployment date of the 1st October 2017. 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.

- 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 HeERO 1 project has 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. Defined specifications are required by Tier 1 and 2 suppliers in order to manufacturer the IVE for the vehicle manufacturers. The impact of this has been noted in the HeERO project with the wide variety of performance from IVE recorded across the KPI defined for the project.
- Implementation of 'eCall flag' The HeERO 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. This is now being questioned by the mobile network operators, in the light of the delayed deployment date. Current experience in both HeERO 1 and now heERO2 has shown that delay is not conducive to a successful deployment; it is recommended that the original date for the implementation of the eCall flag be honoured.
- 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.
- 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 refers, it is recommended that as eCall based on 112 is clearly another form of emergency TS12 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 HeERO has discovered that not at Member States are permitted or wish to use EUCARIS. There are commercially available VIN decoders who will provide the initial information of Make, Model, Colour 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 sue EUCARIS these programmes are a viable alternative.
- IVE in old cars in Europe - there are currently an existing vehicle fleet of 239 million vehicles[1]. 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, thereby minimising the potential effect of eCall initially, this will increase over time. 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 standard but are cheaper to produce and sell. Both HeERO projects have looked at aftermarket devices, but more should be done to encourage the level of innovation to develop these devices in Europe.
- 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 HeERO 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 satisfactorily however

[1] European Vehicle Market Statistics 2013

there will be meetings at the beginning of Q3 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 HeERO project has already defined a generic training manual 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 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 being launched in 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 HeERO 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). The recommendations addressing these four challenges are especially important when planning actions to support the deployment of eCall as a new ITS service. These challenges are highlighted are continuing to be addressed in HeERO 2 on technical front. Experience has shown the project that the most challenging issue is regarding organisational cohesion at a Member State level which is required to ensure and effective deployment of eCall in Europe, this needs to be recognised and dealt with by each respective Member State