Location information for emergency calls from mobile phones

Statement

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About this document

This document concerns the ability of emergency authorities (such as the Police, Fire and Rescue service, Ambulance and Coastguard) to identify the location of people making 999 or 112 calls. Accurate and reliable location information significantly helps the emergency authorities in delivering urgent assistance to those in need.

Last year, we published a Call for Inputs seeking views and evidence from stakeholders as to whether our regulation needed to be revised to improve the information that the emergency authorities currently receive.

The Call for Inputs focussed on location information for callers using mobile phones as we considered that this represented the area in which enhanced accuracy and reliability might be most needed. Emergency calls made from conventional landlines (which are traditionally fixed to a specific address) means that location information passed to the emergency authorities is already almost invariably accurate.

Since our Call for Inputs, the UK mobile industry has concluded trials of a new approach to providing location information which is now beginning to be implemented by operators and mobile handset manufacturers. In this document we welcome this industry initiative and intend to monitor how it develops. At this stage, therefore, we propose not to take any further formal action.

Location information for emergency calls from mobile phones

1.1 Emergency calling has been and continues to be a critical part of the provision of telecommunications services in the UK. The '999' (or '112') service handles around 36 million calls per year; two thirds of which come from mobile phones.

1.2 The ability to locate the caller is a vital element of emergency call handling and routing; firstly it allows the call handling agent ("CHA") to ensure that the call is delivered to the emergency call centre responsible for the geographic area of the caller and then to quickly dispatch emergency assistance to the correct location.

1.3 Historically, traditional landlines were fixed to a specific address, which meant that the location information passed to the emergency authorities ("EAs") was almost invariably accurate. However, as people use new technologies such as mobile phones as their preferred method of calling, the accuracy of the location information provided can be significantly lower.

1.4 Calls from mobile phones in particular can normally only locate a caller to the serving mobile mast and its respective coverage footprint (known as Cell Identification, or Cell-ID, information), which in some cases can encompass very large areas. Therefore, for callers from mobile phones, the precise location of the caller is normally confirmed verbally with the emergency call handler. This can result in call handling times associated with mobile phones taking around 30 seconds longer to complete compared with calls from fixed line phones. If the caller is in distress then the call can take up to 3 minutes longer to complete than for fixed line calls[1].

1.5 In addition it is sometimes not possible for the caller to confirm their location to the emergency authorities either because they are unable to communicate or because they do not know precisely where they are. In such circumstances the emergency authorities are almost entirely dependent on information provided by the Communications Providers ("CPs").

1.6 However, many mobile phones have inbuilt capabilities to determine their location to very high precision, using, among other things, satellite navigation techniques such as GPS.[2]

1.7 Given the importance of emergency call handling, specific obligations have already been imposed on CPs[3] that apply to the accuracy and reliability of emergency caller location information ("ECLI") for mobile calls, which regulations require that the CPs both:

[1] See paragraph 3.10 of our Call for Inputs.
[2] GPS means Global Positioning System. It is the US satellite navigation system. Other systems include those from Russia (GLONASS), Europe (Galileo) and China (Beidou).
[3] A "Communications Provider" is defined for the purposes of the regulation relevant in this context (i.e. General Condition 4) as a "person who provides End-Users with an Electronic Communications Service, or provides access to such a service by means of a Pay Telephone, for originating calls to a number or numbers in the National Telephone Numbering Plan but shall exclude any Click to Call Service."

- "*to the extent technically feasible, make accurate and reliable Caller Location Information available for all calls to the emergency call numbers "112" and "999", at no charge to the Emergency Organisations handling those calls, at the time the call is answered by those organisations*" (General Condition 4.2); and

- "*using a Mobile Network, the Caller Location Information must include, at least, the Cell Identification of the cell from which the call is being made, or in exceptional circumstances the Zone Code*[4]" (General Condition 4.3(b)), i.e. the minimum criteria for ECLI for mobile calls.

1.8 When we revised the terms of GC4 in May 2011, we indicated that we would review the criteria set out in light of possible advances in technology and changes in phone usage. To assist us in the review process, we commissioned an independent report into available technologies and associated approaches to provide more accurate caller location for mobile phones.[5]

1.9 In October 2013, we published this report as an annex to a Call for Inputs that sought feedback from stakeholders also regarding the matters raised in the report. Furthermore, the Call for Inputs asked stakeholders to provide us with their views and associated evidence regarding the current provision of location information, with a particular focus on ECLI for mobile calls. The questions centred on three main themes:

- What (if any) concerns currently exist with respect to the a) accuracy; and b) reliability of ECLI for mobile calls?

- Are there any technologies which might potentially address those concerns?

- How might the Ofcom revise criteria set down in GC4 in order to take account of any new technologies?

1.10 We received nine responses, and for which we would like to express our appreciation, representing the views of the mobile network operators ("MNOs"), CPs, the emergency authorities, equipment/systems manufacturers and individuals.

Revising the General Conditions

1.11 As regards to any potential concerns relating to the current minimum criteria, responses from the EAs reiterated much of the information we provided in the Call for Inputs regarding the additional call handling timescales associated with calls from mobile phones. Almost all responses from stakeholders, including those from the EAs, highlighted the benefits that could be realised from the provision of caller location information that is more accurate than the Cell-ID information currently provided.

1.12 However, while the majority of the responses indicated that improved ECLI for mobile calls would be beneficial and desirable, we did not receive any response or evidence pointing to anything specific in respect of ECLI for mobile calls that needs

[4] From GC4.4 (d) "Zone Code" means a code which identifies the geographic region in which the call was originated.
[5] Assessment of Mobile Location Technology – Update, Jul 2012. http://stakeholders.ofcom.org.uk/binaries/consultations/emergency-mobiles-cfi/annexes/mobile-location-technology.pdf

to be changed at this time, particularly in relation to the minimum criteria for ECLI for mobile calls in General Condition 4.3(b).

1.13 We have concluded that there is neither a reason, nor any associated evidence, to warrant changing the regulatory obligations imposed on CPs under General Condition 4 at this stage. In reaching this view, we have carefully considered the responses received. We have also taken into account the current regulatory obligations imposed on CPs, noting in particular that General Condition 4.2 always requires that "*The Communications Provider shall, to the extent technically feasible, make accurate and reliable Caller Location Information available for all calls to the emergency call numbers "112" and "999", … at the time the call is answered by those organisations.*" That obligation is supplemented by the minimum criteria for ECLI for mobile calls in General Condition 4.3(b), and we would need to be clear what (if any) specific changes might be required to these criteria as our general (statutory) duties require, among other things, that our regulatory intervention should be proportionate and targeted only at cases in which action is needed.

1.14 We have also taken into account recent industry developments, which we discuss below. In doing so, we have had regard to the desirability of promoting and facilitating the development and use of effective forms of self-regulation. This is a relevant consideration forming part of our statutory duties. While we are not yet in a position to assess whether the recent developments will be effective to improve ECLI for mobile calls, we consider that it is appropriate to monitor the situation for now, as discussed further below, before considering whether to take any regulatory action. We also consider that this approach is appropriate in light of Ofcom's own regulatory principles.[6]

Recent industry developments

1.15 During the course of this consultation, the further development and testing of a specific (handset-based) approach to improving the accuracy of mobile location information has taken place. The details of this approach have been discussed previously in the research report from Mott Macdonald (see above). More recent details have been published that outline the results of further tests into the accuracy and reliability of the methodology.[7]

1.16 In this approach, when the handset detects that an emergency call is being initiated, it uses satellite navigation and other location capabilities (such as Wi-Fi hotspot identification), if available, to ascertain its position. It then sends an emergency SMS ("eSMS") with this information, along with an identifier of the call so that a correlation can be made between the call and the associated location information.

1.17 The emergency service operator will therefore normally receive the emergency call along with the usual network-provided location information (Cell-ID) and, while the call is in progress, updated location information will be made available to the emergency operator.

1.18 A number of key advantages to this approach have been highlighted, many of which we acknowledged in our earlier review of this approach, but now with improved test results:

[6] http://www.ofcom.org.uk/about/what-is-ofcom/statutory-duties-and-regulatory-principles/
[7] "EENA Conference 2014: 112 – improving precision for mobile calls", J. Medland. http://www.eena.org/events/eena-conference-2014-outcomes

- the existing network-based location systems and capabilities are unaltered, hence no emergency call will have less information than currently;

- the software used to implement this solution onto handsets is provided by the originating equipment manufacturer ("oem") directly into the operating system rather than as an Over the Top ("OTT") Application ("App"). This means that the specifications are under the control of the oem rather than third party developers;

- the process of sending an eSMS is already established in UK networks and hence it is not expected that the MNOs or EAs will need to make significant investment to support this approach.

1.19 This development has been a collaborative, industry-led, initiative involving handset manufacturers, mobile network operators and CPs, most notably HTC, EE and BT. We understand that handsets with this functionality are now available on the market and that other handset manufacturers and MNOs may launch similar services shortly.

1.20 Trial results suggest that accuracies of a few tens of metres can be achieved with good reliability, within around 20 seconds of the call initiation (and hence within the timescales normally required to speak with the caller to ascertain the nature of the emergency).

1.21 Ofcom welcomes and supports this initiative and acknowledges the efforts that the industry has made in developing its own approaches to improving emergency caller location information and bringing them to market.

1.22 However, and as highlighted in our Call for Inputs and in the responses received, there may be a number of limitations to handset-based solutions in general. In particular, they will not be able to provide the EAs with the same levels of location information for all calls as not all callers will have the necessary handsets or, if they do, the handsets may not always be able to determine their location for some reason. As a result, a 'gap' is likely to exist between those callers for which this improved functionality is available and those callers for which it does not.

1.23 At this time, it is difficult to estimate the size or scale of this gap or for how long such a gap is likely to endure. An important factor influencing the widespread realisation of this solution is likely to be the availability and adoption of suitable handsets by consumers.

1.24 A constituent element of this gap could be what is known as Limited Service State ("LSS") callers – callers who are outside the coverage area of their own mobile network, or international visitors using any available mobile network to carry the emergency call. In our Call for Inputs, we asked whether future solutions could offer the same benefits to LSS callers and internationally registered callers as for domestic end-users using their 'home' network. The responses from stakeholders differed on this subject, particularly between MNOs and equipment suppliers and hence we shall continue to examine this specific area going forward.

Next steps

1.25 To help monitor the effectiveness of the approach developed and implemented by industry at this time, we intend to work with MNOs, CHAs and the EAs to monitor, so far as possible, the take up, use and the associated benefits/outcomes that

result. This information will help us ascertain whether any regulatory action may be required in the future.