



## EENA Operations Document

# SMS communication with PSAPs and EROs

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## Contributors to this document

This document was written by members of the EENA Operations Committee:

<b>Authors</b>	<b>Country / Organisation</b>
Iratxe Gomez	Spain / Atos (Co-chair EENA Operations Committee)

<b>Contributors</b>	<b>Country / Organisation</b>
Craig Anderson	Australia / Public Safety Business Agency
Luca Bergonzi	Italy / Beta80 (Co-chair EENA Operations Committee)
Thomas Biebaw	Belgium / Communicatie Project 112
Ian Colville	UK / Aculab
Graham Curry J.P.	UK / North West Ambulance Service NHS
Mark J. Fletcher	USA / Avaya (Vice-chair EENA NG112 Committee)
Cristina Lumbreras	EENA
Tadas Marošėikas	Lithuania / 112 LT ERC
Jiří Němčík	Czech Republic / ISC Moravian-Silesian Region
Tony O'Brien	EENA
Peter Sanders	The Netherlands / One2many (Vice-chair EENA Operations Committee)
Kaili Tamm	Estonia / Emergency Response Center
Jan Zeinstra	Belgium / Astrid

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## 1 Executive summary

SMS is not dead, even if a lot has changed in mobile messaging, especially in the last couple of years, with an obvious transformation in mobile markets in favour of Apps and other *Over The Top* (OTT) messaging services. And the reality is that SMS is used for communication with Emergency Services in many places in Europe (as reflected in the latest COCOM [R1]<sup>1</sup> Implementation reports) and all over the world (i.e. SMS to 911 in the United States and Canada).

While there are many different uses for SMS during emergencies, it should not be viewed as an alternative for real-time communication such as phone calls because of the differences in approach, costs and of course technology, among other things.

This document reviews current uses of SMS technology in Emergencies for both inbound and outbound communication with PSAPs and EROs; from accessibility to public warning, and from being a backup channel for apps to being a key tool in Advanced Mobile Location. It also compares emergency SMS and voice calls, presents the challenges of using SMS for emergencies, and analyses the different implementations across Europe and beyond, in order to share best practices and experiences

This new document complements the EENA Operations document on SMS access to 112 published in 2012 [R2]<sup>2</sup>.

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<sup>1</sup> [R1] [All COCOM implementation reports since 2011: http://ec.europa.eu/digital-agenda/en/eu-actions-112](http://ec.europa.eu/digital-agenda/en/eu-actions-112)

<sup>2</sup> [R2] [EENA Operations document: "SMS Access to 112" 2, June 2012](#)



## 2 Introduction

The European emergency number 112, which is used to contact emergency services free of charge all over the EU, is still not accessible by other means than voice calls in many regions and countries. It remains crucial that local citizens and visitors (national and foreign) are able to access appropriate emergency services whenever they need them, and to have confidence that they will be able to do so. This is even more important if we take the ever increasing mobility of people within the EU and the continuous growth of the European Union into account.

It is important to remember that voice communication between people in distress and emergency services is not always possible. This may be due to permanent or temporary hearing or speech impairments or even to circumstances preventing or not advising voice communication (i.e. circumstances where generating any sound to communicate to emergency services can put the caller in more danger).

Although the revised Universal Service Directive invited MS to ensure that access for disabled end users to emergency services shall be equivalent to that enjoyed by other end users, this is still a long overdue work in progress, and even if some see SMS as the solution for making ES accessible, it cannot yet be considered as a full equivalent access solution, although it can be suitable for people with disabilities to improve their ability to communicate with ES.

Moreover, with the growing use of mobile OTT messaging services and Apps for emergency communication (many of them offering the possibility of synchronous or asynchronous communication with PSAPs), the potential usage of SMS for emergency access (in short, eSMS) is potentially diminished. However, the overall usage of SMS in emergencies is being transformed, as we can see in the UK with the new Advance Mobile Location<sup>3</sup> service, or with the use of SMS as backup channel for emergency Apps to communicate with 112 in situations lacking of IP connectivity.

## 3 Update on the general use of SMS

A lot has changed in mobile messaging since the first SMS in 1992, but probably the most significant leap has occurred in the last couple of years, with an obvious transformation in mobile markets. Nevertheless SMS is still seemingly alive and well (and in use by a vast majority of the world population), and still accounts for almost half of all the revenue generated by mobile messaging around the world.

But with the widespread adoption of mobile Internet access, the global usage of SMS is rather rapidly shifting in favour of OTT messaging services such as Whatsapp<sup>4</sup>, Viber<sup>5</sup>, SnapChat<sup>6</sup>, or Asian players such as Line<sup>7</sup>, KakaoTalk<sup>8</sup> or WeChat<sup>9</sup>, which provide IM capabilities through mobile IP connectivity (and there are also SMS apps that take care of SMS and MMS messaging); some even provide multi-device capabilities and enhanced security (e.g. Telegram Messenger<sup>10</sup>). Furthermore the cost of OTT messaging services is clearly perceived as much lower than SMS by users generally.

We can't forget either that major Internet players such as Apple, Facebook and Google are now viewing the messaging market as a very lucrative complement to their core businesses, which will certainly increase mobile operators' concern about losing revenues that were consistent until very recently. Yet they still provide tools for SMS/MMS communications:

- Google has Hangouts<sup>11</sup>, which serves as a communication hub that also consolidates text messaging capabilities (while still having Messenger available for sending and receiving SMS/MMS).
- Apple has its Messages<sup>12</sup> app for allowing users to send and receive text messages (SMS/MMS).

<sup>3</sup> [http://www.eena.org/uploads/gallery/files/operations\\_documents/2015\\_02\\_18\\_AML\\_FINAL.pdf](http://www.eena.org/uploads/gallery/files/operations_documents/2015_02_18_AML_FINAL.pdf)

<sup>4</sup> <https://www.whatsapp.com/?l=en>

<sup>5</sup> <http://www.viber.com/en/>

<sup>6</sup> <https://www.snapchat.com/>

<sup>7</sup> <http://line.me/en/>

<sup>8</sup> <http://www.kakao.com/talk>

<sup>9</sup> <http://www.wechat.com/en/>

<sup>10</sup> <https://telegram.org/>

<sup>11</sup> <https://play.google.com/store/apps/details?id=com.google.android.talk>

<sup>12</sup> <http://www.apple.com/ios/messages/>

If we focus on the European market, in the last couple of years the popularity of text messaging has decreased significantly in some countries like Spain, The Netherlands or Germany, but apparently not in countries like France, the UK, Sweden or Norway.

SMS is still is a reasonable alternative to OTT messaging in situations where there is no IP connectivity, although the phone's SIM card of course needs to be registered to a mobile network in order to work. And in fact some believe that both services are highly complementary, rather than mutually competitive<sup>13</sup>.

And unfortunately SMS are not invulnerable to security threats and malicious DoS attacks either, in the same way as other technologies are (or may be in the future).

#### 4 Accessing emergency PSAPs and EROs using SMS

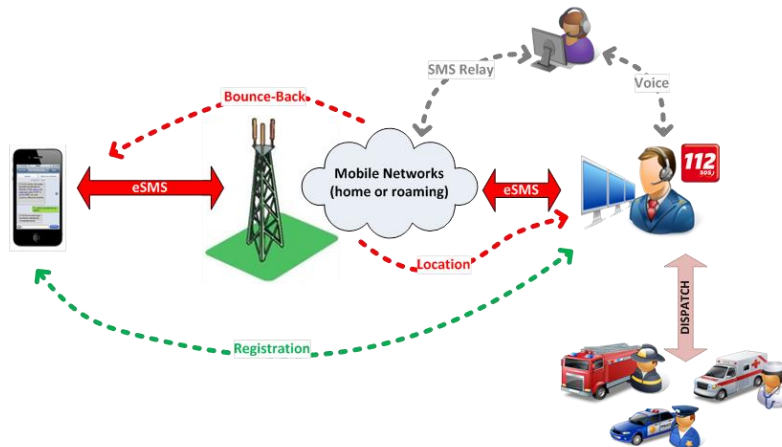
Emergency SMS and emergency calls to 112 should be treated equally according to queue time, and functionality for handling SMS messaging should be integrated into the PSAP case handling software, with records generated in an equivalent way to that done for all voice calls to 112.

Accepting an SMS-based communication channel for emergency call handling implies accepting an asynchronous way of data communication, and with this not being real-time communication, it usually leads to a lengthier handling time for the emergency call. The eSMS conversation must be logged with the case file.

Although typically SMS messages contain only 160 alphanumeric characters, increased length messages can be split in multiple short messages that are then concatenated and delivered in the right order to the PSAP, so they can have a coherent (yet non real-time) conversation during emergency call handling.

It is important to consider also the often lacking confirmation of read and bounce-back messages, which prevents the user from knowing if the SMS has been acknowledged by a PSAP or not.

The following picture presents a high level view of the call flow of eSMS, and the procedures that may be involved in it or not (depicted using discontinued arrows), such as registration, handling, confirmation, bounce back, etc.:



**Figure 1: Call flow of eSMS**

On top of the variables presented above, we need to consider additional variables that are used by some PSAPs or EROs (which are described later in the document):

- Start with voice call for location / identification purposes.
- Acknowledgement message provision, and maybe also end of call handling message provision.
- Usage of pre-defined short codes for an easier identification of the emergency. The example below shows a guide that describes how to send eSMS (and Fax) to 112 Catalonia through a 9-digit number, with the format "[one or two digit shortcode] + [Full name] + [Location]" (for medical emergencies there are 3 additional questions that don't have any shortcode linked to them).

<sup>13</sup> <http://www.portioresearch.com/en/messaging-reports/mobile-messaging-research/mobile-messaging-futures-2014-2018.aspx>

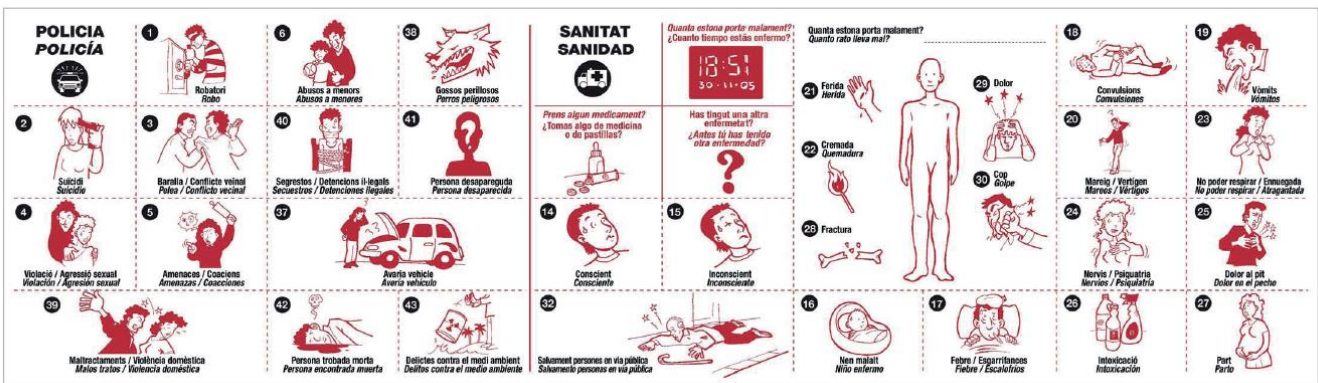


Figure 2: Example of short codes used for eSMS (and fax) in 112 Catalonia<sup>14</sup>

All in all, we can summarize the differences between communication of emergency situations through SMS and voice calls from a technical point of view:

- Difficulties in routing to the most appropriate PSAP, and even more difficulties in making SMS to emergency services available while roaming (because "home" networks are used for SMS instead of "host" networks).
- A working SIM card is required in the originating device, and there must be memory available in the phone. It is also more difficult to make SMS to PSAPs and EROs free of charge. Furthermore, depending of the countries, SMS to 112 may not work if the phone is out of credit and despite the fact that SMS to 112 ought to be free to the citizens.
- Communication through SMS is not real-time communication and call handling time is lengthier.
- The need for registration never happens for voice callers, but it may reduce the number of hoax calls compared to 112 voice calls.
- From a network perspective,
  - "112" as short code is not always available, and often other short codes and even long numbers are used for SMS-based emergency communications.
  - SMS messages to 112 are not usually defined as an emergency communication, like voice calls to 112 are (and SMS does not have the same "carrier swapping" capability as voice). It is not possible to establish a total prioritisation of SMS.
  - Positioning and location of SMS is not available in most cases, as automatic caller location is not included in the standard.
  - There may be a confirmation that the SMS has arrived to the device, but no confirmation that it has been read.
  - There may be potential technical delays due to bad weather, big disasters, big planned events etc. In Australia, planning is underway to implement a dedicated eSMS channel in the carrier network to bypass the traditional SMS gateways and reduce delays during major events or as a result of the 'store and forward' protocols.

<sup>14</sup> <http://112.gencat.cat/en/que-fem/apps-per-dispositius-mobils/index.html>



## 5 SMS channel use cases in emergencies

The use of SMS in emergencies is no longer limited to a means of making PSAPs and EROs more accessible to people with disabilities. And we must not forget that SMS communication as an asynchronous way of communicating usually takes much longer than traditional voice-centric and other real-time communication mechanisms (i.e. Total Conversation or Real-Time-Text); we must not forget that in an emergency, time is much more valuable than gold.

The following sections summarize some of the existing uses of SMS in emergency communications.

### 5.1 eSMS for people with hearing or speech disabilities

Access to 112 for people that are deaf, deafened, hard of hearing or with speech impairment can be provided using different communication channels, as explained in the EENA operations document "112 Accessibility for People with Disabilities"<sup>15</sup>; eSMS is one of such systems.

In many PSAPs and EROs, eSMS has been implemented solely for use by people with hearing or speech impairments, and registration is normally required. Getting the location of the eSMS sender is one of the challenges for most PSAPs / EROs (SMS location is possible but not always available), some have opted for asking callers to initiate the service with a voice call to 112 for location and identification purposes, and then continuing the conversation through SMS (or chat-like services) while leaving the voice channel still open (this also helps keep the call taker engaged). In many cases, the number the reply SMS is sent from is different from the 112/999/911 short code; it can be either a different short code or a long number (i.e. for the T9-1-1 service in Canada it is a 13-digit number beginning with 555-911).

Other PSAPs & EROs have opted for allowing direct eSMS communication (without an initial voice call):

- In some regions across Europe direct eSMS service to 112 is allowed for registered users only (i.e. Estonia, Ireland, Latvia, Sweden or the UK), while in some other regions the eSMS to 112 service is open to everyone (i.e. Iceland and Lithuania).
- In other regions (i.e. Belgium, Norway or Portugal) different numbers are used, which can be either short codes or long numbers.
- In the UK, an eSMS service to 999 (also to 112) is available for registered users, and mobile networks provide such service nationwide as a regulatory obligation.
- In Latvia, the registration gets the person sending an eSMS to 112 priority in the response.
- In some regions in Spain they have even opted for advising the use of pre-defined short codes to be sent within the eSMS for identifying the type of emergency situation.
- In the US, if someone attempts to send an eSMS to 911 where the service is not yet available, FCC rules<sup>16</sup> require all mobile carriers and other SMS providers to send automatic "bounce-back" messages advising users to contact ES by another means than eSMS.

Some regions have opted for using SMS relay services which would allow emergency communications too, and therefore have avoided direct implementation of eSMS in PSAPs or EROs:

- One of the most relevant examples of this is France, where they have established a dedicated national emergency number -114- and relay service for hearing or speech impaired people that is accessible through SMS and other channels.
- Australia is another example of availability of SMS relay for emergencies, but it is recommended only as a last resort for registered users of the deaf and hearing impaired community.

Finally, SMS could also serve as backup channel for Total Conversation (TC) ready PSAPs and EROs when mobile IP connectivity is degraded or lost and prevents the TC functionality in handsets from working properly.

<sup>15</sup> [http://www.eena.org/uploads/gallery/files/operations\\_documents/2012\\_01\\_13\\_112accessibilityforpeoplewithdisabilities.pdf](http://www.eena.org/uploads/gallery/files/operations_documents/2012_01_13_112accessibilityforpeoplewithdisabilities.pdf)

<sup>16</sup> <http://www.fcc.gov/text-to-911>





## 5.2 Emergency situations preventing or not advising voice communication

Voice communications are not always a possibility for people in distress even if they don't have a hearing or speech disability. It may be a situation that requires total silence from the caller (i.e. the caller is in a dangerous situation in which speaking would endanger him/her, or disclose his/her location if hidden), or that due to a very noisy environment the caller cannot hear or be heard by the PSAP call takers (i.e. close to the loudspeakers and in the middle of a very big crowd in a rock concert).

In those situations, both eSMS-capable PSAPs/EROs that don't require a registration (or have alternate numbers for non-registered users), and PSAPs and EROs that have integrated alternative means of communication such as emergency Apps, should be able to respond to the help request of a non-registered caller. Yet not many PSAPs and EROs with emergency SMS communication capabilities allow non-registered users to send them an eSMS while in a distress situation. For example, the local 112 PSAP in the Extremadura region of Spain<sup>17</sup> has released an alternative phone number for people not yet registered in their databases to send SMS-based help requests in exceptional situations, but they still promote the eSMS service as a communication mechanism for people with hearing or speech disabilities that are registered (or are entitled to be registered) in their databases.

## 5.3 Use of SMS for the provision of Advanced Mobile Location of voice calls

The new Advanced Mobile Location<sup>18</sup> service in the UK uses the existing eSMS service infrastructure to provide more precise mobile location information to the 999 PSAPs, in a transparent way for the callers, and by using the GPS and WiFi facilities in handsets enabled for such service.

With no impact on the standard emergency call (voice + cell location), the smartphone recognises that an emergency call is being made, and collects location information for a certain amount of time. It then sends a zero-rated SMS to 999 containing information such as the phone number, WiFi or GPS location and precision along with data to validate message (this is done in a transparent way for the user, as it is not visible in the handset) The 999 Location service then matches the voice call to the SMS, verifies the plausibility of the location provided and is then in a position to provide enhanced location information to EROs.

## 5.4 SMS as backup communication channel for emergency Apps

Some of the existing emergency Apps that are nowadays recognized by PSAPs and EROs worldwide provide SMS-based text communication as a backup channel in situations when there is a lack of sufficient IP connectivity preventing the messaging App from operating normally. It can be used for instance to send GPS coordinates and other relevant user details from the handset to the PSAP.

A sample list of existing emergency Apps can be found in the EENA 112 Apps Strategy operations document<sup>19</sup>.

## 5.5 Use of SMS for resource dispatching by PSAPs and EROs

Some PSAPs and EROs (i.e. 112 Iceland<sup>20</sup>) use SMS messaging to send dispatch data to resources (and maybe also to other relevant assets) and to exchange data with them, when Radio data or IP communication is unavailable. Sometimes also SMS may be used as backup data communication channel.

## 5.6 Use of SMS to inform callers about resources dispatched to assist them

SMS is also being used by some PSAPs or EROs (i.e. SAMUR-PC in the city of Madrid<sup>21</sup>) for sending the mobile callers to 112 a confirmation of the resource allocation (normally from EMS, FRS or Police), providing information of the estimated time of arrival (when available), and allowing both the ES and caller to provide updates of the situation to each other.

<sup>17</sup> [http://www.gobex.es/filescms/112/uploaded\\_files/ProtocoloDiscapitadosAuditivos\\_1.9\\_DEFINITIVO\\_MARZO\\_2015.pdf](http://www.gobex.es/filescms/112/uploaded_files/ProtocoloDiscapitadosAuditivos_1.9_DEFINITIVO_MARZO_2015.pdf)

<sup>18</sup> [http://www.eena.org/uploads/gallery/files/operations\\_documents/2015\\_02\\_18\\_AML\\_FINAL.pdf](http://www.eena.org/uploads/gallery/files/operations_documents/2015_02_18_AML_FINAL.pdf)

<sup>19</sup> [http://www.eena.org/download.asp?item\\_id=96](http://www.eena.org/download.asp?item_id=96)

<sup>20</sup> [Presentation by Tómas Gislason during EENA Conference 2014 \(Day 1, Track 2 – Session 2 - SMS & 112 App\)](#)

<sup>21</sup> <http://www.madrid.es/portales/munimadrid/es/Samur/Samur-Proteccion-Civil?vgnextfmt=default&vgnextoid=c88fcd1bffa010VgnVCM100000d90ca8c0RCRD&vgnnextchannel=84516c77e7d2f010VgnVCM100000b205a0aRCRD&idCapitulo=5650227>



### 5.7 Public Warning systems based on SMS

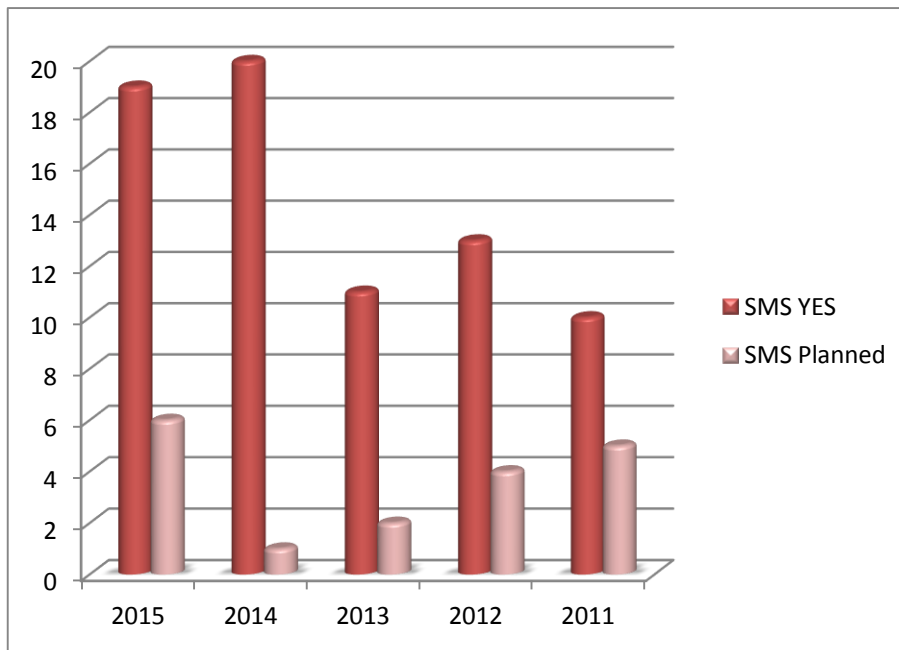
SMS can also be used in reverse 112 type communications. The usage of SMS for Public Warning has two main modalities:

- A subscription-based system, in which only mobile users subscribed to PSAP/ERO services would receive public warning notifications via SMS.
- A location-based broadcast system allowing PSAPs or EROs to push SMS messages to all mobile phones in a certain geographical area.

Further details on the use of SMS for Public Warning can be found in the documents devoted to Public Warning released by the EENA Operations Committee.

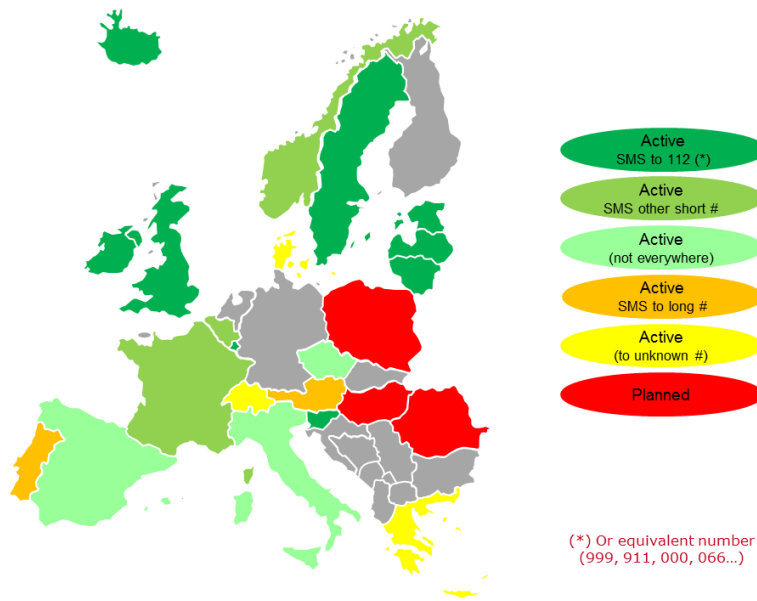
## 6 Analysis of current situation and examples of implementation

The COCOM Implementation reports published between 2011 and 2015 mention SMS for PSAPs & EROs being implemented or planned in several countries. Unfortunately the data from one year to another does not seem very consistent:



**Figure 3: Evolution of the implementation of SMS for emergencies in Europe**

The following map represents a sample of existing implementations, with the first difference being the status of implementation (active or planned), and the second relevant difference being the usage of the 112 short code, other short codes or long numbers.



**Figure 4: European implementation map of eSMS (sample)**

Letting alone the technical difficulties of implementing an eSMS service in countries where 112 services are of regional competence, and the decrease in the use of SMS as a communication channel, we can clearly see that the way of deploying eSMS is very diverse, even within countries.

The following table shows details of the current situation of eSMS across Europe:

Country	eSMS Y/N?	Short code or Long number?	Pre-registration Y/N?	Free of charge Y/N?	Comments
Albania	NO				
Austria	YES	LONG to 0800-133-133	YES	YES	For people with hearing or speech disabilities., they transfer incoming SMS to a telefax server to avoid communication blockages (see Annex)
Belgium	YES	SHORT to undisclosed 4-digit numbers (1 for POL, 1 for FRS/EMS)	NO	YES	For people with hearing or speech disabilities, who need to request the numbers from the authorities via email or SMS. Not to 112, 100 or 101. Operational since February 2015. <a href="#">Info</a> (see Annex)
Bosnia & Herzegovina	NO				
Czech Republic	YES (not everywhere)	LONG number	YES	NO	Regional implementations, not national. In the Moravian-Silesian Region it is for pre-registered people with hearing or speech disabilities; They handle 1 or 2 cases by SMS per year, and 3 to 4 SMS are needed per case on average.
Estonia	YES	SHORT to 112	YES	YES	Anyone can register, but service targeted to people with hearing and speech disabilities. In 2014 they managed 47 cases (with resource dispatch) by SMS from a total of 54 SMS-based requests. 15 SMS are needed per case on average. Call takers are trained in language use of people with hearing and speech disabilities.
Finland	YES	LONG to different numbers (depending on PSAP)	Not yet decided		

France	YES	SHORT to 114	NO	NO	For people with hearing or speech disabilities. <a href="#">Info</a> (see Annex)
Georgia	Planned				(Q1 2015)
Germany	NO				
Hungary	Planned				(Q3 2015)
Iceland	YES	SHORT to 112	NO	YES	Open to everyone. < 0,1% from hearing impaired
Ireland	YES	SHORT to 112	YES	YES	For people with hearing or speech disabilities.
Italy	YES (not everywhere)	LONG to an undisclosed number (in Lombardy)			Only in a few provinces (i.e. Regione Lombardia)
Kosovo	NO				
Latvia	YES	SHORT to 112	YES for priority	YES	Open to everyone. But SMS from people with disabilities are served with higher priority as the system recognises the phone numbers pertaining to the members of the database of the Latvian Association of the Deaf.
Lithuania	YES	SHORT to 112	NO	YES	Open to everyone (see Annex)
Luxembourg	YES	SHORT to 112 and Police	YES	YES	For people with hearing or speech disabilities.
Republic of Macedonia	NO				
Malta	YES	LONG to 0356 79777119 (Malta Police)			
Moldova	NO				
Montenegro	NO				
Netherlands	YES	LONG to 0800 8122			Since July 2012 a digital text service is available with direct access to 112. Analogue devices can call 0800-8112
Norway	YES	SHORT to 1412			
Poland	Planned				(End of 2015)
Portugal	YES	LONG to 96 10 10 200	YES		For people with hearing or speech disabilities
Serbia	NO				
Slovakia	NO				
Slovenia	YES	SHORT to 112	YES		For people with hearing or speech disabilities
Spain	YES** (not everywhere)	LONG to different numbers (depending on regional PSAP)	In some regions YES	NO	**In some regions, it starts with a voice call (see Annex).
Sweden	YES	SHORT to 112	YES	YES	During the REACH112 project, they compared handling times of SMS, voice calls and Total Conversation. See detail in section 7.6.
Switzerland	NO				REGA (private EMS) has an eSMS service (1414). Also an SMS Relay service provided by Procom Foundation.
Turkey	Planned (not everywhere)				(Planned in Antalya)
United Kingdom	YES	SHORT to 999 or 112	YES	YES	eSMS for people with hearing or speech disabilities and walkers and climbers who visit areas with bad mobile phone access . <a href="#">Info</a> (see Annex).

**Table 1: Availability of SMS access to PSAPs & EROs in Europe**



There are also other examples outside Europe, as shown in the following table:

Country	eSMS Y/N?	Short code / Long number	Preregistration Y/N?	Free of charge Y/N?	Comments
Australia	Planned	SHORT to 000	NO	YES	Triple Zero (000) is planning on implementing an open eSMS service direct to the primary emergency service number (000). Currently there is an SMS relay usable for emergencies (but recommended only as a last resort (see below and annex for additional detail)
	YES	SHORT to 106	YES	NO	106 is a relay service for registered deaf and hearing impaired persons to contact a single service that can provide relay services to the primary emergency number Triple Zero (000) <a href="#">Info</a>
Canada	YES* (not everywhere)	SHORT to 911*	YES	YES	* It starts with a voice call to 911 (i.e. for carriers Bell, <a href="#">Telus</a> or <a href="#">Rogers</a> ). Text to 911 is available in all Nova Scotia, and partially in another 4 provinces. <a href="#">Info</a>
New Zealand	YES	SHORT to 111	YES	NO	New Zealand Police operate a Text to 111 service for registered users from the deaf and hearing impaired community. <a href="#">Info</a>
USA	YES (not everywhere)	SHORT to 911	NO	YES?	Text-to-911 is being deployed nationwide under FCC mandate. Bounce back messages when eSMS to 911 not available. <a href="#">Info</a> Available in all PSAPs in INDIANA, and some PSAPs in another 11 states (see annex for additional detail)

**Table 2: Availability of SMS access to PSAPs & EROs outside Europe (sample)**



## 7 Overview of the challenges in the use of eSMS

eSMS implementation and usage faces multiple challenges. To name but a few:

### 7.1 eSMS to 112 not always possible

In some countries it may not be possible to send eSMS to 112 because the 112 service as such is defined as a "dialog" system. In fact this may be one of the reasons why eSMS are sent to other short numbers or even long numbers (following the ITU-T recommendation on the international public telecommunication numbering plan E.164). Also SMS cannot be sent from SIM-less handsets, or from inactive SIM cards.

EENA strongly recommends that MNOs send bounce-back messages when service is not available, similar to the service provided in the US under FCC mandate with regards to the text-to-911<sup>22</sup> services.

### 7.2 Potential unavailability of eSMS to local PSAPs while roaming

Unfortunately, there is no uniformity between network operators in Europe, and services that are available to users in their home networks are often not available while roaming. This is particularly relevant for SMS services, and is probably one of the biggest challenges for a pan-European solution.

Unfortunately, there is always a likely chance that an eSMS sent while roaming will not arrive anywhere. An example that acknowledges this situation is the new eSMS service in Belgium<sup>23</sup>, which clearly specifies the terms for service by saying that registered users can only send an eSMS from a Belgian SIM card, but not from a foreign SIM card.

### 7.3 Potential prioritization of eSMS in the network and routing to the right PSAP

Currently the SMS sent to ES can't be prioritized in the network, but the advantages of doing so would be great for all eSMS, and this would imply an equivalent treatment of eSMS with regards to voice call to 112 in the network.

In the case of a voice call, dialling 112 sets up an emergency voice call, which is recognized by the network and routed to the most appropriate PSAP. Unfortunately such a mechanism doesn't seem to exist for SMS; nowadays an eSMS cannot be recognized by a mobile network as an emergency SMS (regardless of the number). For 2G and 3G SMS there is no such thing as an emergency SMS service (IMS shall make a difference, but it is only available in LTE networks).

### 7.4 Provision of location information of eSMS messages

One of the key considerations for the adoption of eSMS is the potential unavailability of location information provision by the MNO or other means.

This is why some have opted for starting the communication with registered users with a voice call to 112 (for which the mobile location is provided by the MNO), which will then trigger an SMS-based (or maybe chat-based) conversation. Often the replies from the PSAP or ERO come from a number different from 112 (although it may be on occasions simulated to come from 112).

### 7.5 Registration process may be lengthy

Although registration is not always required, the fact is that the requirement for registration (and the length of the process) may leave out people in distress that are suddenly or temporarily incapable of hearing or speaking. To solve these potential situations, some PSAPs opt to have an additional number available for unregistered users, intended only to be used exceptionally (i.e. 112 Extremadura in Spain).

Also, the format and length of the registration may vary a lot, and it can be, for example:

- SMS-based registration
- Web-based registration
- Registration through public registry entities
- Registration through specific associations

In any case EENA recommends that it should not require more than a day for completing the process of registration.

<sup>22</sup> <http://www.fcc.gov/text-to-911>

<sup>23</sup> <http://www.112.be/en/sms>

### 7.6 Integration in PSAP workflow and length of conversation

For the integration of eSMS into the PSAP network, a few things need to be considered:

- eSMS could be sent to 112 or to other numbers, but may or may not have priority in the network as voice calls to 112 have.
- Given that it is an asynchronous means of communication, the handling time may mean taking up a lot of time from call takers in the PSAP or ERO.

This is why all PSAPs and EROs handling eSMS needs to have clear and concise protocols for handling them, and support from adequate tools, with the integration of the SMS channel into the call-taking and CAD systems, logging of all messages linked to each case in the right chronological order, etc.

The following example of data gathered by SOS Alarm in Sweden during the REACH112 pilot experimentation from February to April 2012 clearly shows that total handling time for SMS-based calls is much greater compared to voice or Total Conversation calls (Total calls included in the comparison: 20 SMS calls, ~450K voice calls, 10 Total Conversation calls).

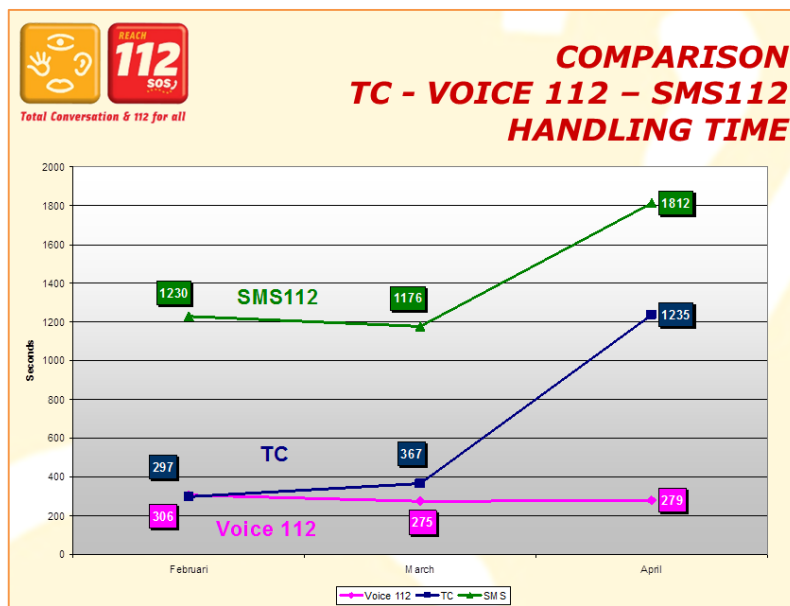


Figure 5: Comparison of handling time between TC, Voice and eSMS to 112 in Sweden<sup>24</sup>

### 7.7 Different models complicate things for users when travelling

Not only different numbers are used in different regions and/or countries for eSMS, which unfortunately are not broadly publicised either, registration may also be needed for being able to use eSMS, and one registration does not cover all PSAPs and EROs (this could be solved for instance by making registrations extensible to all eSMS-ready PSAPs in Europe, data protection regulations permitting).

On top of that, some PSAPs may require starting with a voice call for identification and location purposes, and there is the potential usage of pre-defined short codes which factors in an additional complication i.e., making them known to the target public and visitors.

### 7.8 Cost of eSMS vs. voice calls to 112 or other mobile messaging mechanisms

Although in some countries and regions eSMS are free of charge for the user (provided the user has a mobile subscription), eSMS to PSAPs and EROs often have a cost for the user, as opposed to 112 calls which are always free.

Their mobile operators either charge users for each SMS individually (for outgoing and sometimes also incoming SMS) or for packs of SMS (i.e. 100, 1000 or unlimited) per month included in the user's price plan. While roaming, SMS plans vary a lot too, and they are normally even more restrictive and expensive.

<sup>24</sup> Bjorn Skoglund, SOS Alarm (Sweden). „Integration of Total Conversation in a standard 112 Emergency Call Centre environment and comparison with 112 SMS“. 29/6/2012, REACH112 project final conference, Santiago de Compostela (Spain)



## 8 EENA recommendations

The following list summarizes some key recommendations related with eSMS usage:

- eSMS shall be available for communication with PSAPs and EROs using the same short-code as for voice calls
- SMS to 112 shall be recognised as an emergency SMS and therefore routed to the most appropriate PSAP
- eSMS shall be free of charge for citizens and visitors
- eSMS shall be available while roaming
- Location information shall be provided for eSMS by MNO
- Bounce-back messages shall be provided when eSMS service is unavailable

The set of actions recommended for each stakeholder is presented in the following table:

Stakeholders	Actions
<b>European Authorities</b>	Provide clear and mandatory regulation on the use of emergency SMS, including: <ul style="list-style-type: none"> <li>• Accessibility of 112 using eSMS</li> <li>• Use of 112 (or equivalent) SMS shortcode</li> <li>• Mandatory free of charge service</li> <li>• Provision of location information</li> </ul>
<b>National telecommunication regulator</b>	Supervision of the creation and functioning of the eSMS service, including: <ul style="list-style-type: none"> <li>• Short code availability</li> <li>• Free of charge for end users (citizens and visitors)</li> <li>• Provision of location information</li> <li>• Provision of confirmation or Bounce Back messages</li> </ul>
<b>Mobile Network operators</b>	Provide eSMS services to PSAPs and EROs: <ul style="list-style-type: none"> <li>• Creation of a 112 shortcode (or equivalent) for eSMS</li> <li>• Route eSMS to the most appropriate PSAP</li> <li>• Prioritization of eSMS on the network</li> <li>• Provision of location information for eSMS</li> <li>• Provision of confirmation &amp; bounce back messages</li> </ul>
<b>National / Regional Authorities</b>	<ul style="list-style-type: none"> <li>• Registry of eSMS-ready PSAPs</li> <li>• Implementation of eSMS in case it is not available</li> </ul>
<b>Emergency Services</b>	Adaptation of PSAPs to the use of eSMS: <ul style="list-style-type: none"> <li>• Integration in the ICT system</li> <li>• Creation of procedures to handle eSMS-based calls</li> <li>• Training to PSAP operators</li> <li>• Establishment of clear and simple pre-registration procedures, if needed</li> <li>• Creation of clear guidelines for citizens and visitors</li> </ul>
<b>End-user associations (e.g. Deaf and HoH people associations)</b>	Adaptation of the eSMS service to user needs: <ul style="list-style-type: none"> <li>• Creation of clear guidelines for members</li> </ul>

**Table 3: EENA recommendations**





## 9 Annex 1 – European examples

### 9.1 Austria

The example of Austria is presented because their long time SMS/Fax/email service availability, with the specificity that they transfer incoming SMS to a telefax server to avoid communication blockages.

Following an initiative of the Ministry of Interior, the major telecom providers and WITAF (Wiener deaf-mute Care Association), the emergency SMS/Fax service was established in 2003. The technical platform was set up by the Federal Ministry of the Interior, and response is provided from the Vienna Police Headquarters.

It is a service intended for deaf and hearing impaired people only (registration is required and only works in Austria) who have three ways of getting help from EMS, FRS, Police, Mountain Rescue or two automobile clubs (in case of breakdown): SMS (citizens can send an SMS that is transferred to a dedicated Telefax server, so a block-free communication guaranteed), Fax or email.

The phone number (same for SMS and Fax) and email are public, calls are free, and an emergency fax form and SMS manual are accessible from <http://www.witaf.at/gehoerlosen-notruf>. The information to be provided in the SMS includes:

1. Identification of the sender as deaf / hard of hearing / hearing impaired
2. Provision of his/her Name
3. Provision of mobile phone (for SMS) or Fax number
4. Provision of a location as accurate as possible (i.e. PC, City, Street / Road, House Number / Km, Door / direction)
5. State which ES is need: Police, Rescue, Ambulance, Fire, Mountain Rescue, ÖAMTC, ARBÖ
6. Specify what happened: Fire, robbery, violence, road accident, skiing or mountain accident...
7. Indicate (if possible) how many victims there are and their status

Example: *"I am deaf, Jane Doe, 0664 12345678, 6888 Anytown, Highway 21 Km170 Eastbound, I need rescue because of accident, 3 injured"*.

Some relevant figures:

- In 2011 they received 235 Austria-wide request for assistance through 0800 133 133: 183 were through SMS and 52 through Fax.
- Of the 183 SMS requests, 62 were requests to one of the automobile clubs, and 121 were requests for assistance from ES; they did observe a steady increase in this form of emergency.

### 9.2 Belgium

The example of Belgium is presented because their eSMS service is one of the newest (it launched in February 2015). The Federal Public Services Public Health and Home Affairs and the integrated police made possible to reach PSAPs by SMS.

The service is free, and available everywhere, but public authorities clearly specify that the service is unavailable for roaming users (only Belgian SIM cards / Belgian phone numbers are compatible with the service; SMS sent from non-Belgian SIM cards / phone numbers are not received).

In the first stage of the eSMS rollout, Belgian public authorities have opted not to use the traditional emergency numbers (112, 100 or 101, which are reserved for voice calls); instead they've allocated two 4-digit short numbers, one for Police and another one for FRS & EMS.

It is a service for people with hearing or speech disabilities only; pre-registration is not required. People with hearing or speech disabilities can obtain the two numbers by specific request via email or SMS from the Federal Public Service Interiors.

Their plans for a next phase are that the traditional emergency numbers 112, 100 and 101 could also be reached. One of their challenges is the location of the caller, and they advise users to be precise in the provision of location information.



The process can be summarised as follows:

1. Deaf and hearing impaired people and people with a speech impediment need to send a request (via email or SMS) in order to be informed of the two available numbers (for police and FRS & EMS).
2. In an emergency situation, the user can send an initial SMS to one of the two numbers indicating Who they are, and Where exactly the problem is happening. In case of need, they can use whatever mobile phone available (even one they are borrowing temporarily from someone else), as the PSAP operators treat all SMS they receive.
3. ES will send a first response SMS acknowledging reception of the initial message, and then they ask for additional information, such as specifying whether the incident is a fire, a fight, somebody who fainted, a burglary, an accident, a blow to the head, major bleeding, ....
4. ES will send a second confirmation to say that they have received the message and to inform that EMS, POL or FRS have been warned and are on their way.

Some additional facts:

- Belgian authorities advise users not to disclose the numbers to other people belonging to the target group (as they should request the specific numbers themselves as much as possible).
- Messages can be kept for a year, in accordance to local regulations on electronic communication and data protection.
- They have fixed procedures for when an eSMS for police assistance arrives at the EMS & FRS PSAP, or the other way round.
- People using eSMS "to play jokes" risk legal action to be taken against them (if users send an SMS to ES by mistake, they should send a second SMS to report the mistake).
- Users travelling abroad that send an SMS to any of the two numbers will receive an error message.
- Belgian PSAPs accepting eSMS don't accept MMS.

### 9.3 France

The example of France is presented because it's the only country so far with a dedicated emergency number and relay centre for people with hearing or speech disabilities, which was initially launched with SMS & Fax as the main communication channels, but is being extended to provide also real-time communication capabilities through Total Conversation.

The 114 number in France is an exclusive emergency number for deaf and hard of hearing people, and provides access to the National Relay Centre (CNR114), which in turn can connect (voice and/or data) with all ES in France. This relay centre has teams of deaf and hearing operators working together.

The current SMS/Fax service was launched in 2011, and is available nationally, with plans to include also overseas French territories at some point, and it is open to everyone although (an active French SIM card is needed for SMS) but intended in principle only for people with hearing or speech disabilities. The SMS is not free of charge for users.

Until recently caller location information had to be requested by fax to the MNO, but the ongoing project for the extension of the communication channels of CNR114 (Total Conversation, email) includes the integration of pushed location information for all emergency requests, regardless of the channel used.

Some additional facts:

- The SMS channel is remains one of the possible direct communication channels of CNR114, but also as backup channel for Total Conversation Apps in situations with degraded or lacking IP connectivity.
- According to the latest COCOM Implementation report, the 114 has had 128K calls corresponding to 7K cases, and each case requires an average of 15 SMS or 11 faxes

### 9.4 Lithuania

The example of Lithuania is presented because their 112SMS (eSMS) service is open to everyone without restriction, and it was launched in May 2014. The number used for eSMS is 112 (free-of-charge for users) and the service is available all over Lithuania (all communications are done in Lithuanian language).

Automatic provision of location information for eSMS is not available due to limited network capacities. However, location information for eSMS is available by verbal contact with mobile network operator's technical centres.



The process of eSMS call taking is as follows:

1. If there's any hint on potential emergency in the text of the eSMS, but there's not enough information about location and/or the nature of the emergency, an immediate standardized pre-defined text is sent to the sender: *"Received. Can we call you back? If not, text us your address and what's happened. Without any response from you your message will not be responded to"*.
2. If the sender responds positively, the PSAP operator will make a voice call-back and perform regular call handling procedures.
3. If the sender texts that he/she cannot talk, further communication is done via SMS until all necessary information is gathered.
4. If the sender doesn't respond to the PSAP operator's request for a call-back, any further eSMS handling is terminated.

If the eSMS clearly contains information unrelated with an emergency, the PSAP operator performs no actions. In case of multiple offensive or inappropriate SMS from the same number, the PSAP operator will send a pre-defined text to the sender: *"You disturb the work of ERC. The police will be informed about your SMS. ERC"*.

### 9.5 Spain

The example of Spain is presented because of the regional disparity of the availability of eSMS. The following table presents the regional differences in the use of eSMS by 112 PSAPs in Spain (note that 112 service provisions being a regional competence, there are 19 different 112 services, one per region, but not all are listed in the table).

Region	eSMS Y/N?	Short / Long number?	Number	Pre-registration Y/N?	Free of charge Y/N?	Comments
Aragon	Y*	LONG	*112 (replies from long number)	Y	N	* Starting with voice call to 112 for identification, location. Follow up with SMS or Chat
Balearic Islands	Y*	LONG	*900 112 100			* Starting with voice call to long number (not 112) for identification and location. <a href="#">Info</a>
Canary islands	Y*	LONG	*112 (replies from long number)	Y		*Starting with voice call to 112 for identification, location. <a href="#">Info</a>
Castilla La Mancha	Y*	LONG	*112 (replies from long number)	Y	N	* Starting with voice call to 112 for identification, location. Follow up with SMS or Chat. <a href="#">Info</a>
Castilla y León	N					
Catalonia	Y	LONG	679436200	Y	N	They use short codes. <a href="#">Info</a>
Basque Country	Y	LONG	600123112	N	N	They use short codes. <a href="#">Info</a>
Extremadura	Y*	LONG	*112 (replies from long number)	Y	N	*Starting with voice call to 112 for identification, location. Follow up with SMS or Chat. <a href="#">Info</a> They provide an additional long number (900555112) for non-registered users, to be used exceptionally.
Galicia	Y*	LONG	*112 (replies from long number)	Y	N	* Starting with voice call to 112 for identification, location. They have certain types of messages defined with Galician Association of Deaf People.
Madrid	Y*	SHORT	*112 (replies from 5112)	Y	N	* Starting with voice call to 112 for identification, location.
Melilla	N					
Navarra	Y	LONG	650738005	Y	N	
Valencia	N					

**Table 4: Availability of eSMS in Spain – regional view**



Some facts can be extracted from this list:

- There is a clear disparity of models, but in none of them is a direct eSMS to 112 possible.
- The service is not free of charge for the users.
- There is no bounce-back message to inform that eSMS service is unavailable.

## 9.6 United Kingdom

This example is presented because the UK has been using eSMS for a few years now, and has recently extended the usability of SMS in Emergencies with the launch of the AML service (described in section 5.3).

The emergency SMS (eSMS) service in the UK was developed as an alternative option for contacting for those unable to use voice 999/112 service, particularly (initially at least) those with hearing or speaking difficulties who routinely use SMS (rather than using RTT terminals to contact the text relay service) or as an alternative in circumstances where other options are unavailable. The service was extended in 2010 to walkers & climbers needing 999 assistance in the hills when mobile reception is poor and there is not enough signal to make a call (Mountain Rescue Services in the UK are usually coordinated by the police).

The number used for eSMS is 999 (or 112), and it is a zero-rated SMS for users. It cannot be used from outside the UK.

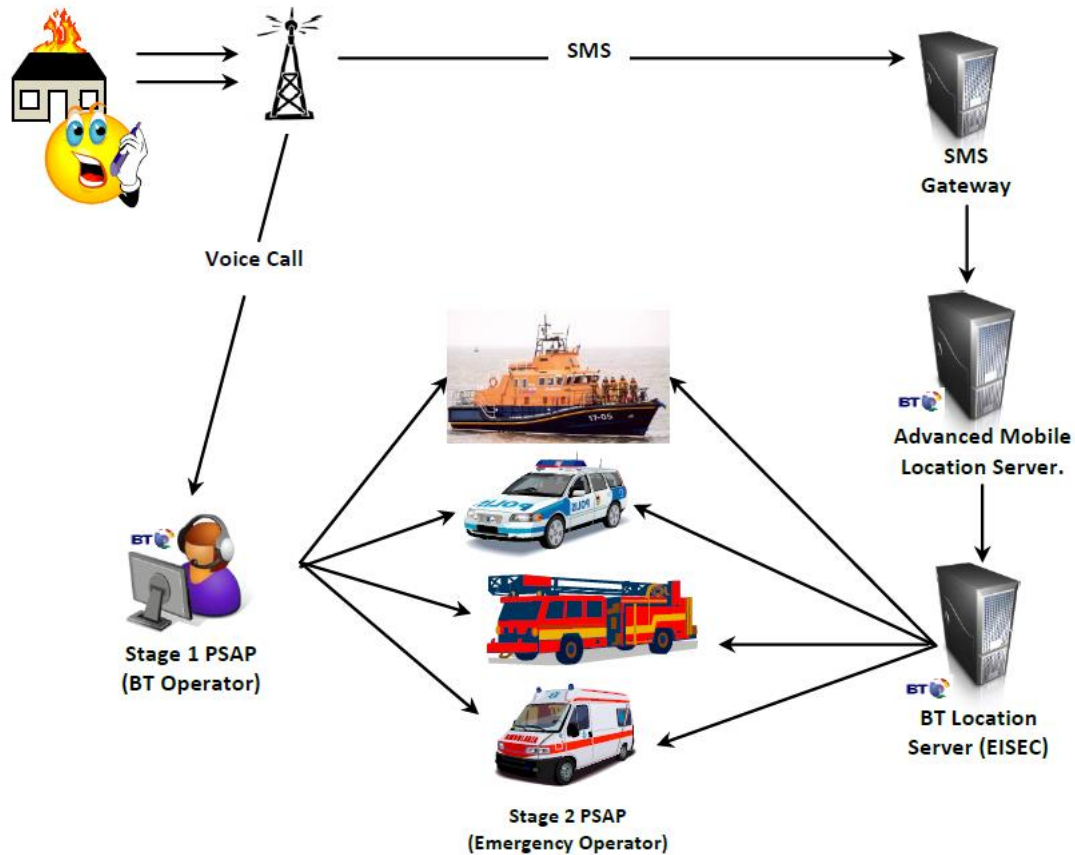
The process for eSMS can be summarized as follows:

5. Users have to register their mobile number either through a specially provided website or entirely via text message (non-registered users will not get any response if they send an SMS to 999 or 112).
6. A registered user can then send an initial SMS to 999/112 indicating *What* the problem is, *Where* exactly the problem is happening and *Who* is needed (FRS, EMS, POL, Mountain Rescue or Coastguard). They should not assume that their message has been received until the ES sends a message back, and it will usually take about two minutes before they get a reply. If they don't get a reply within three minutes, they are advised to try again or find other ways of getting help.
7. The eSMS is transmitted over a voice link to the Text Relay Service (which also handle text phone calls for ES), who in turn will announce the call to the BT 999 PSAP, who receives the customer's mobile CLI and can then route the call to the right stage 2 PSAP by clearly stating the call is SMS originated. Location information is also passed to the emergency services through the EISEC service. As SMS are sent via each mobile network's SMSC to an SMS Aggregation Service, and then to an eSMS server and to the BT Location Hub (cell coverage from mobile networks) before it reaches the 999 Call takers.
8. A dialogue is established between the ERO and the user through the Text Relay, while the 999 call taker remains on line.
9. Users shall receive a text back confirming that help is on the way, and requesting them not to send new messages to 999 unless the situation changes

PSAP call takers are duly trained and briefed:

- They are made aware that it takes longer to handle conversations, as the QA exchanged verbally with the Text Relay assistants need to be sent /received as standard SMS texts). Conversations should not last longer than 15 minutes, and by this time help should have arrived for those with a real emergency
- They are advised to use "key points" to minimise the number of messages required.
- A clear ending of the text conversation is important. On top of sending a confirmation of dispatching of resources (if needed), a message should be sent to users requesting them not to send new messages unless there is a change of situation.
- Also, they have clear guidelines for dealing with non-emergency callers (if warnings ignored, their numbers could be blacklisted in the eSMS service and even the relevant mobile network):
  - Abusive callers or those with no clear problem
  - Hoax callers
  - Well-intentioned but non-emergency callers

Taking advantage of the existing eSMS infrastructure, in 2014 the Advanced Mobile Location (AML) was launched in the UK. The following diagram summarizes the high level view of the new service:



**Figure 6: High level view of the AML service in the UK**

Some additional facts:

- The UK eSMS service was developed <sup>25</sup>by Action on Hearing Loss (formerly RNID), BT, Cable & Wireless, the Department of Communities and Local Government, OFCOM, the UK emergency services and all mobile network operators.
- The service launched in September 2009 with a 3-month UK wide trial with genuine users. No equipment changes were needed at PSAPs to receive these messages.
- As of May 2012, there were already 32K phones registered with eSMS.
- Users are recommended<sup>26</sup> to store draft/template messages in their mobile phones with, for instance, their home address (and also advise to PIN or password protect their phones)

<sup>25</sup> [http://www.emergencysms.org.uk/files/3649\\_esms\\_6.pdf](http://www.emergencysms.org.uk/files/3649_esms_6.pdf)

<sup>26</sup> [http://emergencysms.org.uk/questions\\_and\\_answers.php](http://emergencysms.org.uk/questions_and_answers.php)



## 10 Annex 2 – Examples outside Europe

### 10.1 Australia

Within the NG000 (Next Generation Triple Zero) initiatives, Triple Zero (000) is planning on implementing an open eSMS service to the primary emergency service number 000 (they plan to conduct a pilot of the SMS to Triple Zero solution in the next months). Currently there is an SMS relay through the 106 number that can provide relay services to 000 (but recommended only as a last resort for registered deaf and hearing impaired persons).

The main principle of the proposed eSMS service can be summarized as follows: If you can speak, call 000; if not, text 000. SMS is predominantly for the hearing and speech impaired, and/or for people in situations where speaking might be dangerous or not possible. The primary contact shall be via the 000 number (also accessible through 112), and the eSMS capability will be 'nationally' available: A single point of access for the country and no registration required. It shall be free to users, provided their mobile service is active (eSMS will not be available for inactive SIM card - or no SIM card - situations).

Highest priority shall be given to eSMS over other SMS's (where technically capable). The eSMS service will be available on all mobile networks, and its coverage may be broader than for mobile voice based on the lower bandwidth requirement for SMS where voice is not sustainable. The Australian solution will only work with an active service from an Australian MNO, although industry is currently reviewing arrangements for overseas roamers.

While SMS location is not currently possible, there is work under review that may in future mean that a Push solution will be available (location and CLI details shall be provided, as for voice calls). As an alternative and in the interim there is an option to use location from the Emergency+ App or the NZ SMS location solution (mobile locate). The development of Emergency+ App fro including eSMS to 000 capabilities shall include:

- Sending SMS provides validation of a users' mobile number.
- Pre-populate SMS messages (for Police, Fire or Ambulance)
- Include current GPS location
- Take control of users SMS alert settings for "silent SMS"
- Send MMS and include images

It is acknowledged that handling time for the call-taker will be longer for eSMS than for voice. The Emergency Call Person (ECP) / Call Taker for 000 will not act as a relay service for the ES. The SMS will be received by the ECP and be redirected to the right ERO, who will respond to the text request accordingly (once handed off it shall be direct contact to ERO). And nuisance SMS handling capability will be the same as in the current voice process.

The system shall be built with high reliability equipment and with site redundancy. Data will not be encrypted, however SMS works on a point to point basis so unless the ECS SMSC or end device/s are compromised, the data should be secure. The unreliability that is a consequence of using standard store and forward between different network SMSC's is eliminated in the Australian model; there will be a specific SMSC established with data links direct to the PSAPs and ERO's which eliminates the lag and potential lost messages associated with a store and forward approach

Other elements that will be considered include a system acknowledgement for automated receipt of SMS at the PSAP, multi-language support (for languages other than English), catering for satellite phones (if SMS service is available within the mobile satellite services)

In principle, the proposed design removes the cost of SMS transactions between all parties, but of course agencies will have to fund CAD upgrades and staff education. There will be some costs associated with installing the capability in the carrier network but these have yet to be validated and will be dependent on the final design solution.

The relevant stakeholders will consider whether legislative or regulatory changes would be required to facilitate any proposed SMS access process, as the current framework is based on voice calls (the Communications Alliance Industry Code relating to Life Threatening and Unwelcome Communications already applies to communications from mobiles including SMS).

## 10.2 USA

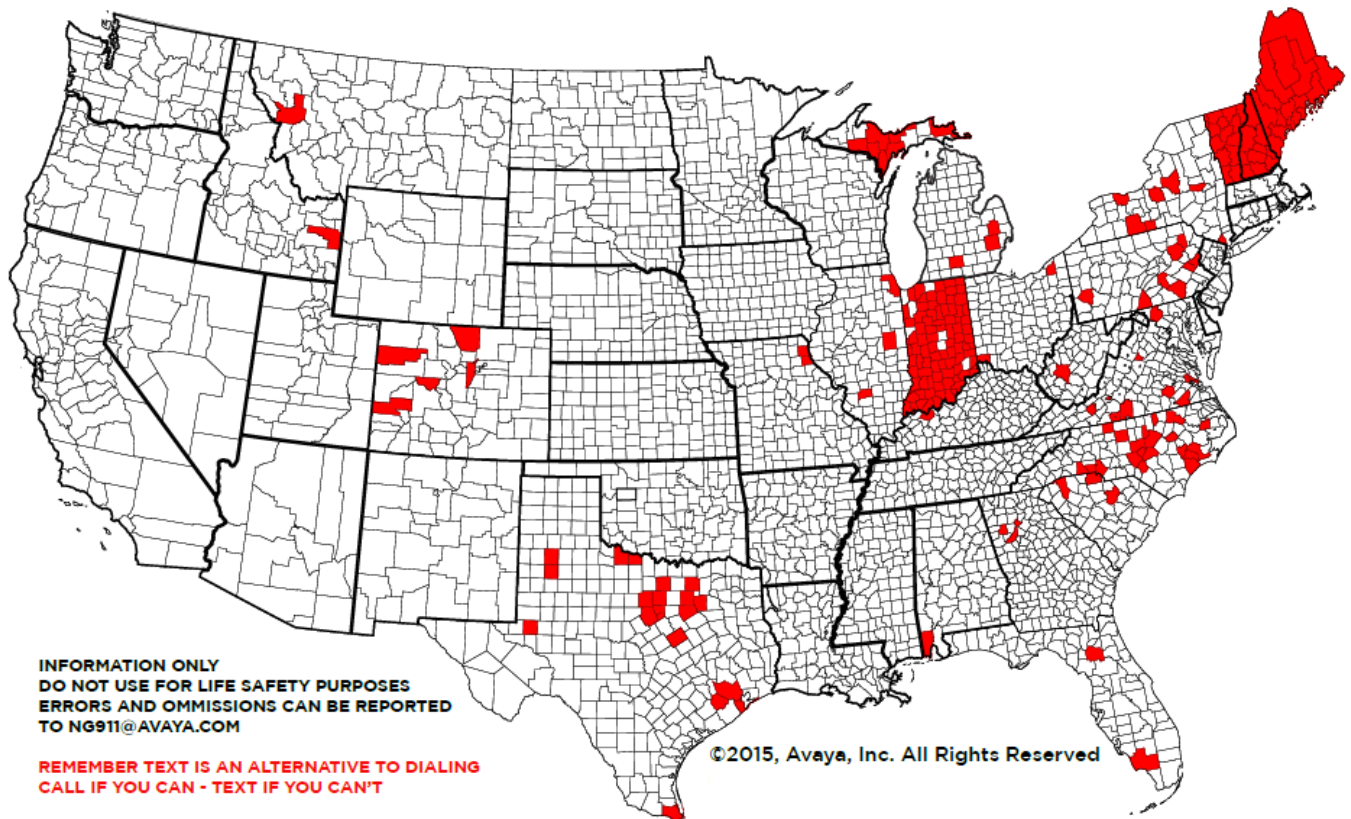
On August 2014<sup>27</sup>, the FCC adopted rules to commence the implementation of text-to-911 service (eSMS) and established an initial deadline (end of 2014) for all covered text providers to be capable of supporting text-to-911 service.

The text-to-911 rules<sup>28</sup> establish that MNO must begin routing eSMS to requesting PSAPs by June 30, 2015 or within six months of a valid PSAP request, whichever is later. A valid PSAP request specifies, among other things, that the PSAP must certify its technical readiness, and an appropriate public authority must have had authorised the PSAP to accept eSMS.

No registration is required, but if someone attempts to send a SMS to 911 in a region where the service is not yet available, FCC rules require all wireless carriers and other text messaging providers to send an automatic "bounce-back" SMS advising users to contact ES by other means (there is a telecommunications relay service for people that are deaf, hard of hearing or have a speech disability). This is intended also to minimise the risk of users mistakenly believing that the SMS has been transmitted to a non-ready PSAP. And even where text-to-911 is available, it is advised that if users can make a voice call to 911, and if it is safe to do so, they should always make a voice call to 911 instead.

There is a centralised database listing those PSAPs that have registered and certified their readiness to receive eSMS, including also PSAPs that began accepting SMS prior to the initial deadline (the four largest MNO in the US had voluntarily committed to make eSMS available by mid-May 2014 in areas where the local 911 PSAPs were prepared to receive eSMS).

The following diagram<sup>29</sup> represents the Text-to-911 readiness of US PSAPs at county-level as of end of May 2015, as reported by the FCC Public Safety and Homeland Security Bureau (in the future, text-to-911 is expected to be widely available in the country).



**Figure 7: FCC reported Text-to-911 readiness by county as of May 27, 2015**

<sup>27</sup> <http://apps.fcc.gov/ecfs/comment/view?id=6018261176>

<sup>28</sup> <https://www.fcc.gov/encyclopedia/psap-text-911-readiness-and-certification>

<sup>29</sup> ©2015, Avaya, Inc. All Rights Reserved. <http://Avaya.com> - May 27, 2015 (used with permission)



## 11 Abbreviations

All definitions of terms and acronyms related to 112 are available in the 112 Terminology EENA Operations Document<sup>30</sup>. For convenience, the ones used in this document are also listed below (in alphabetical order), together with some additional terms.

<b>Acronym</b>	<b>Description</b>
<b>App</b>	Mobile applications
<b>DoS</b>	Denial of Service attacks
<b>EMS</b>	Emergency Medical Services
<b>ERO</b>	Emergency Response Organization
<b>ES</b>	Emergency Services
<b>eSMS</b>	Emergency SMS service (for communication with SMS-ready PSAPs or EROs)
<b>FCC</b>	Federal Communications Commission (USA)
<b>FRS</b>	Fire and Rescue Services
<b>GPS</b>	Global Positioning System
<b>IM</b>	Instant Messaging
<b>MNO</b>	Mobile Network Operator
<b>MS</b>	Member States (European Union)
<b>OTT</b>	Over The Top messaging services
<b>POL</b>	Police
<b>PSAP</b>	Public Safety Answering Point
<b>RTT</b>	Real-time text
<b>SIM</b>	Subscriber identity/identification module card
<b>SMS</b>	Short Message Service (text messaging service)
<b>TC</b>	Total Conversation
<b>WiFi</b>	Any "wireless local area network" (WLAN) product based on the IEEE 802.11 standards

<sup>30</sup> [http://www.eena.org/uploads/gallery/files/operations\\_documents/2012\\_10\\_16\\_112terminology.pdf](http://www.eena.org/uploads/gallery/files/operations_documents/2012_10_16_112terminology.pdf)