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Means to Access 112

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1 Introduction

It is estimated that 320 million[1] emergency calls are made every year in the European Union, enabling emergency services to assist citizens in all sorts of difficult situations. Public safety answering points (PSAPs) are reachable 24 hours a day, all year long. Consequently, PSAPs have to ensure that people who are in life-threatening situations and need urgent assistance are able to contact emergency services. This can mean the difference between life and death for someone in trouble.

All over the world, citizens expect to be able to contact emergency services with technologies they use to communicate every day[2]. For the time being, most European emergency services can only be reached through the public switched telephony or mobile networks. 112 SMS and other means of communication are also possible in some European PSAPs. Furthermore, in the near future, cars will be fitted with telematics systems that automatically initiate a voice call and provide valuable data when a car is involved in an accident (eCall).

The scope of this document is to gather information on the means of accessing 112 and outline some of the 'best practice' approaches from the authorities' perspective. The description of practices was obtained through information sent by EENA members. As a conclusion, recommendations and EENA requirements are described.

2 Abbreviations and Glossary

All definitions of terms and acronyms related to 112 are available in the 112 Terminology EENA Operations Document.[3]

3 Prerequisites to access 112

3.1 Legislation

This chapter gives a general overview of the evolution of the European legislation related to 112 (112 Legislation EENA Operations Document [4]). The Universal Service Directive has been translated to the national legislation in all Member States.

In July 1991, the Council of Ministers of the European Union adopts a decision on 112. Members States were requested to introduce the single European emergency number 112 in order to make emergency services more accessible, especially for travellers. The single European emergency number 112 operates alongside the existing national numbers in most countries and does not replace existing national emergency numbers.

In March 2002, the Universal Service Directive is adopted. The Directive further detailed requirements concerning 112:

- **Free of charge**: Member States must ensure that users of fixed and mobile telephones, including payphones, are able to call 112 free of charge.
- **Non-discrimination**: 112 calls must be appropriately answered and handled, irrespective of whether 112 or other national emergency numbers are dialled.
- **Caller location**: Member States must also ensure that emergency services are able to establish the location of the person calling 112. The ability to locate the caller in case of an emergency may be of great significance in a situation where the person is unable to state his or her location, which can happen particularly when calling from mobile phones or while travelling abroad.
- **Raising awareness:** all EU countries must inform citizens (nationals and visitors) of the existence of 112 and in which circumstances they should call it.

[1] Estimate based on COCOM, EGEA and information provided by EENA emergency services' members
[2] http://www.redcross.org/www-files/Documents/pdf/other/SocialMediaSlideDeck.pdf
[3] 112 Terminology:www.eena.org/view/en/Committees/112operations/index/generalframework.html
[4] 112 Legislation EENA Operations Document: http://www.eena.org/ressource/static/files/2013_07_31-112-and-the-eu-legislative-framework-final_.pdf

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It is also worth motioning that the Directive on privacy and electronic communications (Directive 2002/58/EC) indicates that Member States may adopt specific provisions to entitle providers of electronic communications services to provide access to calling line identification and location data without the prior consent of the users or subscribers concerned.

In December 2009, the new Universal Service Directive ensures that European citizens gain better access to emergency services by extending the 112 access requirements from traditional telephony to new technologies (such as VoIP), strengthening operators' obligation to provide information about caller location to emergency authorities and improving access to 112 for people with disabilities.

In article 26.4 of the USD there is special attention regarding access for people with a communication disability, one specific item is equivalence of regular telecommunication services for all (including public services in case of an emergency).

3.2 Standards

There are many standards regarding telecommunication. In this table we tried to mention the most relevant standards regarding access to emergency services with the different media types that are commonly used.

Subject	Short description	Standard	Link
Multimedia access to ES	IMS standard for Multimedia Telephony	TS 122 173 Multi Media Telephony Level 1	ftp://ftp.3gpp.org/specs/2009-09/Rel-9/22_series/22173-930.zip
Multi media access to ES	IMS standard for Multimedia Telephony	TS 126 114 Multi Media Telephony Media aspects	http://www.3gpp.org/ftp/Specs/2007-03/Rel-7/26_series/26114-700.zip
Multi media access to ES	Framework for Emergency Calling using Internet Multimedia	IETF ECRIT	http://tools.ietf.org/html/draft-ietf-ecrit-framework-10
Access ES trough relay service	Harmonized Relay Services	ETSI ES 202 975	http://pda.etsi.org/pda/home.asp?wki_id=SaBr031GuKMONMQOMMtud
Total conversation	Coding	ITU-T REC-F.703 (recommandation)	http://www.itu.int/rec/T-REC-F.703/en
RTT (real time text)	Framework of requirements for real-time text conversation using SIP	RFC 5194	http://tools.ietf.org/html/rfc5194
RTT (real time text)	Coding and presentation standard	ITU-T T.140	http://www.itu.int/rec/T-REC-T.140/en
RTT (real time text)	RTP Payload standard	IETF RFC4103	http://tools.ietf.org/html/rfc4103
Video access to ES	Coding	ITU-T H.263	http://www.itu.int/rec/T-REC-H.263/
Video access to ES	IETF Standard	IETF RFC 4629	http://tools.ietf.org/html/rfc4629
Video access to ES	Coding	ITU-T H.264	http://www.itu.int/rec/T-REC-H.264
Video access to ES	IETF Standard	IETF RFC3984	http://www.ietf.org/rfc/rfc3984.txt
Audio access to ES	Coding	ITU-T G.711 A-law audio	http://www.itu.int/rec/T-REC-G.711/en
Audio access to ES	IETF standard	IETF RFC 3551	http://www.ietf.org/rfc/rfc3551.txt

3.3 Knowledge of 112 number

In an emergency situation, the citizen may not be in a position to search and establish the appropriate emergency number to call. This number should be previously known so it can be dialled immediately in case of need. This is the reason why education of citizens and dissemination of information about the European emergency number is crucial.

The knowledge of the 112 emergency number is not as wide as desirable. The results of the European Emergency Number 112 Eurobarometer survey[5] speak for themselves: only about 50% of the citizens would call 112 in the event of emergencies in their own country and more than 75% would not use 112 in case of an emergency in another EU country.

The European dimension of 112 should be communicated to all citizens. It is important that travellers are informed about the availability of the European emergency number. Most people travelling abroad do not even think about the possibility of being involved in an emergency situation during their journey. This is why authorities cannot count into travellers' own initiative to find out what number to use in case of emergency. Campaigns and dissemination efforts are needed to ensure that travellers know what emergency number to use in case of distress.

3.4 Devices

To be able to alert the emergency services a variety of devices is available. In this paragraph we give a short description of the devices and their capabilities. More extensive details are given in the chapters following.

Fixed line phones (Analogue)
Fixed line phones are used to access emergency services with voice. Some of these phones also have the capability to send and receive SMS messages.

Mobile phones (Regular)
Mobile phones are used to access emergency services with voice. Mobile phones also have the capability to send and receive SMS messages.

Mobile phones (Smart)
The basic functionality of the (smart-)phone is used to access emergency services with voice and/or with SMS messaged in the same way that regular mobile phones are used.

Besides this functionality smart phones are also powerful computers that have the capability to use complex applications to acquire and share information; they also regularly have GPS (global positioning system) capabilities.

The smart-phone can be used to support other means of communications such as video and photos. These multimedia functionalities can be used to support people with communication impairments (sign language/lip reading), share more information regarding the emergency or even give the PSAP eyes on site.

Video phones (Internet connected)
Although nowadays they are also available as mobile device, video phones are mainly connected to the internet at home and used by people with a hearing and/or speech impairment. The video phone is used to be able to communicate with sign language/lip reading supported by real time (or chat) text and voice. To be able to handle calls, call takers need to be trained in the use of sign language or an interpreter service must be in place to translate the sign language into voice and vice versa.

Computers/laptops
More and more computers are used for day to day communication with others. With that more and more the possibility to access the emergency services is expected. Besides using the computer as a substitute for landline phones and mobile phones they can also be used as a substitute for fixed line videophones and other total conversation devices. The main issue with the use of computers to access emergency service is the anonymity of the user and the almost impossible location determination of ip-based devices without GPS capabilities.

[5] Eurobarometer: The European Emergency Number 112 [http://ec.europa.eu/public_opinion/flash/fl_339_en.pdf]

Location based devices
In some countries location based devices are supported.

They are used by people with a medical condition which prevents them to fully communicate with the emergency services with voice. Aphasia is an example of this. With the use of a panic button or even with a simple workflow diagram, which the person can use to explain what is happening, the emergency services can be alerted. This device is pre-registered and the necessary information regarding the person is instantly available at the PSAP. Because of the difficulty in the communication, the device has GPS capabilities which it uses to pinpoint the location of the caller. After the exchange of information a regular voice connection is opened to be able to hear what is happening and to get as much information as possible.

Another example of a location based device is eCall which is also used to pinpoint the emergency. eCall devices are triggered by sensors or manually by the driver. They have the possibility to exchange information with the PSAP regarding the exact nature of the accident, the type of car and potential number of people involved. After the exchange of information a regular voice connection is setup to be able to communicate with the people on site.

3.5 Network

The second step in the access towards emergency services is the network to connect the device to the PSAP. In this chapter we will shortly touch the different network types and the measures that need to be taken to assure access to the emergency service for all and with all means.

Landline networks
The access to emergency services is primarily based on landlines. So using landlines with regular connected phones give the most assurance that all the information needed to send the first responders to the right location and to have information about the subscriber is arranged for by the network provider. Because of the nature of landlines it is also possible to easily determine the closest PSAP and so being able to automatically connect a person in an emergency to the appropriate PSAP.

Mobile networks
Around 80 to 90 percent of all emergency calls are now made with mobile phones (voice) and this number is still rising. Even when a landline phone is available most people prefer to call with their mobile phones. Efforts have been made to make the information that is needed to support emergency calling available. Especially the accuracy of location information that should be determined by the network provider is still an issue. The accuracy issue and the technological setup of the mobile network make harder to automatically connect the person in an emergency to the closest or appropriate PSAP. Because of this, some countries have implemented a first level PSAP to determine the location and type of emergency and in that way connect the person to the appropriate second line PSAP.

A second issue with mobile networks is the coverage. Not all providers have 100% coverage in a country and, consequently, being able to call in case of an emergency is not always guaranteed. The possibility for domestic mobile users to access 112 when they are out their home network coverage by using another available domestic mobile network (what is known as 'national roaming') should be available in all countries. Of course the same measures (international roaming) should also be in place for people visiting a country where their provider does not provide mobile network services.

Ip based networks
Voice over Internet Protocol (VoIP) based devices and applications have become commonplace. Citizens use them to conveniently communicate, send and receive information. IP connectivity is necessary to communicate with media such as VoIP, video and real time text. Also this is the connectivity protocol used to exchange information between applications.

Corporate and campus networks
Large companies, universities and other organisations interconnect their local area networks and build campus or corporate networks. Many companies are integrating Voice over IP (VoIP) into their networks.

4 Means of access to 112

4.1 Voice calls

Nowadays, emergency services usually accept to be contacted by voice only through phone calls. Phone calls can be made through mobile, landline and internet networks.

4.1.1 Mobile phones

The use of the mobile telephone to access the emergency services in Europe outweighs other channels. As it was mentioned in the previous section, network coverage has to be available to assure the communication.

Citizen can dial 112 directly using their mobile device. In all mobile phones, even if the device is blocked, the user will be able to start a call to 112. Additionally, in case a normal call with another person is taking place and the user dials 112, the call will be stopped and the citizen will be connected to the most appropriate PSAP.

Once the citizen dials 112, the call is prioritised in the network. Furthermore, the call number identification (CLI) and the location are sent to the PSAP. The accuracy of the caller location depends on the mobile network operators technical capabilities and means to share this information with the emergency services.
This is the normal situation, but as described in the "Caller location in support of emergency services" and in "False emergency calls" EENA Operations documents[6] there are some cases where the PSAP might not receive this information.

CLI can be used by emergency services to trace the owner of the phone. But, whether the information of the caller is available or not depends on the subscription of the user. For example pre-paid phones do not always have a registered owner/user.

It is worth mentioning the growth of the use of smart phones applications that connect to emergency services. With the processor capacity of the smart-phone and connections they are able to use applications to communicate extra information with to emergency services. We see some applications being introduced to retrieve more accurate location information with the support of the GPS capabilities and supporting applications to deliver this and potentially other lifesaving information to the emergency services.

In some countries this kind of application is already available to be installed in their citizens' smart phones. Unfortunately, most of the time they can only be used locally because of the lack of a pan-European standards and the need for changes in the PSAP to receive and handle the extra information.

4.1.2 Landline phones

Citizen can also communicate with emergency services using their landline phones. As it happens in mobile telephones, in case of 112 dialling during another conversation, the call is interrupted and the citizen is directly connected to the most appropriate PSAP. Location and CLI are also available for emergency services.

In some landline telephones, a quick button (for example a 'red button') is available. In case of emergency, the person has only to push this button and the communication with PSAP starts.

A special case of landline phones are **campus networks** that are used in large enterprises or other organisations. These phone connections have to pass through a central switchboard before being connected to the external phone network. Users of campus networks expect to be able to place an emergency call from a campus or building with a complex environment and have a first line response dispatched to the specific location. Depending on the physical layout of the building, the response area may be a building within a campus or a floor in a building or an office on a floor.

Considerations for alerting local staff that an emergency call has taken place, and from where it originated, can be extremely useful for coordinating an emergency response.

[6] Caller location in support of emergency services EENA Operations Document –
False emergency calls EENA Operations Document -
http://www.eena.org/view/en/Committees/112operations/index.html

It also worth mentioning that in some organisation it is necessary to dial another digit before the emergency number 112 (for example '0' or '9'). This can be extremely dangerous, because the person in distress may not know what number he or she has to dial. For this reason, 112 should be able to be dialled both with and without access codes, and the proper signage should be visible in public areas, or on the device itself. The 112 number should never be assigned to internal extensions (for example in a hotel the 112 was assigned to the bar).

4.1.3 Calls using IP telephony

The use of IP telephony is increasing day by day. The service is available for desktop computers, notebook and tablet computers and other mobile devices, including mobile phones or dedicated phones. In most countries, these service providers do not give access to emergency services, even if citizens expect to be able to contact emergency services using the same devices or software they use in their daily life.

Special care should be given to these devices, as they are often relocated by the user without administrative approval or knowledge, and this could cause the Caller ID number and the correlating location database to not be in sync.

4.1.4 Other voice communication

In some countries satellite phones are still commonly used. But the connectivity to the 112 process is not always arranged for. Also information such as caller identification and caller location is often lacking.

For emergencies on water Maritime Radio is used to call for help in an emergency (where mobile phone coverage is not available). For this a special process is in place. When there is a need for the dispatch of "regular" first responders the coastguard is mainly the one to contact 112 and coordinate the initial assessment and communication. In fact you could see the coast guard as a relay service for these situations. Of course in most cases the coast guard takes their own measures because the dispatch of water vehicles is necessary.

4.2 Text only calls

4.2.1 SMS

In the last couple of years services enabling SMS to 112 have been or are being deployed all over Europe, for instance in Estonia, Iceland, Luxembourg, Sweden, Ireland, The United Kingdom and in some Spanish regions. In most cases these services where initiated to support people with communication impairments and especially the deaf and hard of hearing. In some cases SMS is only available for people with disabilities in order to make 112 accessible for them, in others all citizen can contact emergency services using SMS. The latter can be used in so called "silent call" situations or very low coverage situations such as mountains and rural areas. They highlight the need for text-based communications in emergency situations. Although every step forward for access to emergency services for people with disabilities is applauded it is clear that the SMS service is not a full implementation of the equivalent services as meant in the USD article 26.4.

For more detailed information we like to reference the "SMS Access to 112" EENA Operations Document[7].

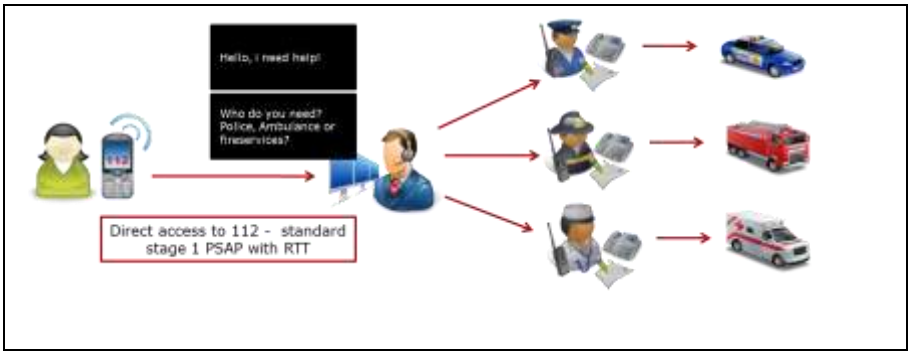
4.2.2 Real time text only

There are several services deployed in Europe that are based on Real Time Text (RTT). RTT is a communication form where text is not send by sentence or by complete message but letter for letter and both ways. This means that the communication is much closer to voice calling than message based services as SMS and chat services. The fact that there is an actual call setup and thus a clear pick up by the called person or service makes that the attention value of the call is much higher than a message or a chat message.

It might seem that RTT is a new service but that is not the case. This service already exists for many years and was even used in a lot of countries. But the mostly analogue based text phones, which were also used for example by stockbrokers and news agencies (minitel in France is an example of this), became less wanted with the introduction of personal computers, internet and mail. With only the people with impairments left as users for these devices also the commercial foundry was lost. Most countries phased out these services and did not replace it with other devices and services for these user groups.

Some new services and applications where implemented with the introduction of mobile phones with text capabilities. In the UK the text to speech service which was already in place for older analogue systems was adapted to be able to handle these calls. But only with the introduction of mobile (smart) phones with full keyboard functionality this service became a service that could be seen as a good step forward to equivalence in service. Examples of this are the Blackberry service and the current android service in The Netherlands and the Nokia service that was introduced in Sweden.

Shown below the setup as used in the first level PSAP in the Netherlands



[7] http://www.eena.org/ressource/static/files/2012_06_18_2-1-1_sms_v1.0.pdf

With the penetration of the market with internet connectivity via a smart phone and the availability of toolboxes to develop applications on the smart phone the number of application that support RTT and so make the service available for all including the group of people that need text communication for day to day communication is becoming easier. There is need for changes at the PSAP side to be able to handle these RTT calls. Standards for the connectivity and handling have not changed and are available (RFC4103).

4.3 Calls with combination of media forms

4.3.1 Total conversation

When we talk about communication we mean communication with a combination of video, real time text and voice. Total conversation is not about sharing photo's, videos, text messages and voice messages. It is about streaming media where a combination of the text, voice and/or video is used as a conversational means of communicating.

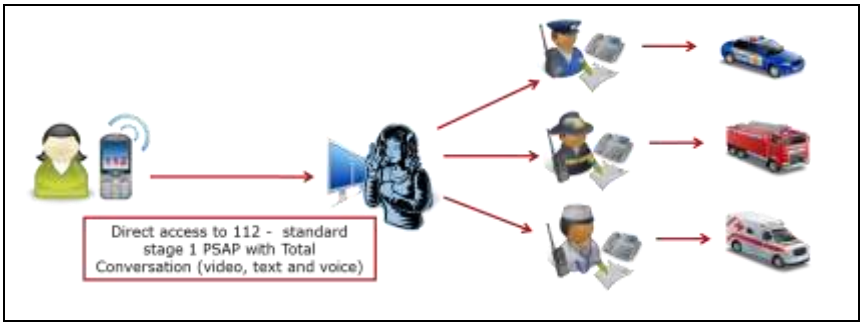
Total conversation is not new. For many years video phones with text and voice capabilities are used by deaf and hard of hearing people to communicate with each other. These same devices are also used in (mostly business) environments for video conferencing.

In the Reach 112 project a lot of research was done on the equivalence of service as mentioned in the universal service directive and the conclusion was that the user groups relying on text services find that real time texting is a much richer and more equivalent service than message based services and chat services.

With the introduction of personal computers with webcams and (mobile) broadband internet the technology is now allowing conversations with video and thus with sign language for everyone which is truly equivalent for people that use sign language as their primary language. Sign language varies often from country to country and region to region. Because of this great variety in languages, supporting this (sign language) on a European level is going to be challenging although technological boundaries regarding video calling are disappearing. Different setups are possible to support sign language.

Direct access

The first setup is direct access to the PSAP with a Sign language interpreter or native sign language speaker as call taker within the PSAP. This model is being used in the new setup 114 PSAP in Grenoble France. When we compare the different models this model is the closest to equality of service with regular voice calls. To implement this model, infrastructural changes, making sure that all devices are able to call the emergency service and education of the sign language within the PSAP is needed.



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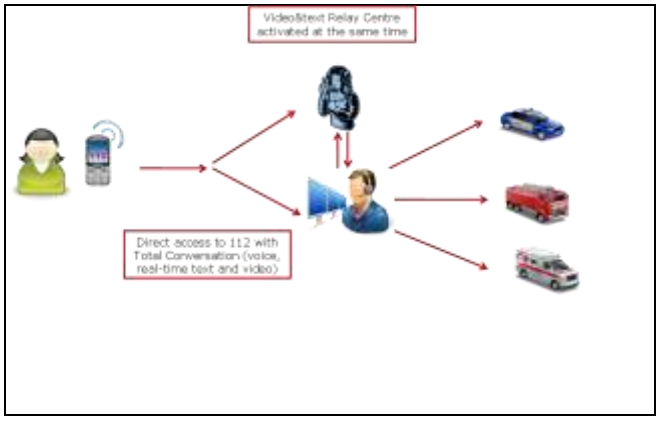
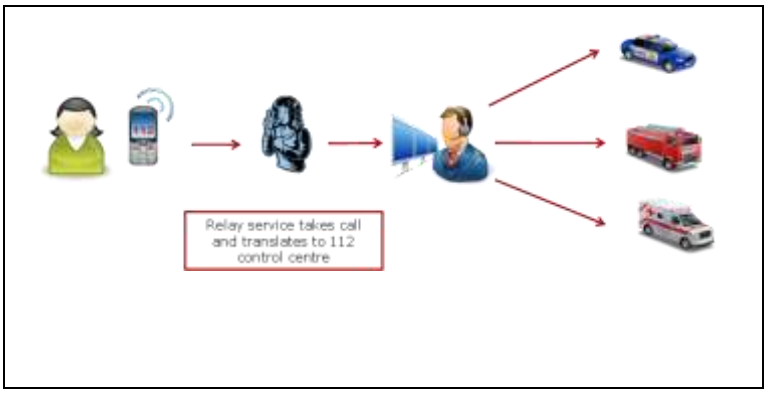
Direct access with interpreter inclusion

This setup has direct access to the PSAP but with an automated inclusion of a sign language interpreter as shown below. This model was used as a pilot within the REACH112 project in Sweden. To implement this model infrastructural changes are needed in the PSAP. A big advantage is that there is no need for special/extra skills for the call takers in the PSAP. Education how to handle and knowledge about the user group is of course needed.



Indirect access with a relay service

This third model uses a third party service as interpreting service between the caller and the PSAP as shown below. Although this seems sub optimal there are some appealing arguments to use this model. The sign language interpreters use sign language every day, so the quality of interpretation will be of the highest quality. Second there is no need for any process or infrastructural changes in the emergency handling chain.



Within the European REACH 112 project all three models where used and all where assessed as being viable solutions. Which model to implement depends on a lot of different aspects like what kind of devices the user group uses, how adaptive the PSAP is in regards to infrastructure and learning the sign language skill and of course the availability of a sign language interpreting service or relay service which can be used by the user group.

For more information on these models, user group research, technology, standards and business aspects we like to refer to the information site that the REACH112 project created (www.reach112.eu).

4.3.2 Location based systems

With location based systems we mean systems that are primarily used to automatically give an as exact as possible location of the caller or the emergency. The reason that these systems are used in mostly for people that can not communicate with voice or where extra information is needed in the emergency handling process to handle the emergency adequate. Examples of this are people with mental health problems, elderly people that have known health problems that need immediate attention and automated systems such as eCall that deliver location information and relevant data to the emergency services. In most cases the system alerts the emergency services where it will identify the caller and deliver GPS based location information. After this sharing of data it will open a voice channel for additional support.

Examples are MySoS which is used in The Netherlands for people that have Aphasia.

Another example which will be used throughout Europe is eCall which is used as a car emergency system. For more information on eCall we would like to refer the HeERO project (www.heero.pilot.eu) that is running and implements pilot environments for eCall and to the eCall EENA Operations document.[8]

4.4 Social Media

Social media is a fast growing phenomenon that is shifting the way people communicate. Citizens share observations, opinions and emotions through social networks, even in emergency or crisis situations.

For the time being, most emergency services use social media as listeners. This way they can be aware of potential emergency situations due for example to an unofficial mass demonstration. It is also worth mentioning that, in case of big disasters, the use of the information given by citizens in social media is very valuable for emergency services.

In some countries, PSAPs share news and information in their social media profiles. Additionally, they use this channel of communication with educational purpose.

Nowadays, emergency services do not accept emergency situation notifications (we cannot speak about emergency 'calls' in this case) through social media. The non-availability of the location and the possibility of the increase the number of false emergency warnings prevent them from opening the social media channel.

[8] eCall EENA Operations Document: http://www.eena.org/ressource/static/files/2012_04_04_3_1_5_ecall_v1.6.pdf

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5 European examples

In the next table, data related to the access to 112 are described. The source of these data is the COCOM report published in 2013.

Country	112 available over any other domestic mobile network when out of coverage of the home network	112 available from handsets without SIM cards	Access to 112 by means other than voice communication	Call set-up time (average)
Austria	Yes	Yes	No	ESTIMATED: Less than 1 sec. in the fixed network of the incumbent and 1 to 3 sec. in mobile networks. Time in which the fastest 95% is set up: 1,5 seconds in the fixed network of the incumbent
Belgium	Yes	No	Voice and fax communications to 112/100/101 are possible. Access by SMS to 100/101/112 will be available in the future, but only for a limited group of identified deaf and hearing impaired people	N/A
Bulgaria	Yes	No	No	MEASURED: Average call set-up time in seconds: Fixed – 0.88 sec. Mobile – 3.78 sec. Time in which the fastest 95% of calls are set up: Fixed – 0.83 sec. Mobile – 1.60 sec. Time frame:1 month Number of calls: Fixed - 67 363 calls Mobile - 549 348 calls
Cyprus	There are no legal provisions for the above. However, despite the fact that Cyta's customers cannot use another available network; this is not considered a problem since the network of Cyta covers 99% of the island. The same goes for Primetel customers, since Primetel is an MVNO on Cyta network. On the other hand MTN customers can use Cyta's network	Yes	Telefax or SMS on incumbets' dedicated number	MEASURED: Mobile: Average call set-up time in seconds: Time in which the fastest 95% of calls are set up: Cyta: N/A, MTN: 6,28 sec Fixed: Average call set-up time in seconds: Cyta: 1,14 sec., Cabelnet: 2 sec. Time in which the fastest 95% of calls are set up: Cyta: 2 sec. Weighted average: 1.0832
Czech Republic	Yes	Yes	No	MEASURED: Average call set-up time in seconds: Fix 0,68 sec; Mobile 0,63 sec Time in which the fastest 95% of calls are set up: 0,9 sec; Mobile 0,8 sec
Denmark	Yes	Yes	SMS	ESTIMATED: 20 sec.
Estonia	Yes. But it is recommended to remove SIM card first, because it may be that some phone models does not support that functionality.	Yes	disabled people can contact ERC use fax and SMS	ESTIMATED: 2.5 sec. Time in which the fastest: 95% of calls are set up: 2 sec

Finland	Yes	Yes	SMS using a different GSM number – advertised to disabled users	n/a
France	Yes	No	No to 112, but as of 14.09.2011 SMS and fax is available for deaf and hard of hearing people on a nationwide 114 number	n/a
Germany	Yes	No	Fax for hearing-impaired.	ESTIMATED: 2-5 sec
Greece	Yes	Yes	No, but some mobile operators are technically ready to provide SMS access if required.	ESTIMATED: For mobile operators: from 1,47 sec to 9 sec. depending on the operator for fixed operators: from 0,6 sec
Hungary	Yes	Yes	SMS and e-mail is available, but practically not used or very rarely.	n/a
Ireland	Yes	Yes	Minicom and SMS services	MEASURED: 3.13 sec. Fastest 95%: 2,1 sec
Italy	Yes	Yes	No, but some trials are on-going regionally	Estimated average: 3,75 sec
Latvia	Yes	Yes	112 can be accessed by sending sms (technical solution for end-users with hearing and speech disabilities). End-users with hearing and speech disabilities who are subscribers of fixed operators have possibility to access 112 through special terminal equipment. People with vision disabilities can access 112 by using Braille terminal equipment	ESTIMATED: 6 sec. Time in which the fastest 95% of calls are set up: 6 sec. Time: 1 July 2011-1 July 2012: 112 Call centre in Riga
Lithuania	Yes	Yes	No, starting 112 SMS project for people with disabilities	ESTIMATED: 4,28 sec. Average Time in which the fastest 95% of calls are set up: 3,85 sec.
Luxembourg	Yes	Yes	SMS(see www.112.public.lu)or by Fax	MEASURED: LOL: 1 sec. / 95% of calls within 1 sec. Orange: 4 – 5 sec. / 95% of calls within 4 sec. Visual Online: 8 sec / 95% of calls within 3 sec. Voipgate: 0,3 sec / 95% of calls within 0,4 sec. LOL: average 150 calls per month. Orange: manually testing of a set of 10 calls. Voipgate: one year ESTIMATED: EPT Mobile Network: average set-up: 2 sec. where 95% of calls are setup in 1,5 sec EPT Fixed Network: average set-up: 0,401 sec. where 95% of calls setup in 0,385 sec. Tango Mobile: average set-up: 4,68 sec. where 95% of calls are setup in 4,03 sec.
Malta	Yes, in all cases	Yes	No	MEASURED: 2 sec. Time: 7 days Calls: 17000 (fixed and mobile)
The Netherlands	Yes	Yes	Real time text since May 2011. For analogue text phone users a free of charge emergency number 0800-8112	Estimated average: 1-3 sec
Poland	Yes, but there are still some malfunctions	Yes	No, under consideration	n/a

Portugal	Yes	Yes	SMS solution for deaf people, through a specific number (+351 961010200), operated by the National Guard	MEASURED: 1,51sec
Romania	Yes	No	SMS in testing, Fax with predefined forms Regional pilot with video telephony	n/a
Slovakia	No	Yes	No	ESTIMATED: 2 sec. Time in which the fastest 95% of calls are set up: 5 sec Time period – few years, number of PSAPs – eight (PSAP in Bratislava, Trnava, Nitra, Trenčín, Žilina, Banská Bystrica, Prešov and Košice city), all calls covered
Slovenia	Yes	No	WAP112 service is available - text emergency call to 112. Introducing SMS as well as video.	MEASURED: Average call set-up time in seconds: 2,29 sec in fix networks 2,23 sec in mobile networks Time in which the fastest 95% of calls are set up: 6,2 sec in fix networks 3,85 sec in mobile networks
Spain	Yes	Yes	Most centres allow SMS, Chat or fax. Access via SMS or chat is directed to people with hearing impairment. Communication is not made to 112 but to a geographic number.	MEASURED: Average call set-up time in seconds: ___ sec. 2.02 fixed(01/07/2012 – 31/08/2012) 3.06 sec mobile (01/07/2011 – 01/07/2012) Time in which the fastest 95% of calls are set up: 7.8 sec.fixed (01/07/2012 – 31/08/2012) 4.07 sec.mobile (01/07/2011 – 01/07/2012)
Sweden	Yes	Yes	SMS service is intended for persons with disabilities. The users must be registered before using it.	n/a
United Kingdom	Yes	No	a. via SMS – requires pre-registration of the calling number b. via text relay using appropriate terminals using ITU v21 over the PSTN (with access code 18000).	Call set up time for 999 calls in the UK is extremely short on all networks. For 112 calls call set up time on some landline networks is delayed by 4 seconds to avoid "phantom calls".
Croatia	Yes	No	No. Plans for SMS	MEASURED: Average call set-up time in seconds: 1,47 sec. Time in which the fastest 95% of calls are set up: 2,02 sec.
Iceland	Yes	Yes	SMS	n/a
Liechtenstein	Yes	Yes/No	No	Estimated from 0.4 - 5 sec
Norway	Yes	Yes	SMS to number 2080 which is not dedicated for emergency but SMSs to this number will be handled.	n/a

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6 EENA recommendations

As a summary of this document EENA would like to make recommendations about how to improve access to 112 and inform the stakeholders that are involved. It is not intended that all measures are to be taken in all cases.

Stakeholders	Actions
European Authorities	Take appropriate measures to: - increase the knowledge of the 112 number - give direct access to number '112' in campus networks - ensure an equivalent access to 112 for people with communication impairments - increase the accuracy of caller location in support of emergency services
National telecommunication regulator Network operators	Take appropriate measures to: - ensure 112 access' availability over any other domestic mobile network when out of coverage of the home network. - guarantee a minimum call set-up time for 112 calls - guarantee a 100% network coverage
Telecommunication operators	Take appropriate measures to: - ensure 112 access' availability over any other domestic mobile network when out of coverage of the home network. - guarantee a minimum call set-up time for 112 calls - guarantee a 100% network coverage
National / Regional Authorities	Take pro active actions to ensure access to 112 Take appropriate measures to increase the knowledge of the 112 number Ensuring that the appropriate measures are taken in campus / business networks
Owner of the campus / business network	Take appropriate measures to: - ensure 112 access both with and without access codes - provide proper routing based on device location - provide local notification of emergency call events - provide user training and placards where appropriate
Emergency services	Take pro active actions to implement other means of accessing 112 than voice-calls

7 EENA Requirements

Requirements	
Access to the PSAP by other means of communication than only voice-calls	Compulsory
Equivalent access to emergency services for people with communication impairments	Compulsory