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2018 revision

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info@eena.org - www.eena.org

This document was updated with contributions of the following EENA members:

Name	Organisation
Bergonzi, Luca	Beta80 Group
Lumbreras, Cristina	EENA

Contributors to the previous version of this document:

Name	Organisation
Bergonzi, Luca	Beta80 Group
Bishop, Cathy	Onstar
Lumbreras, Cristina	EENA
Maher, Ann	Onstar
Moseley, Russell	Voltdelta
Novak, Gorazd	Iskratel
Öörni , Risto	VTT Finland
Rooke, Andy	Ertico
Verlinden, Thom	National Police, NL

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1 Introduction

Traffic incidents are one of the major causes of deaths and injuries in Europe. A timely and efficient intervention of emergency services is crucial to save lives and reduce human suffering.

This is the main reason why there is a need for an automated method to alert emergency services about incidents. eCall is an in-vehicle emergency call system which:

- automates the notification of sever traffic incidents. It transmits data from the vehicle and establishes a voice channel between the vehicle passengers and emergency services.

- allows vehicle occupants to manually (potentially through a button) alert emergency services of other emergencies in or around the vehicles such as a vehicle occupant with a medical emergency or reporting the need for emergency services on behalf of another person.

The objective of this document is to assemble all currently available information about eCall and highlight the still open issues.

2 Approaches to provide eCall

The **112-based eCall** uses the 112 number to send data and to establish the voice channel between the passengers of the vehicle and emergency services.

Drivers can also decide to contract a private eCall service supported by **Third Party Service Providers (TPSP)**. In this case, the data and the voice arrive first to the Third-Party Service Provider's call centre and then, in case of real emergency, data and voice are forwarded to the most appropriate Public Safety Answering Point (PSAP) using the 'long' number of each PSAP. If 112 is dialled instead of the e.164 'long' number of the PSAP, the call will always arrive to the PSAP handling emergencies in the area where the TPSP call centre is that usually is not the same where the emergency happens. TPSPs need to have data about boundaries and contact details of emergency services in the different countries where they are giving service.
Emergency service can decide to accept or not calls from TPSP.

112-based and TPS eCall are services that will potentially coexist. TPS is not replacing public 112-based eCall.

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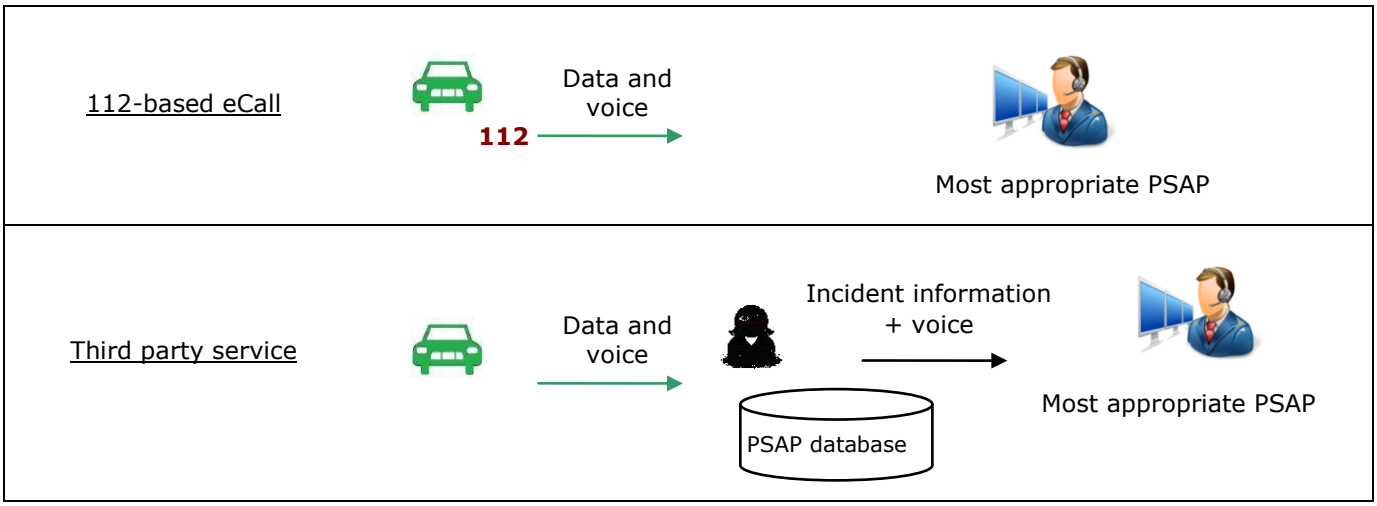

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3 Legislation and regulation

3.1 Background and timeline

Owing to the lack of progress for the voluntary deployment of eCall, the European Commission recommended that the deployment should be mandated. The following table summarizes the chronology towards the eCall implementation.

Recommendations		
2009	Impact Assessment	EU Commission
8 September 2011	strategy on regulatory measures for eCall Commission Recommendation	EU Commission
3 July 2012	non-legislative resolution report on eCall: urged the Commission to submit a proposal within the framework of Directive 2007/46/EC to ensure the mandatory deployment of a public, 112-based eCall system by 2015 in all new type-approved cars and in all Member States	EU Parliament
26 November 2012	Delegated Regulation (EU) No 305/2013 supplementing Directive 2010/40/EU of the European Parliament and of the Council about the harmonised provision for an interoperable EU-wide eCall.	EU Commission
Legislation		
13 June 2013	a proposal for a Decision of the EP and Council on the deployment of the interoperable EU wide eCall in the PSAPs, in accordance with the specifications laid down by Delegated Regulation (EU) No 305/2013	EU Commission
14 April 2014	European Council adopt the deployment of eCall	EU Council
3 June 2014	Amendment to type approval discussed	EU Parliament and Council
28 April 2015	eCall Regulation voted	EU Parliament
Operations		
1 October 2017	Deadline for All European PSAPs to be ready with required infrastructure to handle eCalls	Member states
31 March 2018	All new homologated vehicles manufactured from this date must be equipped with eCall-compatible IVS devices	Car manufacturers

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3.2 eCall Regulation[1]

Of the three technical elements necessary to make 112-based eCall work 1) Vehicle 2) Mobile Network 3) Public Safety Answering Point, items 1 and 3 are mandated. Third party service providers are also part of this regulation. All the necessary measures for legislation have now been completed; the current requirements can be found below.

1) Public Safety Answering Points:

- the deployment, of the eCall infrastructure required for the handling of eCalls on the EU territory, with a final deadline for the deployment set at **October 1, 2017**.
- the right of each Member State to organise its emergency services in the way which is most cost effective and appropriate to its needs.
- 112 eCall handling free of charge for the users.

2) In-vehicle equipment:

- The legislation for the in-vehicle equipment is dealt with by an amendment to the Type Approval Regulations. eCall will form part of the type approval regulation for all new types of M1 and N1 vehicles (passenger cars and light duty vehicles) from **31st of March 2018**.

> *With effect from 31 March 2018, national authorities shall only grant EC type-approval in respect of the 112-based eCall in-vehicle system to new types of vehicles and to new types of 112-based eCall in-vehicle systems, components and separate technical units designed and constructed for such vehicles which comply with this Regulation and the delegated and implementing acts adopted pursuant to this Regulation.*

3) Third Party Service provider:

- Third Party Services are allowed but not mandatory. They shall comply with the standard EN 16102:2011 .

[1] http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32015R0758&from=EN

4 112 -Based eCall

4.1 Overview

In case of an incident, the deployment of one or more sensors generates an automatic eCall with the immediate transfer of the crash data. The generation of this type of eCall is dependent on the sensors system in the car.

Additionally, an eCall can be manually activated by vehicle passengers. The design and implementation of the mechanism to trigger a manual eCall (e.g. SOS button) has yet to be determined by vehicle manufacturers. In doing so, they must make best efforts to minimise the accidental activation of eCall.

The 112 number is used to establish the voice channel between the passengers of the vehicle and emergency services as well as to send car-related data. It is based on a quasi-simultaneous data and voice link over the same channel (in-band modulation over GSM). The link is realised by an in-band modem included in the IVS device, which has been specifically designed and standardised for eCall. This approach guarantees an EU-wide availability of prioritised and free eCall data transmission through established 112 voice call mechanisms. In the case where data is not sent nor received for any reason, the eCall continues as a normal 112 emergency call.

The eCall is received directly by a public (or under public mandate) safety answering point (PSAP). The PSAP in charge of handling eCalls may not be the same as the PSAP receiving and managing normal 112 calls. This must be defined by the responsible authorities.

M1 and N1 vehicles, i.e. passenger cars and light duty vehicles, will be equipped with the necessary technology with the same technical standards and the same quality of services objectives.

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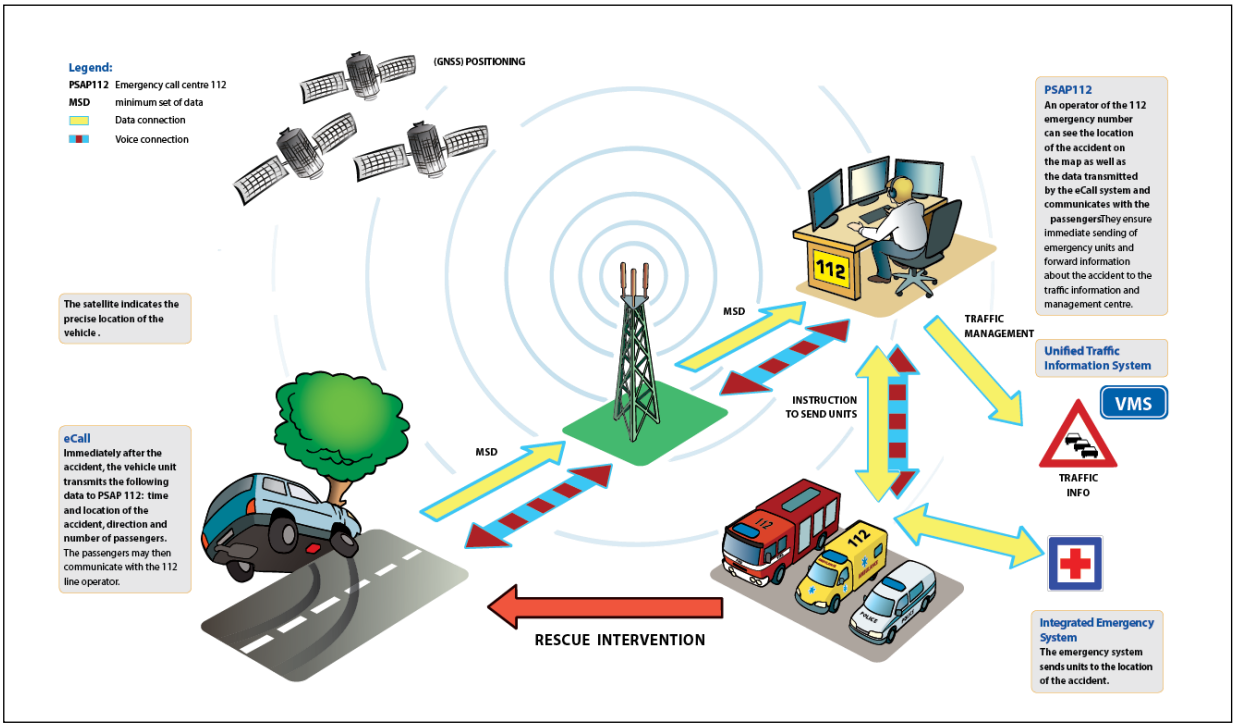

The eCall in-vehicle system is powered-up and initialised when the vehicle is started.

After the triggering of the eCall (either manually or automatically), other communications that are in progress are suspended, if needed. Microphone and loudspeakers are fully dedicated to the emergency call. The in-vehicle system alerts the occupants that an eCall message is being sent. At the same time the in-vehicle equipment connects to the network and the emergency call to 112 is established and routed to the most appropriate PSAP.

After the eCall is picked-up by the PSAP PABX system it is routed to the PSAP in-band modem and the MSD demodulated. At that moment, the PSAP has the automatic information given by the vehicle available. After this, audio link is established and the PSAP operator can hear the ambient noise and speak with the vehicle occupants, if possible. The PSAP operator may at any time request that a new MSD is sent (e.g. data appears corrupted or inconsistent, or the PSAP operator believes that the data may have changed). Once the communication with the vehicle is finished, only the PSAP can clear down the call. At all times, the in-vehicle equipment remains registered to the network to make call back possible.

The 112-based eCall concept benefits from its direct prioritised emergency link to the appropriate PSAP through the existing 112 mechanisms. The 112 call over the mobile network is required to work in all European countries for free, even if no roaming agreement between the vehicle's home network and the guest network is in place. For the 112-based eCall, the priority given to normal 112 calls in the mobile network also applies to the eCall data transmission. This maximises the coverage and availability of the eCall service. The changes required in the mobile networks are minor (eCall flag and PSAP routing tables).

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Compared to the TPS eCall, the fact that a direct link to the PSAP is established reduces the potential sources of failure in the emergency call provision. However, filtering of false emergency calls (primarily for *manual* eCalls) will have to be done directly at the PSAP.

4.2 112-based eCall service stakeholders

eCall involves several different stakeholders all with separate responsibilities and tasks. The main actors are:

- In-vehicle equipment provider(s)
- Mobile network operators (MNO)
- Telecommunication National Regulators
- Authorities (European / national / regional)
- Public safety answering points (PSAP)
- Emergency response organisations
- Citizens
- Road operators

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4.3 Minimum set of Data

The Minimum set of Data (MSD) has been standardised by the European Committee for Standardisation (CEN) (see the list of eCall standards in section 7).

In case of incident the public safety answering point (PSAP) receives a standardised set of data (Minimum set of data – MSD) including the following information (this list is not exhaustive):

- Message identifier: MSD format version (later versions to be backwards compatible with existing versions).
- Activation: whether the eCall has been manually or automatically generated
- Call type: whether the eCall is real emergency or test call
- Vehicle type: passenger Vehicle, buses and coaches, light commercial vehicles, heavy duty vehicles, motorcycles
- Vehicle identification number (VIN)
- Vehicle propulsion storage type: This is important particularly relating to fire risk and electrical power source issues (e.g. Gasoline tank, Diesel tank, Compressed natural gas (CNG), etc.)
- Time stamp: Timestamp of incident event
- Vehicle location: determined by the on-board system at the time of message generation. It is the last known vehicle's position (latitude and longitude)
- Confidence in position: this bit is to be set to "Low confidence in position" if the position is not within the limits of +/-150m with 95% confidence
- Direction: helpful to determine the carriageway vehicle was using at the moment of the incident
- Recent vehicle location n (Optional): vehicle's position in (n-1) and (n-2)
- Number of passengers (Optional): number of fastened seatbelts
- Optional additional data (Optional): in some cases, optional data may be available in the MSD (at the vehicle manufacturer discretion). These data incorporate a tag for the identification in the beginning of the optional data (type and structure identification). This data will be registered and maintained. PSAP will have free access such data registry data.

4.4 eCall Flag

Some emergency services have required a system to separate eCalls from 112 calls to route the calls differently. This is the main reason of the eCall flag implementation. The eCall flag also makes it possible to differentiate automatically and manually initiated eCalls.

The flag is part of the GSM signalling of the call triggered by the IVS. Being a GSM signalling modification, the eCall flag is lost in the passage to ISDN networks, for routing the call to the desired PSAP.

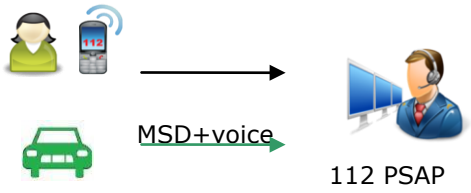
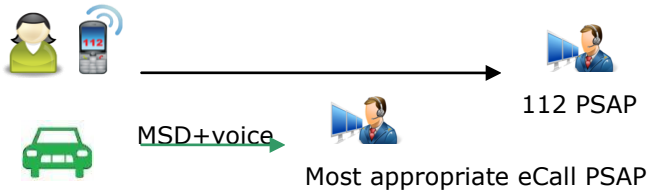
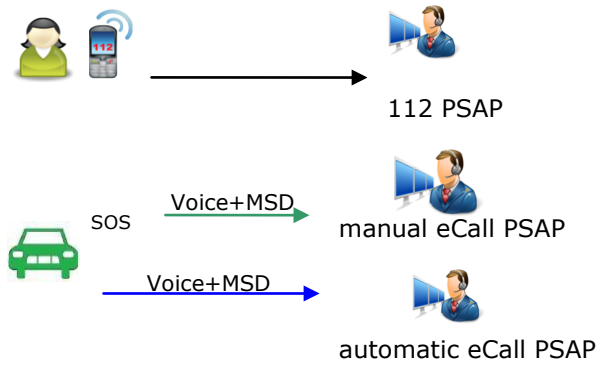
After the implementation of the eCall flag, in some PSAPs some 112 calls made from some mobile phones have been received as eCalls. This problem is called "Ghost Calls from mobile handsets" and it was discovered that it came from a bad configuration of the eCall flag at the mobile handsets.

To avoid this, the eCall flag when making an emergency call, has to be well configured. The EC committed to ensure that new mobile phones pass a specific test before being sold in the EU market.

4.5 Models

Pan European eCall can be implemented using different models. The main differences between the models are:

- All eCalls and 112 calls are routed (or not) to the same PSAP
- Manual and automatic eCalls are routed (or not) to the same PSAP

	Model I: eCalls routed as 112 calls. The most appropriate PSAP receives 112 calls and eCalls.
	Model II: all types of eCalls are routed to a dedicated PSAP only for eCalls. 112 calls continue to be routed to the 112 PSAP.
	Model III: manually triggered eCalls and automatically triggered eCalls are routed to a different PSAP (it can be the same PSAP for 112 calls, e.g. dedicated manual eCall PSAP can be the same as 112 PSAP)

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4.6 PSAP Procedures

PSAPs must develop new procedures to handle eCalls. eCalls must receive the same treatment as other 112 calls (priority, language, privacy, etc.). The call-handling is to be achieved in line with national procedures and regulation.

Nevertheless, there are special situations which PSAPs must consider, e.g. when data arrives at the PSAP but there is no voice connection or when data arrives at the PSAP and voice connection is established but nobody speaks.

Issues to consider:

- Silent calls when MSD is available (procedures could be different if it is a manual or an automatic call)
- Silent calls when MSD is not available (procedures could be different if it is a manual or an automatic call)
- Call back
- Multiple generation of manual or automatic eCalls: prioritisation of automatic eCall
- Request a new MSD (MSD pull-back)
- VIN decoding
- Management of the "No confidence in position" flag
- eCall routed to the wrong PSAP
- Forwarding the call and MSD to another PSAP
- Multilinguism
- A 112 call is received as an eCall

If the calls are not handled in the same PSAP as 112 calls, protocols to transfer the data to the 112 PSAP need to be established.

It is very important to highlight that PSAP staff needs to be trained in the eCalls procedures and software.

4.7 Technical overview

a) Telecommunication aspects

Network operators:
eCall is supported via wireless communications networks commonly implemented by European network operators. This ensures the availability of a real time secure transport mechanism that makes quasi simultaneous data transfer and voice call feasible.

SIM Card:
The in-vehicle system has a valid SIM that enables the provision of the eCall service. It is to be configured only for making an eCall, or it could also be used, in addition and as optional, for commercial service provision. In the first case, the IVS will be in a dormant mode (not traceable and active only in case of eCall triggering).

The assignment of public numbering resources to eCall SIMs and the activation of those SIMs on mobile networks is currently still not completely defined.

Identification of an event or a trigger which clearly defines the end-of-life of the vehicle and its corresponding eCall SIM is still being described.

Priority of the call:
eCall has the same priority as a 112 call.

Routing of the 112 call by the network:
Competent authorities must decide where and how eCalls have to be routed. As already mentioned, the eCall flag makes possible that eCalls are received by a different PSAP than 112 calls.
Even if eCalls and 112 calls are routed to the same PSAP, it can be decided to route them to specific call queues.

Provision of the location:
The caller (vehicle) location is provided by the MSD through GNSS coordinates. The caller location is anyway provided by MNOs like for normal 112 calls, should the MSD not reach the PSAP.

Roaming:
The in-vehicle equipment has a 112-based roaming capability as for 112.

b) PSAP technical equipment

PSAPs must adapt their equipment to be able to receive eCalls. The mandatory deadline for this system improvement was set to October 1st 2017, for all PSAP in European Member States. They need to communicate with the in-vehicle system (IVS) using an in-band modem and they have also to ensure their software to make the MSD information available for PSAP operators. Before updating the technological equipment of the PSAP, the amount of eCalls that will be handled has to be estimated.

Currently, the technical equipment of 112 PSAPs may be very different. Some European 112 PSAPs are equipped with very advanced technology and others only have very basic communication tools. It is highly recommended that PSAPs are equipped to be able to handle the location of the 112 calls automatically.

PSAPs receiving eCalls will have to be equipped with an in-band modem and have it connected to the public switched telephone network through a PABX interface.

Additionally, a PSAP receiving eCalls is required to be equipped with a software application that could either be a special eCall application or integrated within the PSAP's interface software. It should provide at least these functionalities:

- warn the operator about a new eCall
- display the minimum set of data
- decode VIN (vehicle identification number)
- warn the operator about the availability of the voice call
- provide a call-back capability
- request a new MSD (pull-back mechanism)
- hang up an eCall
- provide a geographical information system: display the location of the vehicle, direction and the last positions (if available)
- etc.

4.8 PSAPs Conformance Testing

Conformance testing of PSAPs is considered as an important part of the eCall deployment in Europe. The delegated regulation 305/2012 of the European Commission[2] states that the member states have an obligation to designate the competent authorities for assessing the conformance of PSAPs to the specifications of eCall:

"Conformity assessment Member States shall designate the authorities that are competent for assessing the conformity of the operations of the eCall PSAPs with the requirements listed in Article 3 and shall notify them to the Commission. Conformity assessment shall be based on the part of the standard 'Intelligent transport systems — eSafety — eCall end to end conformance testing' (EN 16454) that relates to PSAPs conformance to pan-European eCall." (European Commission 2013, Article 4)

The same regulation also states that the PSAPs must be able to demonstrate conformity with the European standards. The first part of article 7 of the regulation states that the conformity assessment must be based on the tests included in the related European standards EN16454 (see section 7):

"Rules on liability The eCall PSAPs must be able to demonstrate to the competent authorities that they meet all specified conformance requirements of the eCall standards listed in Article 3(1) [EN16062 and EN16072, author's own note] in respect of the part(s) of the system under their design and/or control. They shall be liable only for that part of the eCalls for which they are responsible, which starts at the time the eCalls reach the eCall PSAP, in accordance with national procedures".

Specifications of conformance tests for eCall, are published in the specification document CSN EN 16454, published in 2015.

It should be noted that also other testing than conformance assessment may be necessary to achieve a functional and high-quality eCall service. For example, it may be necessary to test the performance of the PSAP solution, its reliability and its correct operation in exceptional but possible situations (e.g. a situation with many simultaneous eCalls being received, support for all defined MSD versions, presentation of MSDs with optional additional data, etc.).

[2] European Commission. 2012. Commission delegated regulation (EU) No 305/2013 of 26 November 2012 supplementing Directive 2010/40/EU of the European Parliament and of the Council with regard to the harmonised provision for an interoperable EU-wide eCall.
http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2013:091:0001:0004:EN:PDF

4.9 National implementations

The list of National eCall management models and implementation, Country by Country is described in the EENA *"Public Safety Answering Points Global Edition"* available to EENA Members.

4. 10 Open issues with 112-based eCall

End of March 2018, there are still some issues that have not been fully addressed, yet. They have been already mentioned in previous chapters.

1) eCall flag in other devices "Ghost Calls": according to reports, non-IVS devices have been spotted to trigger eCall flags when generating emergency calls. eCall flag should be well configurate to minimise these calls, all devices generating calls have to be tested before by international organisations before being put in the market, PSAPs should consider a particular procedure to discriminate between "true" eCalls and the others.

2) Vehicle inspection/vehicle end of life: IVS, being a car component, is subject to lifecycle inspections. These inspections might generate false eCalls to be dealt with. Also, cars which have an IVS installed and are put out of circulation (demolished, etc.) might generate false eCalls to be dealt with.

3) 2G GSM network switch off: today eCalls are transmitted in-band, modulated on the GSM voice channel (that's why PSAPs require a modem to demodulate them). Most GSM MNO in Europe are planning a switchover of GSM networks, to move all communications on VoLTE technology. This will impact in general emergency communications[3], but in particular on eCalls since there will be other ways of transmitting MSD. Currently, the standard on Next Generation eCall[4] is being studied, to find a proper way of keeping the same information as in current MSD[5].

   The Internet Engineering Task Force (IETF) has published a document describing how to support eCall within the IP-based emergency services infrastructure.[6]

4) Data integration with 2nd level PSAPs: in some models of PSAPs organization, where there is interoperability between PSAPs who collect emergency calls (Call Takers) and those who are in charge of managing emergency units and rescue (Dispatchers), MSD is more valuable to the latter, as they need a proper scenario of the vehicle as they are planning rescues. Interoperability between these subjects becomes more and more important with this kind of data share. Methods of data sharing need to be implemented wherever they are non-existing or insufficient[7].

5) Configuration of the SIM cards: The assignment of public numbering resources to eCall SIMs and the activation of those SIMs on mobile networks is still not completely defined.

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[3] See references in EENA' LTD definition on NG112 http://www.eena.org/uploads/gallery/files/pdf/2013-03-15-eena_ng_longtermdefinitionupdated.pdf

[4] http://www.eena.org/download.asp?item_id=162

[5] Please check the results of I_HeERO Project annex B

[6] http://tools.ietf.org/pdf/draft-ietf-ecrit-ecall-00.pdf

[7] Again, please check the results obtained in Project I_HeERO annex B

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5 Third party services supported eCall

5.1 Overview

The term TPS eCall is used to describe a Third-Party Service Provider (TPSP) managing vehicle based emergency requests under the responsibility of that supplier.

A member state can decide to outsource the reception of 112-based eCall to a third party, but then the responsibility still lies with the member state. This situation is not meant by TPS eCall.

The proposed European regulation leaves room for the existence of TPS-eCall next to the Pan European eCall under the following conditions:

- Every new car must be equipped with the pan European eCall IVS
- A TPS provider may offer the owner of the car TPS eCall
- The owner should be informed by the TPS provider of all the consequences of the use of TPS eCall
- The owner may decide to discontinue the TPS eCall service. In that case Pan European eCall will be activated again
- Member States will choose how to structure emergency services call handling. This may or may not include private organisations/TPSP. If private organisations/TPSP are not included, Pan European eCall must be active.

Third-Party Service (TPS) eCall is based on using a third party to filter and route the calls prior to the PSAP routing. Voice call and MSD (or similar) is transmitted to the TPSP Call Centre using two channel communication methodology usually leveraging SMS technology and in-vehicle satellite positioning technology. The calls are received by call centre agents (TPSP operators) and handled accordingly of the type of the call (emergency call, breakdown call, etc.). In case of emergency, the TPSP operator will transmit both voice and data to the appropriate PSAP with jurisdiction at the site of the emergency (if long numbers of this PSAP is available to the TPSP operator).

In case of emergency:

- The vehicle calls the TPS centre, making a normal call (not treated as an emergency call by the mobile network operator) and sends the MSD or similar information (GNSS position, vehicle identification and sensor information if available).
- The data is analysed, treated and, if possible, enhanced by the Telematic service provider, generating a "TSD" (TPS-MSD).
- The responsible PSAP will be identified and called via the long numbers; the incident information is then exchanged through a voice conversation or other means if available; Conference Bridge with the driver will be activated if requested by the PSAP operator or the vehicle occupant(s). Procedures and interfaces for the transmission of the enhanced incident data (if different from the pure MSD) will have to be agreed between the third-party service providers and the PSAPs in each EU Member States.

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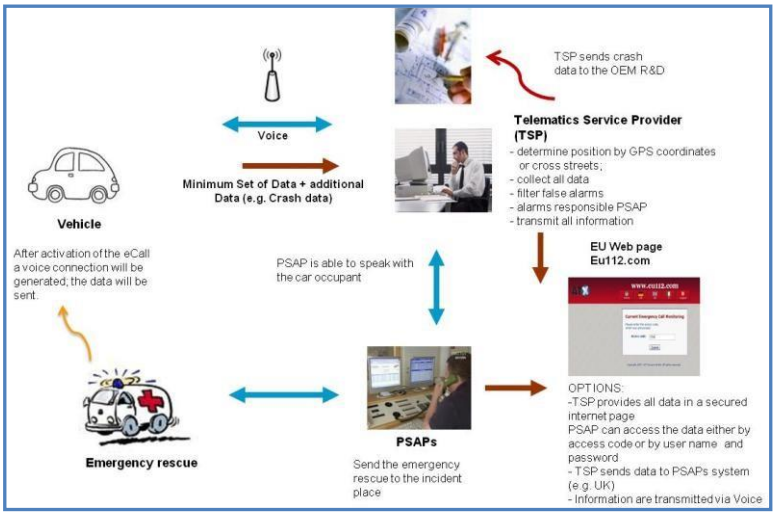

The following table shows in brief the main differences between Pan European and TPS- eCall

	Pan European eCall	**TPS eCall**
Purpose/service	Only emergency calls	Combined with other value-added services (ie track and trace, B-call)
Mandatory	Yes (automatic and manual)	No, optional
Type of communication	Voice + MSD, in band	Voice + MSD, service provider specific
Destination	PSAP, fixed in national routing schemes MNOs must implement (national law)	Private answering point; TPS specific
Data	Only MSD according to standards	MSD and additional data (not yet standardised); TPS specific
Priority	Handled as normal 112 emergency call with priority in the networks	Call has no priority in the networks
Traceability	Only when eCall-message is triggered	Dependent on agreement customer/TPSP

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5.2 Operational procedures and agreements for communication between PSAP and TPSP

TPSPs need to reach an agreement with each MS where they want to provide their services. It is worth mentioning that MS do not have any obligation to accept TPS eCall.
This agreement must be clear on what are the responsibilities of each partner. This clarification needs to be available for the customers.

The general principle will be that the actors are responsible for the part of the action chain for which they provide the service.

- It will be for the TPSP to ensure that data from the vehicle is received and dealt with in a proper way, and that the audio link is functioning properly. They will also be responsible that the handling of the incident, including the decision on whether the handling of the incident is transferred to the PSAP, is in line with the agreement between TPSP and the MS.
- It is the responsibility of the national authorities to decide to where TPS calls are to be routed, what the communication links are, how the links are activated etc.
- The PSAP will be responsible for being able to take over the handling of the incident, in line with pre-set procedures. Once the data and voice channel has reached the PSAP, it's up to them to handle the incident in line with their general procedures.

In addition to the service meeting the requirements of EN 16102, MSs may set their own requirements. It is however expected that most MSs will use the same or similar requirements. It is strongly recommended to set up a common list of requirements with the possibility for each MS to add a few specific requirements

It has also to be established:

- The conditions under which a member state is willing to accept TPS eCall
- How the communication between PSAP and TPSP should take place
- The boundaries of the jurisdiction of the PSAPs in each EU member states, and how to contact them.
- Areas of responsibility in case of loss of communication between the PSAP and the TPSP

A private company that provides non-emergency telematics services to their customers may receive emergency calls if the customer uses the non-emergency connection. Private companies that do not provide Third party services supported eCall, may still need boundaries and long numbers to contact a PSAP in this instance.
On these purposes, EENA published in 2015 a template document that tries to address all the requirements for setting up an agreement between the parties.[8]

EENA has developed this unique Standard to improve the overall provision of TPS eCall across the EU for our citizens. The programme will allow for the first time eCall TPSPs to benchmark themselves against a Standard which is specific to their mission. The Standard will reward those exemplar providers who have been committed to provide a high quality eCall service.[9]

[8] http://www.eena.org/download.asp?item_id=120
[9] http://www.eena.org/pages/tpsp-ecall-certification#.Wrtn1y5ubX4

5.3 Technical communication with PSAPs

Today there are different alternatives:

- Voice
- Web service data push interface described in CEN EN 16102
- Integrated interface in the PSAP software
- A web-based interface which works independently from the PSAP infrastructure and which required a minimum equipment at PSAP (Pc, internet access). This last standard has been addressed through the EU funded project I_HeERO, concluded in December 2017 and addresses the transfer of data through the open source protocol "CAP". The proposal is currently being evaluated by CEN as an extension to the EN 16102 document.

Whereas the organisational and administrative needs are clear and ready to be dealt with, more work is needed on the technical side. Standardisation on how to present and forward the MSD and additional information is required.

6 Recommendation to stakeholders

6.1 Pan European eCall

Stakeholder	Action
European Authorities	Defined completely the open issues: • Ghost calls tests to non eCall devices • Numbering and SIM Card solution definition • 2G and 3G non-availability • Vehicle inspection/vehicle end of life
National Government	112-based eCall implemented
National Telecommunications regulatory authority (NTRA)	Checking that all legal requirements are complied, eCall flag issues SIM Cards solution Car end of life
Mobile network operators	Implement the eCall flag Treat eCalls as 112 emergency calls (free of charge, priority, national roaming, etc.) Providing the right routing based on eCall flag following the instructions of the National Authorities Providing SIM cards for the IVS (based on commercial agreements)
Competent Authorities of Emergency Services	Make sure that emergency services have the necessary means (including budget) to adapt their systems to eCall Solve multi-languages cases Define the data integration with 2nd level PSAPs
Emergency services and their providers (e.g. Software Provider)	• Infrastructure set-up (e.g. integrate eCall into the PSAP systems) • Verify that eCall information is correctly received • Training of operational and technical staff • Establishment of operational protocols
Car Industry and their suppliers	Equip vehicles with eCall following the relevant EU Regulations Ensure the functionality of the in-vehicle system Comply with EU Regulations on data protection and free consumer choice

6.2 Third Party Services supported eCall

Stakeholder	Action
National Government	Regulating the co-existence of TPSP based solutions, today present on the European market *[this is not mandatory for Member States]*
Mobile network operators	Providing SIM cards for the IVS (based on commercial agreements)
TPSP	Provide appropriate number of call centres and trained operators available 24/7 Creation of a PSAP database Quality certification Work with PSAPs to establish protocols to communicate with PSAPs Establishment of protocols to communicate with PSAPs (if the PSAPs agree) Establishment of a Multi-language system Filtering of false alarms (Call Center based services) Development of an interface which offers a safe way to transmit detailed crash data to PSAPs (if PSAPs agree): • Clear and structured data transmission • Exact and detailed location description (address, map, coordinates) • Vehicle information (car model, color, number plate) • Sensors data visualisation (by automatic eCall) • Multiple languages
Competent Authorities of Emergency Services	No specific equipment needed. TPSP will adapt its equipment to the needs of PSAPs (if PSAPs agree)
Emergency services and their providers (e.g. Software Providers)	• Establishment of operational protocols • Training of operational and technical staff
Car Industry and their suppliers	Ensure the functionality of the in-vehicle system Comply with EU Regulations on data protection and free consumer choice

EENA asbl
info@eena.org - www.eena.org

Annex A: Table of relevant applicable standards[10]

In this paragraph the relevant applicable standards are listed. Updated versions of the documents are available through the standards bodies in each Member State. The communications standards can be obtained through ETSI using the following link[11]

Pan-European eCall Operating Requirements – (PEOR)	CEN EN 16072
eCall High Level Application Protocols (HLAP)	CEN EN 16062
Third party services supported eCall –Operating requirements	CEN EN 16102
eCall Minimum Set of Data	CEN EN 15722
eCall end to end conformance testing	CSN EN 16454
eCall Operating requirements for third party support	CSN EN 16102
eCall requirements for data transmission	3GPP TS 22.101 ETSI TS 122 101
eCall Discriminator Table 10.5.135d	3GPP TS 24.008 ETSI TS 124 008
eCall Data Transfer – General Description	3GPP TS 26.267 ETSI TS 126 267
eCall Data Transfer – ANSI-C Reference Code	3GPP TS 26.268 ETSI TS 126 268
eCall Data Transfer – Conformance Testing	3GPP TS 26.269 ETSI TS 126 269
eCall Data Transfer – Characterisation Report	3GPP TS 26.969 ETSI TS 126 969
eCall Data Transfer – Technical Report - Characterisation Report	3GPP TR 26.969 ETSI TR 126 969
Data registry procedures	ISO/EN 24978:2009

[10] HeERO 112: List of Standards related to 112-based eCall http://www.heero-pilot.eu/ressource/static/files/ecall_table_of_standards.pdf

[11] www.etsi.org/standards-search?page=1&search=eCall&matchall=true&matchany=false&matchexact=true&title=true&keywords=true&ed=true&versions=false

Annex B: The Harmonised eCall European Pilot Project (HeERO)

HeERO pre-deployment, co-funded by the European Commission, addressed the 112-based in-vehicle emergency call service "eCall" based on 112. It is being conducted in 3 phases: HeERO 1, HeERO 2[12] and I-HeERO[13] (Infrastructure Harmonised eCall European Pilot).

The achievements of this project:

- Prepare the necessary PSAP infrastructure
- Boost Member States investment in the PSAP infrastructure and interoperability of service
- Prepare for deployment for eCall for HGV (including Dangerous Goods), Buses and Coaches
- Prepare eCall for Powered two wheeled vehicles
- Define and then perform PSAP Conformity Assessments
- Look at management of data and next generation 112
- Provide Associate Partnership

[12] HeERO project website: http://www.heero-pilot.eu/view/en/index.html
[13] https://iheero.eu/