EENA Operations Document

Mobile Handset Requirements

Communication to Emergency services

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1 Executive Summary

Handset manufacturers, Mobile network operators and other actors in the telecom market are important players in helping emergency actors quickly getting the best and most relevant information as possible when someone calls an emergency number. Such information could be the location of the caller or medical data which could prove vital.

There is also a need for emergency services to send data to the public and the mobile phone – the handset – is a suitable channel of communicating for example public warnings to the public since the information can be more specific than for example from a siren on a rooftop. And of course, "everyone" has a handset nowadays.

The possibilities with handsets are vast, and therefore emergency services and EENA hopes for a good, continuous dialogue and cooperation with handset manufacturers, mobile network operators, suppliers of mobile operational systems and other telecom actors to turn possibilities in to real action. It is also important that national governments and their regulatory authorities within the telecom sector updates regulations in pace with development of telecom technology.

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2 Introduction

The telecom market is developing rapidly. Nowadays ”everyone” has not only a mobile phone device in his/her pocket or handbag, but a smartphone; in fact a computer filled with advanced functions, many of which are aimed at communicating by text message, chat and/or pictures, or at the gaming market. But we must not forget that the mobile device also is an important instrument in getting in touch with the emergency services and should be able to deliver more than just voice in emergency situations.

This document will use the term “handset”, which means a mobile device in form of a mobile (cell) telephone which communicates through a wireless network, supplied by a Mobile network operator (MNO) or a tablet, wrist watch, or similar with the same functions. The fixed landline is more and more replaced by mobile telephony and the larger part of calls to 112 (or equivalent emergency numbers) are made through mobile networks. This means a higher availability when emergencies (accidents, illnesses, thefts, etc.) happen outside our homes, but on the other hand the location, surprisingly, is not as precise as when the emergency call is made from home where the Emergency call center - the PSAP (Public Safety Answering Point) - can easily locate the address.

Mobile telephony gives several opportunities for a more efficient help in emergencies and the actors involved need to detect and develop these possibilities.

Concerned actors

There are several actors which are most important for developing and implementing functions to simplify and enhance the information from the caller to PSAP in an emergency:

- The handset manufacturer; the producer of the hardware
- The supplier of the operational system; the software
- Mobile network operator, the MNO´s, who supplies the channel for communication
- Developers and suppliers of web-based applications in the handset; the apps

The faster the PSAP gets information from the caller, the richer this info is, and the more automated this process is, could be crucial in getting the right resources to the right place as quickly as possible to save lives, property or the environment.

This document aims to give a PSAP perspective on the possibilities that the smartphone gives, to give feedback on what is important for PSAPs and hopefully bring some ideas on future development to the mobile phone industry.

Defining “emergency”

The definition is broad and covers everything from heart attacks, ongoing crimes, road accidents, to plane crashes, natural disasters and terror attacks. Regardless of emergency, the common denominator is the need to get in contact with a PSAP in order to get help and advice. The person who calls 112 can be the one in need of help or calling for another person in need of help, alongside of this person or far away, or a witness to an emergency.

If the person in need of help is the one calling, he/she can be in different situations; lost in a forest or on a mountain, in a sinking boat at sea, in a burning house or a crashed car, or having trouble to breathe, losing consciousness, be in severe pain or being robbed or beaten. The caller can be deaf, speaking a foreign language or being unable to speak at all. Regardless of this or kind of emergency, the PSAP has to handle the case in a most efficient way, and the handset can be a great help in this.

It is important to stress that a PSAP is always striving after verified information. Only if a PSAP gets verified information we can send the right resources to the right place and help the right person(s). And also be sure that an emergency really has occurred and that this is not a prank call.

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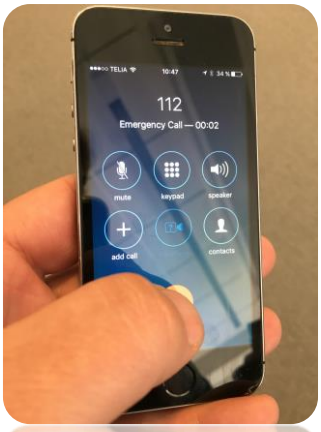
PSAP needs

The two basic questions that the PSAPs needs a quick answer to when an emergency call is made are:

- WHAT has happened, and
- WHERE this has happened



If the mobile device or MNO can assist the PSAP with swift and correct data, for example a reliable location by GPS, this can shorten the interview and enable a quicker dispatch of resources. Swiftness saves lives!

Every piece of information that can help is also of benefit, for example the name of the owner of the mobile, language spoken, known diseases (in case of sickness), and of course the telephone number.

Standards and regulations

All mobile manufacturers should use common standards, as far as possible, both for the caller who might change handset in every three years or so, and the PSAP who needs to be able to receive and interpret the data.

The EU and national telecommunication regulators should also do their part in making sure that the laws and regulations are up to date and keeps in pace with the rapid development in the telecommunications market. Another key task is to regulate where the telecom industry in itself fails to meet the expectations of the public and the PSAPs.

It is important to underline that the PSAP organizations and EENA are more than willing to give input and meet MNOs, mobile manufacturers and suppliers of operating systems. Cooperation is important to ensure that the public gets the best help possible in emergency situations! Safety is a selling point in the car industry and should be same to the mobile phone industry.

When it comes to app developers and suppliers, it is important to remember to follow standards and that an app should be fully working even outside your own country. Otherwise it is not of any use in our globalized world. How to achieve this can be read in the following EENA documents:

- 112 Apps Strategy[1]
- Pan-European Mobile Emergency Application (PEMEA) Requirements and Functional Architecture[2]
- PEMEA Protocol and Procedures Specification[3]
- PEMEA Approval Procedure[4]

[1] http://www.eena.org/download.asp?item_id=96
[2] http://www.eena.org/download.asp?item_id=158
[3] http://www.eena.org/download.asp?item_id=175
[4] http://www.eena.org/download.asp?item_id=185

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3 Requirements for handset manufacturers

The following sections provide a list or requirements structured by topics that are relevant to Emergency Services.

3.1 Protection against "pocket calls"

Sadly, a lot of the calls to emergency numbers are not really concerning real emergencies. Many of them are from people dialing the wrong number, aware or unaware of it, not knowing which number to call in a non-emergency to reach for example the police or health care advice, or silent calls, also known as "pocket calls". If the PSAPs could identify and verify the real emergency calls from non-emergencies, it would mean that valuable time and effort would be saved.

An often vast number of the pocket-calls are silent calls which means that there is no one to talk to. It is either silent, someone has hung up (or not), or the PSAP operator can hear noises, for example of people talking to each other, footsteps or similar. There is probably a number of such calls made from people who is turning unconscious just before the PSAP answers their emergency call or unable to speak for some other reason; being under threat or suffering from cerebral hemorrhage.

The vast number of silent call makes it impossible to call back.

Moreover, to handle pocket calls takes time; the PSAP operator must make sure that there is no one in need of help. This might affect the answering time of other emergency calls.

A function that would allow the caller who is unable to speak to alert the PSAP call taker that the emergency call is real would be desirable. In the United Kingdom you can press the digit 5 two times (5, 5) which alerts the call taker and the measure to this is that the police is listening to the call to try and identify what kind of emergency that is ongoing[5].

A further development of this would be an ability to chat in real time through text with the call taker, which effectively would could give information to the PSAP without necessary talking.

Requirements to reduce the number of non-emergency calls to 112
The keypad should be locked after a number of seconds (5, 10?) after it has been unlocked if SEND key is not used within this period to prevent the handset of accidentally making a pocket call to 112.
Network filters if extra digits are received after the emergency number (which are taken as indication of accidental pressing of the handset) and does not connect to the PSAP.
No "quick-buttons" or other functions (like pressing a button on the handset several times) to dial 112 other than using the key pad (a possible exception to this would be a well-working voice guided assistance).

Read more about pocket calls in the EENA Operations Document "False emergency calls[6]".

3.2 Easy to call emergency services

It should be easy to find the telephone pad to dial 112, and to dial 112 even if the key pad is locked (no need to enter the keylock code).

As previously mentioned, there are a many pocket calls to 112. That it is possible to call 112 without entering the code is most likely responsible for many pocket calls to 112, but the fact

5 https://www.ipcc.gov.uk/sites/default/files/Documents/investigation_commissioner_reports/Appendix%20B%20-%20Investigator%20report%20-%20Silent%20Solution.pdf

6 http://www.eena.org/uploads/gallery/files/operations_documents/2012_05_04_falseemergencycalls.pdf

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that almost every mobile device today has a display instead of buttons should reduce such calls to a minimum.

Manufacturers should therefore see to that it is easy to dial 112 with intention, but prevent that unnecessary calls to 112 are made unintentionally.

Requirements to make calling emergency services easy:
Manufacturers should make the keypad accessible to dial 112 even if the keypad is locked
Facilitate access to emergency calling using voice-guided assistance

3.3 Automatically generated emergency calls

Self-monitoring healthcare wearable devices are upcoming and it is no qualified guess that they will be a future source of information to the PSAP. Body temperature, pulse, oxygenation and blood glucose are some of the data that could be very useful in the task to evaluate and prioritize a patient´s need of ambulance.

Other sensors might also be connected through a handset to the PSAP.

Further development might involve sensors themselves generating an alarm to the emergency number when for example the wearable detects a sudden change in health.

It is then important for the PSAP to rely on the accuracy of such devices, partly because of the need of correct data to make a correct evaluation and give the right priority and medical advice, but also because a malfunctioning sensor could result in an unnecessary rescue effort.

Requirements related to automatically generated emergency calls:
Manufacturers should be aware of the benefit for PSAPs that sensors can offer, but also of the need to qualify and verify

3.4 Location provision

As previously mentioned the "WHERE" is of most importance - to locate the exact spot where the emergency is taking place.

Requirements for caller location:
PSAPs should always have access to the most reliable and exact method of location. These could for example be in form of: • GPS • A-GPS (Assisted GPS) • WiFi • Cell-id

3.4.1 Network based location

MNO´s usually delivers the network-based positioning method of a cell-id based on GSM-Cell's geographic position which is used to calculate the position of a handset out of this data. This is presented to the call taker as an area, a sector, where the size of this area varies depends on how high the density of the cell net is. In rural areas, one cell sometimes covers areas of tens of kilometers, while in cities one cell sometimes covers down to hundreds of meters.

Because GSM network cells sometimes has very wide coverage, the location is very inaccurate. The caller´s position sometimes even proves to be outside of the area[7].

[7] https://www.snet.tu-berlin.de/fileadmin/fg220/courses/WS1011/snet-project/wifi-cellid-positioning_willaredt.pdf

There is therefore a need of developing this technique further to be more refined to be useful to PSAPs.

3.4.2 Handset based location

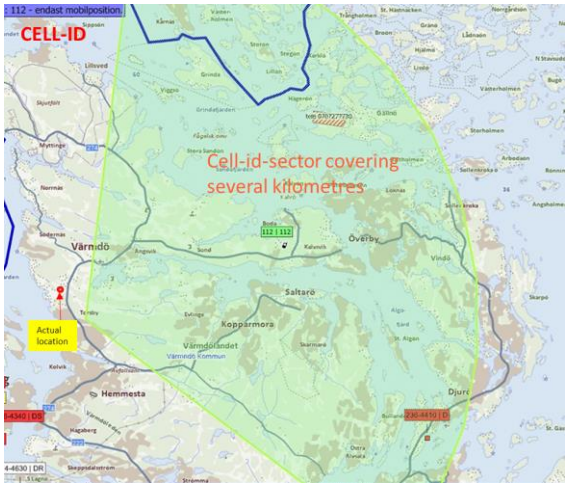
Since 2014 a solution developed in the United Kingdom called AML[8] (Advanced Mobile Location) has been tried and found successful. In this, it is the handset itself that delivers a location in form of a GPS-location, or if not GPS available, a Wifi based location, or if no Wifi based location available, the cell-id. The location is sent through a SMS or HTTPS post.

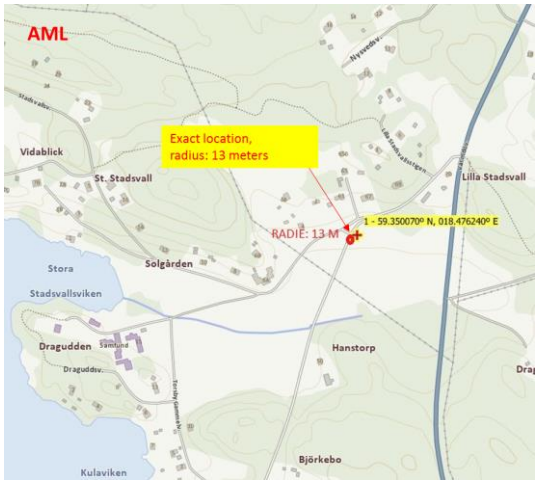
The AML has since been implemented in several countries and is on its way in several others. In 2016 Google introduced their solution called ELS (Android Emergency Location Service[9]) which works in a similar way as AML on all android handsets (smartphones). Hopefully, also Apple will pick up on this initiative in their IOS system to ensure that all emergency calls will deliver a more exact location to PSAPs.

Read more about AML in the EENA documents:

- AML FAQ[10];
- AML Specifications & Requirements[11];
- AML Additional Requirements for Mobile Handset Manufacturers and Mobile Network Operators[12];

Pictures down shows cell-id compared to AML location (GPS) from AML tests made in Sweden.





Also see EENAs document Handset Derived Location for Emergency Calls[13] for more information.

Requirements for handset based location:
Handset manufacturers should see to it that their handsets are AML compatible.
Apple should see to it that an AML function is introduced in IOS.

[8] http://www.eena.org/pages/aml#.WLguHzvhCUk

[9] https://blog.google/topics/google-europe/helping-emergency-services-find-you/ o

[10] http://www.eena.org/download.asp?item_id=209

[11] http://www.eena.org/download.asp?item_id=165

[12] http://www.eena.org/publications/aml-requirements-2#.WLRPxDvhCUk

[13] http://www.eena.org/download.asp?item_id=98

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3.4.3 More on location

A location is usually delivered to the PSAP in form of an X and a Y coordinate. A "Z" coordinate if possible could be of great value in certain cases, for example when a caller goes unconscious during an emergency call and is in an apartment.

In other cases it would be helpful if the caller could write a position in a map on the handset. For example; a caller sees a fire in woods several kilometers away and can specify the estimated point of the fire by putting a manual location in the map, or the direction of the fire by pointing in the map, or saying what point of compass, from his own location. The ability to write or point in the map and transfer this to the PSAP would be of great help in certain cases, probably mostly in rural environment, and also to see a compass integrated with the map.

3.5 Identifying the caller

Requirements for caller / handset identification:
PSAPs need to receive a caller/handset identification for traceability purposes: CLI, IMEI, IMSI

3.5.1 Caller Line Identification (CLI) Callback

It is important that the PSAP has access to information on the caller to 112, so they can call back in case of interrupted call. Caller line identification (CLI) should always be available for this reason. This also includes cash cards.

In most countries it is voluntarily to register the identity of the user, while in Spain and other countries it is mandatory to register all prepaid SIMcards[14] (in Spain, since 2009 a name and an ID needs to be linked to every prepaid SIMcard; this was decided after the Madrid terrorist bombings in 2004).

3.5.2 Availability of IMEI (International Mobile Equipment Identity)

An IMEI is a 15-digit number containing information on the origin, model and serial number of the mobile device. The IMEI number is used by a GSM network to identify valid devices and can therefore be used for stopping a stolen phone from accessing that network. If a handset is stolen, the owner can block the phone from being used with the help of his/her network provider using its IMEI number.

Emergency numbers can though be reached even if the phone is blocked. This should not be the case – why should a blocked handset be able to call 112 when it is useless to call any other number? There are cases where 112 calls are made for malicious purposes, for example to make false alarms or to spam or in worst case, to perform a TDoS attack to overload the emergency number.

Note also that the phone used for this purpose could be a handset without SIM-card. Many countries allow handsets to call 112 without SIM-card installed.

MNO´s should therefore see to it that no calls are allowed from a blocked phone, not even calls to emergency numbers and to have routines in place for blocking a handset when this is required by a PSAP.

[14] http://www.gsma.com/latinamerica/wp-content/uploads/2014/06/GSMA_White-Paper_Registro-UsuariosPrepagos.pdf

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3.5.3 Availability of IMSI (International Mobile Subscriber Identity)

The International Mobile Subscriber Identity (IMSI)[15] number is a unique identifying number that is stored in the SIM-card on each mobile telephone in the GSM- and UMTS-networks. Many network and security features are enabled by knowing the current device being used by a subscriber.

The IMSI could be used by PSAPs for identifying an owner of the handset in case where a caller line identification is not available.

3.6 Emergency data available in the handset

Requirements about data registered by the owner of the handset:
Manufacturers should allow for emergency data registered in the handset to be available for PSAP after calling 112s.

3.6.1 ICE (In Case of Emergency)

The concept of ICE[16] started in 2004 from an idea of a paramedic. It is basically an idea to give rescue personnel a phone number to your next of kin, a friend, or another person you would like the rescuers to call in case of you having an emergency. You simply enter contacts in your mobile phone address book under the name "ICE", or multiple contacts as "ICE1", "ICE2", etc.

The problem is that many mobile phone are locked because of security reasons, thereby hindering first responders to access the ICE phone list entry. The user can get around this by taking a screenshot of the ICE contacts to continuously present them on the display.

But the problem is better solved if the handset manufacturers could provide a possibility for some text to be displayed while the mobile is in the locked state, such as an ICE contact, or provide access to a list of ICE contacts from the "locked" screen (which reportedly several manufacturers already provides).

3.6.2 Registered data

A valuable source of information to the PSAP could be data registered by the owner of the handset. This could be medical data (known medical conditions, allergies, etc.), data about disabilities (deaf, confined to wheelchair, blind, etc.), data about the household (number of persons, pets, dangerous goods in the house, etc.) or other data that could be useful to police, fire fighters or ambulance crew.

When calling 112 this data should be available to the PSAP operator.

A similar application is used in the USA, called Smart 9-1-1[17]. IOS devices also allow users to create an 'emergency card' in the Health application which shows an emergency contact and selected medical information (such as medications taken and allergies) and is accessible from the lock screen.

For instance, the Health application for iOS devices allows users to create an 'emergency card' which shows an emergency contact and selected medical information (such as medications taken and allergies) and is accessible from the lock screen.

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[15] https://en.wikipedia.org/wiki/International_mobile_subscriber_identity

[16] http://incaseofemergency.org/
https://en.wikipedia.org/wiki/In_Case_of_Emergency
http://www.nbcnews.com/tech/security/israeli-sos-apps-launched-wake-recent-kidnappings-n140631

[17] https://safety.smart911.com/

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3.7 Public warning

The handset should also be able to receive data from public warnings, as in case of immediate danger it is important to quickly reach people within the affected area. Since almost everyone seems to carry a handset with them, this should be a more efficient way of reaching out than sirens and messages on radio and TV.

The government in the Netherlands[18] has established that a public warning system should be real-time to ensure that the public can be alerted to a disaster as it happens, and public warning through the handset should meet up to this.

The public warning systems by handset is either location based SMS or Cell Broadcast:

- Location-based SMS allows notification to evacuate or other communication to be sent to large groups of people within any given geographical area.
- Cell Broadcast is capable of broadcasting one single message to reach all mobile handsets in any given area. Cell Broadcast only requires radio functionality activated on a mobile phone to receive messages.

ETSI (the European Telecommunications Standards Institute) specifies this in their Technical Report TR 102 850 V1.1.1 (2010-08) on Emergency Communications (EMTEL); Analysis of Mobile Device Functionality for PWS compile a series of requirements for handsets[19].

Requirements on public warning:
Handset manufacturers should take public warning functions into consideration when developing handsets.
An emergency alert message should be immediately recognizable (emergency messages shall be specifically recognizable as being an emergency message that cannot be mistaken for an ordinary message.)
The emergency warning message should stay on the display regardless of the user setting, until the message indication is cancelled by the user. It shall be possible for the user to review the message at a later time.
Battery life of the PWS-UE [the handset] shall not be significantly reduced by PWS [Public Warning System].

3.8 Optimized mobile coverage

It goes without saying the mobile coverage is important. Accidents or sickness happen anywhere, not only in cities but in the country side, at sea, in the mountains, and in the woods. To have an antenna with a good reception is one factor, good mobile coverage through your MNO is another, and the ability to roam to another MNO if your own doesn´t have coverage is yet another.

Requirements on mobile coverage:
The MNO´s should strive for coverage also in non-urban / rural areas.

[18] http://www.umsalert.com/wp-content/uploads/2015/11/CUC_Netherland_web-LR.pdf

[19] http://www.etsi.org/deliver/etsi_tr/102800_102899/102850/01.01.01_60/tr_102850v010101p.pdf

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3.9 Next Generation 112 / Total Conversation standard

Many PSAPs are preparing for Next generation 112 (NG112) – where pictures and videos might be a part of an emergency call.

To be ready to handle this the handset should be able to communicate with a standard called Total Conversation (TC) which basically provides a multi-media call service, with simultaneous video, voice and text service (RTT, Real Time Text). This means that two or more persons can communicate through several media at the same time and is therefore ideal for communication between a person that is deaf or hard of hearing and a PSAP. A sign interpreter can also be part of the conversation and be the link between the parts in real time. But of course TC can be used by anyone.

TC is an ITU standard[20] (ITU is the United Nations specialized agency for information and communication technologies).

Requirements concerning accessibility:
It is important that handset manufacturers use Total Conversation standard on handsets.

3.9.1 Chat/RTT

As mentioned earlier, there are situations where a caller can be under threat and therefore is unable to speak freely to a 112 operator. An alternative way of communicating should be through a chat in real time /Real-Time-Text or RTT) with the PSAP call taker. A voice connection is established between the caller and the call taker which allows the call taker to hear what is going on, for example shots or the voices of the culprit(s). At the same time the call taker can interview the caller by chatting.

3.10 Emergency Apps

Functions/applications should preferably be added as basic applications in the handset itself, instead of in an app. There are a lot of 112 apps out there, but they are often simple usually only presents a quick-button to call 112, and sometimes location coordinates. Some of the official 112 apps enclose the location with the 112 call, but only if you call through the app. A common experience is that when the public really needs to call 112 in an emergency, they tend not to use the app but dial the emergency number on the key pad. Maybe it is forgotten that you have a 112 app, maybe it is too complicated to find it in this stressful situation, or maybe you even did not download a 112 app at all. But since the location is so fundamentally important, the location function in emergencies should be integrated in the handset.

Read more about apps in the EENA documents on PEMEA strategy, and others like the 112 Smartphones Apps[21];

Requirements concerning emergency apps:
It is important that app manufacturers and handset / mobile OS manufacturers are aligned in the provision of public safety capabilities.

[20] The **Total Conversation** (TC) standard was defined in ITU-T recommendation F.703 as "an audio-visual conversation service providing bidirectional symmetric real-time transfer of motion video, text and voice between users in two or more locations. http://www.itu.int/rec/T-REC-F.703-200011-I/en
The ETSI TS 101 470 specification by EMTEL describes conditions for using TC for ES and makes access of emergency services possible to people with disabilities. IMS as well as IETF SIP implementations are covered.
http://www.etsi.org/deliver/etsi_ts/101400_101499/101470/01.01.01_60/ts_101470v010101p.pdf

[21] http://www.eena.org/uploads/gallery/files/operations_documents/2014_02_25_112smartphoneapps.pdf

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3.11 Privacy issues

Privacy is of course very important. And often the need of privacy collides with the PSAP and first responders need to receive as much information as possible, as quick as possible and preferably as automated as possible.

This document does not cover possible legal obstacles in using some of the proposed functions. While the smartphone technology is developing rapidly, laws and regulations are often outdated and not adapted to new circumstances. It is therefore important that regulatory authorities keep up the pace with technology so that regulations are updated constantly.

Requirements concerning privacy:
Laws and regulations concerning privacy need to have specific provisions for emergency situations.
Data protection legislation needs to keep up with rapidly changing mobile technology.

3.12 International roaming

MNO`s should see to it that information about non-emergency numbers are automatically delivered by the SMS that gives info about call taxes and emergency number 112 when entering a foreign country (see examples below of messages received by a Spanish Vodafone client when entering Denmark, Germany and Austria).

The handset manufacturer should see to it that information about EU common numbers are inserted by default in the handset´s phone book, for example the EU common 116-serie (like 116 000, hotline for Missing Children) and of course 112.

Another issue concerning international roaming is linked to Advanced Mobile Location aspects described before; to make AML work with SMS outside the country where the handset originally is registered can be to send a hidden Data SMS with new emergency communication related configuration data (i.e. the address of the AML server to receive the Location SMS), that the handset could recognise. This would also apply to current and more advanced mobile emergency communication features built into the mobile OS, which could be configured dynamically when roaming in order to adapt to the given in-country situation.

Requirements concerning international roaming:
Handset manufacturers and MNOs need to have provisions to allow mobile emergency communication features be available while roaming.

3.13 Language identifier

When you use your new handset for the first time, your handset will ask you to set preferred language, this is a basic setting. If this data could be transferred with the emergency call to the PSAP, it gives opportunity to steer the call to a specified call taker with language skills or to establish a three-party conference with an interpreter.

Requirements concerning languages:
PSAPs should be able to obtain from the handset basic language identification.

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3.14 Additional considerations

3.14.1 Alert by light and sound

A function which emits a powerful sound and/or a blinking light (maybe in form of a S.O.S Morse code; … --- …) could be helpful in cases where rescue services are looking for people lost in a forest, on a mountain or trapped in a car that has driven off road and now are hidden besides the road. It could maybe also be useful in case of an attack, for example from a rapist, robber or a kidnapper, to scare off or startle the culprit. Once the function is activated it should trigger the front camera so that a photo of the attacker is taken.

This function should not be too easy to activate by mistake.

3.14.2 Battery life

If someone calls 112, the handset should direct power only to functions and applications necessary for communicating with the PSAP. The handset should also go into power save mode if 112 is dialled and the battery power is low (closing apps etc.) to focus the remaining power on the call.

3.14.3 PSAP having the possibility to interrupt ongoing call

A function where the PSAP in some cases could interrupt an ongoing call would be valuable. This could be important if a person in need of help calls to another person, who in turn calls the emergency number to get help. This happens regularly.

The PSAP is always anxious to get a first-hand contact with the person in need of help. This can be to evaluate the case, get necessary details and to give medical or other advice. But often the line is occupied, and the PSAP-operator faces the choice of sending help with maybe vague information about the case, or repeatedly try to reach the person again.

3.14.4 Issues with wrongly assigned eCall flags

It has been discovered that calls from certain handsets are recognized by the networks as a "faux" eCall, i.e. an emergency call with enclosed data, automatically or manually triggered, from a car.

Requirements concerning wrongly assigned eCall flags:
Handset manufacturers must see to it that calls to emergency numbers are recognized as a regular emergency call and not an eCall.

3.14.5 Augmented reality

What the future handset technology has in store for us is hard to see. But "augmented reality" or AR is on its way. When used in the context of computer technology AR refers to what we perceive through our senses (usually sight) enhanced through the use of computer-generated sensory input such as sound, video, graphics and GPS data. It makes more information available for users by combining computer data to what we see in real life. With the camera on the smartphone, you can point it somewhere 'live' to get an information overlay.
If you have no idea of the address for an emergency, this could help you to identify this by recognizing buildings, bridges or other man-made structures, or formations in the nature, the profile of a mountain or example.

Today the primary limitations are the limited recognition accuracy for 'live' views – there technology is not ready yet. For AR to work seamlessly and reliably, the technology for recognizing places must be of a certain standard.

4 EENA Requirements and Recommendations

The previous chapters of this document contain many requirements linked with mobile handsets. Here is a summary of the most relevant ones:

- **Requirements to reduce the number of non-emergency calls to 112**
- **Requirements to make calling emergency services easy**
- **Requirements related to automatically generated emergency calls**
- **Requirements for caller location**
- **Requirements for caller / handset identification:**
- **Requirements about data registered by the owner of the handset**
- **Requirements on public warning**
- **Requirements on mobile coverage**
- **Requirements concerning accessibility**
- **Requirements concerning emergency Apps**
- **Requirements concerning privacy**
- **Requirements concerning languages**

The following list complements those requirements:

Stakeholders	Actions
European Authorities	Take action if MNO´s do not voluntarily provide PSAP with best location (GPS/WIFI)
National Government	Update regulations in pace with development of telecom technology and monitor MNO´s to see that they live up to regulations
PSAP organisations	Cooperate with MNO´s, handset manufacturers, and suppliers of mobile operational systems
Network Operators	Cooperate with PSAP Organisations and fulfil requirements
Handset manufacturers and suppliers of mobile OS	Cooperate with PSAP Organisations

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5 Acronyms

- PSAP – Public-Safety Answering Point, i.e. the Emergency call center
- MNO - Mobile network operator
- AML – Advanced Mobile Location
- PEMEA - Pan-European Mobile Emergency App
- CLI – Caller Line identification
- GPS – Global Positioning System
- IMEI - International Mobile Equipment Identity
- IMSI - International Mobile Subscriber Identity
- TC – Total Conversation
- RTT – Real Time Text
- ETSI - European Telecommunications Standards Institute
- ITU - International Telecommunication Union
- PWS – Public Warning System
- PWS-UE - Public Warning System User Equipment

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