



Location information for emergency calls from mobile phones

Call for Input

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Section 1

Introduction

- 1.1 Every year over 36 million calls are made to the emergency services, with around two thirds of these calls being made from mobile phones; this share is increasing¹. Communications Providers ('CPs') both connect calls to the Emergency Authorities ('EAs') and provide information regarding the location of the caller.
- 1.2 Callers are usually able to confirm their location verbally to the emergency services. However, for a significant, but material minority of cases (around 330,000 per year)², this is not possible. The caller may not know where they are or may be unable to communicate effectively. The accuracy and reliability of the Emergency Caller Location Information ('ECLI') provided by the CP is important as the inability of the emergency services to locate callers can sometimes lead to delays in reaching callers, potentially leading to serious injuries or even deaths, that could otherwise have been avoided.
- 1.3 Under the European Regulatory Framework, Member States are required to ensure that end users³ are able to call the emergency services using the numbers "112" and "999", and that accurate and reliable caller location is provided to EAs⁴. National regulatory authorities ('NRAs'), such as Ofcom, are required to lay down criteria for the accuracy and reliability of the ECLI provided⁵. It is these criteria which are the focus of this Call for Input.
- 1.4 Article 26 of the Universal Services Directive (the 'USD') has been implemented in the UK through General Condition 4 ('GC4') of the General Conditions of Entitlement⁶. In particular, GC4.3 sets out the current criteria for the accuracy and reliability of ECLI⁷ for fixed and mobile calls. In relation to fixed calls, ECLI must, at least, accurately reflect the fixed location of the end-user's terminal equipment, including the full postal address. In relation to calls made on the mobile network, the ECLI must include at least the cell identification⁸ of the cell from which the call is being made or, in exceptional circumstances, the zone code⁹.
- 1.5 These criteria were laid down in our statement published in May 2011, "*Changes to General Conditions and Universal Service Conditions, Implementing the revised EU Framework*". That document indicated that the detailed set of accuracy and reliability criteria for ECLI would be considered in a further consultation. We now consider

¹ From emergency call handling statistics compiled on behalf of the 999/112 Liaison Committee. See Section 3.

² See Section 3 for more details.

³ An "end-user" is a natural person or legal entity who makes use of electronic communications networks or services but who does not provide them.

⁴ Article 26 of the Universal Services Directive (directive 2002/22/EC of the European Parliament and of the Council, as amended by Directive 2009/136/EC).

⁵ Detailed further in Section 2 of this document.

⁶ <http://stakeholders.ofcom.org.uk/telecoms/ga-scheme/general-conditions/>

⁷ 'Caller location information' is defined in GC4.4(a) as "any data or information processed in an electronic communications network indicating the geographic position of the terminal equipment of a person initiating a call."

⁸ 'Cell identification' (or 'Cell-ID') means the geographic coordinates of the cell which is hosting the call and, where available, an indication of the radius of coverage of the cell.

⁹ "Zone code" as specified in GC4.4 (g). It means a code which identifies the geographic region in which the call was originated.

whether or not it would still appropriate for us to proceed in this way and, if so, what the scope of any such consultation should be.

- 1.6 In its recent review of the implementation of the “112” number, the European Commission’s Communications Committee (COCOM 13-04 REV1¹⁰) noted that, although it believed that technical solutions may allow for much better accuracy, Member States had not imposed stricter caller location criteria for mobile calls other than cell identification¹¹.
- 1.7 In this context, and in light of the volume of emergency calls made in the UK each year from mobile phones, Ofcom now considers that it would be helpful to obtain stakeholder input on the current state of play of ECLI for mobile calls. This would help us in assessing whether any further work might be required on the accuracy and reliability criteria set under GC 4.3. We therefore wish to obtain answers to the following questions:
- 1.7.1 What (if any) concerns currently exist with respect to the a) accuracy; and b) reliability of ECLI for mobile calls?
 - 1.7.2 Are there any technologies which might potentially address those concerns?
 - 1.7.3 How might the Ofcom revise criteria set down in GC4.3 in order to take account of any new technologies?
- 1.8 To aid our understanding in this area, we commissioned a research into the technologies and approaches that could assist in improving ECLI for mobile calls¹². In its report, Mott MacDonald (“Mott report”) has highlighted capabilities that might either now, or could in the future, be implemented by Mobile Network Operators (‘MNOs’) for these purposes. We set out some key findings of the Mott report in Sections 3 and 4 of this Call for Input. These two sections further set out our reasons for focusing this Call for Input on mobile call ECLI and the possible approach that might be followed if responses provided by stakeholders suggest that the criteria set in GC 4.3 for mobile ECLI should be more closely examined.
- 1.9 The purpose of this Call for Input is to seek the views and experience of stakeholders in relation to the matters set out above. This is to help inform Ofcom’s policy view as to whether or not further regulatory steps should be taken at this stage. We welcome feedback from all stakeholders but would be particularly interested in the views of those with an interest in the emergency calling system. This includes CPs to whom GC 4 applies¹³ (particularly MNOs), the Call Handling Agents (‘CHAs’)¹⁴, as well as the EAs and consumers. Non-confidential responses will be published on our website.

¹⁰ “Implementation of the European emergency number 112 – Results of the sixth data-gathering round”, March 2013.

http://ec.europa.eu/information_society/newsroom/cf/dae/document.cfm?doc_id=1674

¹¹ In an effort to speed up emergency response times for traffic accidents across Europe, the European Commission also recently announced proposals to create a new “eCall” system that would facilitate the communication of a vehicle’s location to emergency services:

http://ec.europa.eu/commission_2010-2014/kallas/headlines/news/2013/06/ecall_en.htm

¹² “Assessment of Mobile Location Technology – Update”, Mott MacDonald, July 2012. (<http://stakeholders.ofcom.org.uk/binaries/consultations/emergency-mobiles-cfi/annexes/mobile-location-technology.pdf>)

¹³ That is, Communications Providers who provide electronic communications services to end-users.

¹⁴ A ‘Call Handling Agent’ effectively acts as a ‘call centre’, providing a point of interconnection for calls that are being made over a CP’s network to the emergency organisations. The CHA operated by BT handles the majority of emergency traffic.

Section 2

The current legislative and regulatory framework

Introduction

- 2.1 This Section summarises the existing legislative and regulatory framework with regard to the areas which are being considered in this Call for Input.

The European regulatory framework

- 2.2 The provision of electronic communications networks and services in the UK is governed by the European regulatory framework. This framework is comprised of a number of separate Directives¹⁵. Requirements as to emergency calling in Member States are governed principally by Article 26 of the Universal Service Directive¹⁶ (the “USD”).
- 2.3 Articles 26(1) and (2) of the USD require Member States to ensure that CPs who are providing end-users with electronic communications services for the purposes of making national telephone calls¹⁷, enable those end-users to call the emergency services free of charge by using the single European emergency call number “112”, and any national emergency call number specified by Member States (which, in the UK, is “999”).
- 2.4 Further, under Article 26(5) of the USD, Member States are required to ensure that CPs make ECLI available free of charge to the EAs as soon as the call reaches the authority. This applies to calls made on both emergency call numbers “112” and “999”. NRAs must also set down criteria for the accuracy and reliability of the ECLI provided. It is this aspect of Article 26 which is of particular relevance to this Call for Input.
- 2.5 Article 26 of the USD has been implemented in the UK through GC 4. In particular, GCs 4.1 - 4.3 state that:

“4.1 The Communications Provider shall ensure that any End-User can access Emergency Organisations by using the emergency call numbers “112” and “999” at no charge and, in the case of a Pay Telephone, without having to use coins or cards.

4.2 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 no charge to the Emergency Organisations handling those calls, at the time the call is answered by those organisations.

¹⁵ In particular, the Framework Directive (2002/21/EC); the Authorisation Directive (2002/20/EC); the Access Directive (2002/19/EC); the Universal Service Directive (2002/22/EC); and the Directive on privacy and electronic communications (2002/58/EC).

¹⁶ Directive 2002/22/EC of the European Parliament and of the Council on universal service and users’ rights relating to electronic communications networks and services (Universal Service Directive) as amended by Directive 2009/136/EC.

¹⁷ Including the end-users of public pay telephones.

4.3 Where a Communications Provider provides an Electronic Communications Service:

- (a) *at a fixed location, the Caller Location Information must, at least, accurately reflect the fixed location of the End-User's terminal equipment including the full postal address; and*
- (b) *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."*

2.6 A "Communications Provider" is defined in GC 4.4(d), 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."

Ofcom's duties and the General Conditions

2.7 Under section 3(1) of the Communications Act 2003, Ofcom has general duties to (a) further the interests of citizens in relation to communications matters; and (b) further the interests of consumers in relevant markets, where appropriate by promoting competition. We also have duties under section 4 of the Communications Act 2003 to act in accordance with the requirements of European law.

2.8 In performing our general duties under section 3(1) of the Communications Act 2003, Ofcom must have regard to a range of factors including (but not limited to), the desirability of promoting and facilitating the development and use of effective forms of self-regulation; the desirability of encouraging investment and innovation in relevant markets; and the vulnerability of children and of others whose circumstances appear to Ofcom to put them in need of special protection¹⁸.

2.9 Ofcom must also have regard to the principles under which regulatory activities should be transparent, accountable, proportionate, consistent, and targeted only at cases in which action is needed. Ofcom must also have regard to any other principles which appear to us to represent the best regulatory practice. The following of Ofcom's own general regulatory principles¹⁹ are particularly relevant in this regard:

- ensuring that our interventions are evidence-based, proportionate, consistent, accountable and transparent in both deliberation and outcome;
- seeking the least intrusive regulatory mechanisms to achieve our policy objectives;
- consulting widely with all relevant stakeholders and assessing the impact of regulatory action before imposing regulation upon a market.

2.10 Under section 4 of the Communications Act 2003, Ofcom must, in carrying out its statutory functions, act in accordance with the requirements of Community law. Of particular relevance to this Call for Input are the requirements to: promote competition in relation to the provision of electronic communications networks and services; to secure that Ofcom's activities contribute to the development of the European internal market; to promote the interests of all people who are citizens of

¹⁸ Sections 3(4)(c)-(d) and (h) of the Communications Act 2003.

¹⁹ <http://www.ofcom.org.uk/about/what-is-ofcom/statutory-duties-and-regulatory-principles/>

the European Union; to take account of the desirability in not favouring one form of electronic communications network or service over another; and to promote or specifications that are, from time to time, drawn up or adopted by the European Commission and relevant standards-setting bodies²⁰.

- 2.11 Ofcom has powers under sections 45 – 49C of the Communications Act 2003 to set and modify General Conditions as to how electronic communications networks and services may be provided in the UK. Ofcom must, in determining whether or not to exercise these powers, have regard to the principles set out above. If we were minded to propose changes to GC4, we would also need to be satisfied that doing so was objectively justifiable, not unduly discriminatory and, in relation to the aim we intend to achieve, both proportionate and transparent²¹.
- 2.12 The next Section sets out a number of areas where stakeholder input would be useful in helping inform Ofcom's views.

²⁰ As set out in Article 17 of the Framework Directive.

²¹ Section 47 of the Communications Act 2003.

Section 3

Potential reliability and accuracy issues for the provision of mobile ECLI

Introduction

- 3.1 In this Section, we explain the distinction between fixed and mobile ECLI and why the scope of this consultation is limited to mobile ECLI as opposed to fixed-line ECLI and VoIP. We further discuss the potential issues that we understand may arise with respect to the accuracy and reliability of locating calls made from mobile phones.
- 3.2 The 999 emergency calling service was established in 1937 and remains of crucial importance in protecting the safety of the UK public today. Although much of the underlying technology has evolved considerably since its inception, its basic functionality remains essentially unchanged: a caller dials a single emergency number ('999' or '112') which is answered by the CHA. In addition to speaking with the caller, the CHA has access to CP provided information regarding the line identifier of the caller. This information is then used to search a database in a 'location server' in order to ascertain and/or confirm the location of the caller. From the information received, the CHA is then able to forward the call to the nearest appropriate EA.
- 3.3 As noted in Section 1, Ofcom is obliged to lay down criteria as to the accuracy and reliability of ECLI that is provided with emergency calls. As set out above, different criteria apply depending on the way in which the service is being provided, for example over a fixed-line or mobile network.

Fixed ECLI

- 3.4 In relation to fixed-line calls, CPs are required, at a minimum, to accurately reflect the fixed location of the end-user's terminal equipment, including his or her full postal address²². To meet this requirement, CPs maintain a database that associates the calling line identifier with the address to which the line is connected. This means that the information presented on the screens of CHA operators should reflect the premises from which the call is being made.
- 3.5 The accuracy of the location information should therefore accurate to a few tens of metres depending on the size of the property and the range of any cordless (e.g. DECT²³) phone base-station (e.g. for callers using their cordless phone a short distance from their premises). Such accuracy allows fewer questions of the caller regarding their location and results in minimal searches by the emergency services. Furthermore, the reliability of this information is also high as CPs keep the relevant fixed line location databases accurate, and there is a managed process for identifying and addressing any discrepancies²⁴ should they arise. Consequently, callers from fixed-line phones are likely to have assistance dispatched promptly.

²² GC4.3(a)

²³ "DECT" means Digital Enhanced Cordless Communications.

²⁴ Typically arising as a result of house or service moves where an emergency call is made in the time between when the service is re-assigned and the relevant database is updated.

Mobile ECLI

- 3.6 It is important to note that given the significant differences between fixed line and mobile technologies, the accuracy and reliability of fixed calls cannot necessarily be used as a target for mobile calls. It does, however, highlight the benefits to citizens of prompt, accurate and reliable location information made available to the emergency services.
- 3.7 As set out above, for mobile calls, a CP is required to provide at least the cell identification of the cell from which the call is being made or, in exceptional cases, the zone code²⁵. In a similar manner to fixed calls, an identifier is associated with the call that is unique to the particular mobile cell site that supports the call. When the call is received by the CHA, this identifier is used to search a location server database, populated and managed by the MNO, to determine the location of the cell site as well as an estimate of the cell's coverage. This information is used to both forward the call to the appropriate EA as well as to help locate the caller.

Potential issues for mobile ECLI

- 3.8 As cells are deployed by MNOs to meet both capacity as well as coverage demands, cells are not evenly distributed across the UK, being located closer together in urban areas than in rural. Therefore although a typical cell may cover an area of around 15 square km, this could vary significantly from region to region (between 500m and 20km²⁶). Arguably, in areas where accuracy would be most beneficial (e.g. where obvious landmarks are fewer), cell coverage is greater and hence caller location accuracy is poorer.
- 3.9 In some cases, for example in the event that a failure has occurred in accessing the database in the location server, it is still possible for the zone code representing a cluster of masts in an area to be provided. While this information may help identify the correct EA to which to forward the call, the location of the user will be far less accurate compared to that provided by a particular cell location and coverage. This makes verbal confirmation of location by the caller particularly important.
- 3.10 In general, the current reliability and accuracy of mobile caller location information automatically provided by the CPs, is such that EA operators need to ask a number of questions of callers in order to establish or confirm their location with sufficient accuracy to ensure that assistance can be dispatched accordingly. Last year, BT (in its capacity as a CHA) presented²⁷ research it had undertaken in relation to the provision of ECLI for mobile calls. We understand from that research that it can take EA control rooms longer to establish a location for end-users making calls over the mobile network than is the case for those making calls over the fixed-line network. In particular, we understand that:
- Emergency calls from mobile phones may, on average, take 30 seconds longer to complete²⁸ than those from fixed-line phones. This may be because of the additional time taken to establish the location of the caller through questioning. Such delays can have implications for the speed at which the emergency services can be dispatched;

²⁵ GC4.3(b).

²⁶ See Table 2-6, Mott report, footnote 12.

²⁷ <http://www.nicstandards.org.uk/meetings/2012johnmedland.pdf?type=pdf>

²⁸ i.e. when the EA operator concludes the call.

- If the caller is in distress and/or injured, calls from mobiles can take up to 3 minutes longer to complete than for fixed line calls, again, thus suggesting that difficulties in obtaining sufficient location information from the caller can potentially result in delays;
- Around 330,000 calls are made each year to the emergency services in which a response may be needed, yet the caller is unable to speak. For callers from mobile phones this may present significant issues in dispatching prompt and appropriate assistance to the correct location; and
- There are around 36,500 critical incidents per year in which a 'long search' is required – which can take up to 30 minutes or more to complete. Although various causes and different factors will come into play in such incidents, some of these 'long search' may be explained by the time that it takes to confirm the location of callers calling from mobile phones.

Scope of this Call for Input

3.11 As set out above, over 36 million calls are now made to the emergency services every year (i.e. around one a second), of which approximately two thirds are made from mobile phones. This is compared to just under one third of emergency calls being made from conventional fixed-line phones, with the remainder (less than 1%) being made from Voice over Internet Protocol ('VoIP') phones. We are also aware that the share of mobile emergency calls is increasing²⁹. We believe that it is therefore particularly important for Ofcom to obtain input from stakeholders on the accuracy and reliability of mobile call ECLI. We are therefore not proposing to consider fixed line ECLI and calls made over VOIP as part of this Call for Input. We may however decide to do so at a later stage in light of further developments in these areas³⁰.

Question 1:

1.1 Is Ofcom correct in focusing its attention on ECLI for mobile emergency calls (as opposed, for example, to fixed-line or VoIP calls) at this time?

²⁹ This is based on emergency call handling statistics compiled on behalf of the 999/112 Liaison Committee. The 999/112 Liaison Committee is attended by representatives from the emergency services, CPs, CHAs, Ofcom and relevant government departments to discuss, and where appropriate, agree the practices and processes associated with emergency call handling.

³⁰ Calls made using VoIP protocols are routed through IP networks, potentially including the public Internet and as a result the information associated with the call, such as the calling line identifier, cannot, in general, be used to determine the location of the caller. As a result a 'VoIP flag' is used to notify the CHA operator that the caller's location cannot be reliably established and therefore verbal confirmation of location is required. This is set out in more detail in our May 2011 statement. "Changes to General Conditions and Universal Service Conditions, Implementing the revised EU Framework", May 2011, <http://stakeholders.ofcom.org.uk/binaries/consultations/gc-usc/statement/Statement.pdf> and associated reference to our December 2007 Statement: <http://stakeholders.ofcom.org.uk/binaries/consultations/voip/statement/voipstatement.pdf>. The solutions for providing accurate and reliable ECLI for VoIP calls are still under examination by industry and relevant standards bodies (see for example, NICC ND 1638 Issue 1.1.2: <http://www.niccstandards.org.uk/files/current/ND1638%20V1.1.2.pdf> and IETF ECRIT: <http://datatracker.ietf.org/wg/ecrit/charter/>)

1.2 Are there, in your view, any concerns associated with the current provision of mobile ECLI in terms of a) accuracy and b) reliability? If so, what are these concerns?

Section 4

Possible new technologies

Introduction

4.1 As set out in Section 3, stakeholders are invited to highlight any problems that may be associated with the current provision of mobile ECLI in terms of accuracy and reliability. Depending on responses received from stakeholders, Ofcom may need to consider a review of the criteria set out in GC4.3(b). This Section below explores technologies that may be relevant in that context as described in the Mott report.

New technological approaches to the provision of mobile ECLI

4.2 The Mott report³¹ identified a range of different approaches that might be adopted in making mobile ECLI available to the emergency services. These include:

- ‘Network-based’ approaches whereby functionality in the CP’s network, potentially in conjunction with capabilities inherent in the handset, derive the location of the caller; and
- ‘Handset-based’ approaches whereby software or applications (‘Apps’) establish the location of the handset essentially independently of the network, and therefore potentially outside the control of the CP, and relay this information to the emergency services.

Network-based approaches

4.3 Network-based techniques take advantage of capabilities and features within the network to ascertain the caller’s location and to relay this information to the CHA. The current approach of deriving Cell-ID can be considered a network based technique. These solutions can be subdivided into those that offer improved location information only to compatible handsets (phones that have additional capabilities to coordinate with network-based techniques) and those that offer improvements to all handsets. In either case, it is the network that manages the process of deriving the location and hence solutions may ultimately be more robust (in that they are under the control of the CP) and sustainable (in that they could be expected to be supported in the long-term).

4.4 The Mott report details a number of mechanisms and techniques that mobile networks could adopt to support enhanced ECLI for users with compatible handsets³². These handsets may not necessarily be smartphones, but would need to have appropriate functionality to support these approaches. The core mobile networks themselves may need to be upgraded in order to perform the necessary functions.

4.5 Depending on the techniques adopted, the levels of accuracy and reliability may be greater than the ones achieved with Cell ID but less than, for example, those

³¹ See footnote 12

³² See Section 3 of the Mott report.

obtained through handset-derived GNSS³³ location information, potentially around 100-300m accuracy³⁴.

- 4.6 The Mott report indicates that the deployment of LTE³⁵ technologies and services may present an opportunity for network-based approaches to be implemented for LTE-enabled devices. The report however provides that the extent and rate of LTE implementation will vary from one operator to another.
- 4.7 Additional network functionality could be provided in order to offer improved location accuracy and reliability for all callers, irrespective of the handset used (one such example was discussed in the Mott report³⁶). While handsets would not necessarily need to have special capabilities, specialist network equipment to undertake this function and possibly co-ordinate activities and transmissions with other cell sites in the area may need to be deployed at cell sites. The levels of accuracy and reliability for legacy handsets (i.e. those without upgraded functionality) could be around 100-300 metres, with potentially better performance for handsets with upgraded location capabilities.
- 4.8 However, the development and deployment of such capability across the entire network would require network development that may prove to be significant, even with the deployment of LTE networks. This will need to be balanced with a careful assessment of the benefits that this solution could bring. Furthermore, were smartphone take-up and adoption to continue to increase in the UK, along with improved GNSS functionality embedded in them, the additional benefits of a dedicated network-based approach could diminish.
- 4.9 Network-based approaches to establish location information could be independent of the caller's location and choice of mobile phone and therefore may result in more trusted location information being available, as the CP has control over the mechanisms by which location information is established and forwarded to the EAs. Such solutions could also, over time, address all end users irrespective of their choice of handset.

Question 2:

Do you agree that network-based approaches could offer solution to tackle the potential issues regarding reliability and accuracy of mobile ECLI?

Question 3:

To what extent would the provision of such solutions be reliant on the deployment of LTE networks and what would be the likely timescales for implementing such solutions?

Question 4:

Could these solutions offer the same benefits to Limited Service State ('LSS')³⁷ callers and internationally registered callers as for domestic end-users using their 'home' network?

³³ GNSS means Global Navigation Satellite Systems, the generic term for satellite navigation systems such as the US Global Positioning System ('GPS').

³⁴ See, for example, tables 3.3 and 3.4 of the Mott MacDonald report (footnote 12).

³⁵ 'LTE' means Long Term Evolution, the technology standard of 4G mobile networks.

³⁶ Section 2.6 of the Mott report.

³⁷ LSS callers or roamers are UK callers making emergency call using a network other than to which they subscribe.

Handset-based approaches

- 4.10 Ofcom recognises from the outset that, in relation to handset-based approaches, our regulatory remit extends only to the matters set out under the European regulatory framework (see Section 2). We do not regulate the provision of software for terminal equipment, such as handset Apps, and it is not our intention to seek to do so through GC4.3. Rather, the purpose of this section is to gain a better understanding of developing industry practice, irrespective of regulation.
- 4.11 We are aware of Apps and services that are able to ascertain the caller's location and convey this information to a third party (including, potentially, the emergency services). In particular, a number of road vehicle systems exist that directly or indirectly (via an operations centre) contact the emergency services with vehicle's current location in the event of an accident³⁸. The anticipated 'e-call' system for vehicles could also be considered to be an App-based system³⁹.
- 4.12 In the Mott report, a trial of a specific smartphone App developed and implemented by BT was reported⁴⁰. When an emergency call number was dialled, this App identified that an emergency call was being made and forwarded the location derived from the handset, from satellite positioning, Wi-Fi database look-up or both, via an eSMS⁴¹ server, to the location server used by the emergency authorities to establish the location of a caller. The trial found that for 65% of cases examined, the location provided by the App was more accurate than the location that would have been given using existing technology (i.e. cell identification or zone code) than currently available (the difference between actual and predicted location was measured to be around 10-30 metres depending on environment as opposed to 500-2000 metres for the corresponding cell coverage methods). Although this trial was limited in size and scope, it suggests that App-based approaches could potentially be used more widely to enhance the current accuracy and reliability of mobile ECLI.
- 4.13 In the event that enhanced location information is not available (for example if the App malfunctions or it is unable to establish its location for any reason), it appears from the BT trial that the current level of accuracy (i.e. the provision of the Cell-ID) can normally still be achieved. In the event that enhanced location information is provided, it can be compared with the existing network-derived cell identification information to provide the emergency services more confidence that the information provided is reliable. Furthermore, by complementing GNSS capability with Wi-Fi location databases, coverage, particularly in urban environments, could be further improved with the same App.
- 4.14 However, in addition to the potential benefits set out above, Apps may also have a number of drawbacks:
- In some instances, Apps may not be able to provide relevant information in a timely manner or at all. In buildings, urban canyons, underground/tube networks, handsets (including the App) may struggle to quickly ascertain the location of the

³⁸ Current examples include:

<http://www.bmw.co.uk/en/topics/discover-bmw/connecteddrive/safety/advanced-emergency-call.html>
<http://www.citroen.co.uk/new-cars/car-range/citroen-c4/safety/#/new-cars/car-range/citroen-c4/safety/etouch-system>

<https://itunes.apple.com/gb/app/realrider/id570371289?mt=8>

³⁹ http://europa.eu/rapid/press-release_SPEECH-13-533_en.htm?locale=en

⁴⁰ The Mott MacDonald report (footnote12), Section 7.3.2.1.

⁴¹ eSMS (Emergency Short Message Service) is a UK SMS service that allows contact to the emergency services from pre-registered users.

caller. Furthermore, the continuous operation of GNSS on the phone may present a drain on battery life, which could result in the device not working when needed. Turning the GNSS facility on when required could result in delays while an accurate location fix is obtained.

- The Mott report suggests that it is unlikely that an approach similar to the BT trial would work for either LSS roamers (i.e. UK Callers making an emergency call using a network other than to which they subscribe) due to the lack of calling line identifier information to perform the lookup in the relevant location server databases, or for full roamers (non-UK residents calling from within the UK) due to constraints in the SMS delivery mechanisms.

4.15 Based on the information available to us, we believe that handset-based approaches for the provision of improved location information could be achievable using currently available technology. As set out above, we however recognise that, in relation to handset-based approaches, our regulatory remit extends only to the matters set out under the European regulatory framework (see Section 2). We do not regulate the provision of software for terminal equipment. We further recognise some of the limitations and challenges that could be associated with their introduction. We nonetheless would like to gather wider evidence and views from stakeholders as to the benefits and issues that could result from such technologies, particularly on a long-term basis. This information could help to inform our consideration as to whether any potential reliability and accuracy concerns in relation to mobile ECLI might be satisfactorily addressed in practice, without further regulation.

Question 5:

5.1 Do you think that handset based approaches (e.g. Apps) could offer a cost-effective and dependable means to tackle potential problems linked to accuracy and/or reliability in mobile location information? If so, what are the likely costs to all parties involved in the end to end support of handset-based approaches?

5.2 Do you see solutions such as Apps as a long-term alternative to network-based approaches?

Section 5

Revising criteria to take account of technology

Introduction

- 5.1 In the previous Section, we discussed the potential technologies that may be available for the purposes of tackling potential issues regarding the accuracy and reliability of mobile ECLI. We now consider how these might be reflected in any revision to the criteria set down in GC4.3(b). This is taking into account developments that may be taking place internationally, both within other Member States and beyond, as well as the potential implications that new criteria may have for EAs and consumers. It is important that both the accuracy *and* reliability of mobile ECLI are being considered when referring to the criteria set under GC 4(3).

Developments and standardisation on an international basis

- 5.2 The European Commission (EC) regularly reviews how Member States are implementing Article 26 of the amended Universal Service Directive. As set out above, in its recent review the Communications Committee (COCOM 13-04 REV1⁴²) reported that: *“As regards requirements on caller location there is no improvement. The wide majority of Member States reported ... Cell ID for mobile caller location. No Member State imposed stricter caller location criteria for mobile calls than Cell/Sector ID, although the available technical solution allow today for a much better accuracy.”* This highlights the importance of this area attached by the EC. One of the key purposes of this Call for Input is therefore to establish whether new technical solutions might be available.
- 5.3 We are also aware that many MNOs are multi-national organisations and that the technologies and systems adopted can, in many cases, be common throughout the world. Therefore, we are keen to understand how technology deployments, either in progress or being planned could influence the costs and benefits of the approaches discussed here. We are particularly mindful of the advantages that could result from common or consistent approaches in ECLI adopted across the European Union.
- 5.4 While consistent and potentially standardised approaches across Europe and potentially the world can result in lower costs due to the higher volumes anticipated we are also aware that international agreement, specification and subsequent implementation can take some time. In this regard, we would like to understand how other states, both within the European Union and around the world, are addressing the issues under discussion as well as anticipated timescales for technology introduction and where critical bottlenecks exist that could affect them.

Use of ECLI by Emergency Authorities

- 5.5 In establishing the most appropriate approaches in tackling potential issues with respect to the accuracy and reliability of mobile ECLI, the reception, interpretation

⁴² “Implementation of the European emergency number 112 – Results of the sixth data-gathering round”, March 2013.

http://ec.europa.eu/information_society/newsroom/cf/dae/document.cfm?doc_id=1674

and use of ECLI information by the EAs would be of considerable importance. If the information to be provided were not materially better than currently provided, then little or no benefit may be realised, either in terms of time/cost savings or consumer/citizen welfare (safety of life). Conversely, if the information to be provided were more accurate than the EAs are currently able to take advantage of, this could represent wasted investment.

- 5.6 We understand that the extent to which ECLI is used by the EAs is mixed across the UK, although it is being increasingly seen as an important element to improve services and reduce assistance times⁴³. In the current economic climate, EAs are examining ways to co-ordinate or even merge certain elements of their activities and this could include operational control centres. While the introduction of command and control systems that can take advantage of accurate location information can lead to operational efficiencies (for example in identifying most appropriate resource to deploy) their implementation also represents a cost to the EAs.
- 5.7 We are therefore interested to learn from EAs whether, and to what extent, location information above and beyond cell identification, could lead to tangible benefits to the services themselves and help in tackling potential issues with respect to the accuracy and/or reliability of mobile ECLI. In addition, we would also be interested to understand whether the accuracy necessary to lead to improvements would be different in different geographic areas and in response to different types of emergencies.

Question 6:

What are the changes that EAs would suggest in order to address potential issues regarding accuracy and reliability of mobile ECLI?

Question 7:

What would be the potential costs implications for EAs if such changes were to be implemented?

Implications for consumers

- 5.8 The potential approaches for tackling potential issues regarding location information for mobile calls could have different implications for consumers, over and above the benefits in receiving prompt emergency assistance. Such implications include for example, handset-based approaches that may require handsets to log, store and share accurate location information of the consumer, which could include last known locations⁴⁴ and speed and direction of travel. Should citizens disable or interfere with such mechanisms (e.g. by disabling or interfering with the GNSS capability in a handset) due to concerns over personal information sharing, then the benefits associated with such solutions may diminish.
- 5.9 In addition, some solutions, such as mobile Apps, may depend on regular updates and patches being installed by the consumer to ensure that they will operate correctly when they are needed. We would like to understand how this could be (or is currently) managed, so that such updates are accepted and installed correctly. The implications for, and reaction of, consumers with respect to these approaches is a key element in developing our overall policy.

⁴³ Section 7 of the Mott report.

⁴⁴ For example, the handset may record the last confirmed position(s) of the user to be used in the event that (re)-establishing GNSS position when needed is not possible or takes too long.

Question 8: Are there ways in which tackling potential issues regarding the accuracy and/or reliability of mobile call ECLI could adversely affect consumers, and could these be mitigated?

Looking forward – new technologies and accuracy and reliability criteria

- 5.10 As explained in the previous Sections of this document, Ofcom is seeking responses from stakeholders as to whether or not there are material problems in the current provision of mobile ECLI. As set out in Section 2, Ofcom's activities must be proportionate and targeted at cases where action is needed. In circumstances where we do identify such problems, we may then need to consider whether or not there are technologies that could address these and, if so, how such technologies could be translated into criteria for the purposes of GC4.3. At present, to ensure accuracy and reliability of location information for mobile calls, the information attached to the call must at least include the cell identification of the cell from which the call is being made, or in exceptional circumstances the zone code (GC 4.3(b)). If the implementation of new technological solutions were to be envisaged, the references to cell identification and zone code may need to be revised as these may not be relevant criteria in light of the new technologies put in place.
- 5.11 Although we are still at a formative stage of our thinking, it would be useful to understand stakeholders' views regarding the criteria that they think might be put in place in light of possible new technologies. These new criteria might be expressed either in terms of specific approaches that should be used (as it is currently the case by reference to cell identification and zone code) or, alternatively, by reference to a set of metrics or outcomes where CPs are left to determine how to implement the new technologies to achieve in order to meet these objectives. There may be different cost and benefit implications associated with each approach.
- 5.12 By way of example, the approach taken in the United States is that the FCC⁴⁵ has stipulated that wireless carriers that deploy handset-based location accuracy technologies must meet the initial Enhanced 911 (E911) benchmark for location accuracy standards at either a county-based or Public Safety Answering Point (PSAP)-based geographic level, by January 2018⁴⁶. Specifically, relevant CPs "*must meet the following standard on location accuracy for 911 calls: 50 meters for 67 percent of calls, and 150 meters for 80 percent of calls, on a per-county or per-PSAP basis*"⁴⁷. While this approach sets out the specific outcomes that are expected of CPs, it does not indicate the specific technologies or approaches necessary to achieve them.
- 5.13 Setting out accuracy and reliability criteria for mobile location information without stipulating a particular approach or technology has the benefit of being 'technology neutral', allowing for various methods and techniques to evolve over time. However, it may be difficult to assess compliance by establishing whether or not a CP is actually achieving the relevant outcome, or is doing so consistently. We are therefore keen to understand stakeholder perspectives on the burdens, benefits and risks that may be associated with technology neutral compliance criteria.

⁴⁵ Federal Communications Commission.

⁴⁶ FCC PS Docket No. 07-114, January 2013.

⁴⁷ It should be noted that certain exemptions and exclusions apply, for example in heavily forested areas.

Question 9:

If Ofcom was to consider setting further criteria for the accuracy and reliability of ECLI, should these be independent of the technology used by a CP?

Section 6

Next steps

- 6.1 The feedback we receive to this Call for Input should help us assess whether or not there are any issues in relation to the accuracy and reliability of ECLI for mobile calls. Depending on the responses received, we may have to consider whether the criteria set down for the provision of ECLI for mobile calls are currently appropriate, or whether we need to consider revising GC4.3 to update this. We have not yet taken a view as to whether or not such a revision is necessary. This decision is likely to depend on the responses we receive from stakeholders. It may be that Ofcom publishes a further consultation setting out specific proposals in due course.

Annex 1

Responding to this Consultation

How to respond

- A1.1 Ofcom invites written views and comments on the issues raised in this document, to be made **by 5pm on 23 December 2013**.
- A1.2 Ofcom strongly prefers to receive responses using the online web form at <http://stakeholders.ofcom.org.uk/consultations/emergency-mobiles-cfi/howtorespond/form>, as this helps us to process the responses quickly and efficiently. We would also be grateful if you could assist us by completing a response cover sheet (see Annex 3), to indicate whether or not there are confidentiality issues. This response coversheet is incorporated into the online web form questionnaire.
- A1.3 For larger consultation responses - particularly those with supporting charts, tables or other data - please email Mobile_Location_CFI@ofcom.org.uk attaching your response in Microsoft Word format, together with a consultation response coversheet.
- A1.4 Responses may alternatively be posted or faxed to the address below, marked with the title of the consultation.
- Tim Gilfedder
Floor 3,
Strategy, International, Technology and Economics Group,
Riverside House
2A Southwark Bridge Road
London SE1 9HA
- Fax: 020 7981 3333
- A1.5 Note that we do not need a hard copy in addition to an electronic version. Ofcom will acknowledge receipt of responses if they are submitted using the online web form but not otherwise.
- A1.6 It would be helpful if your response could include direct answers to the questions asked in this document, which are listed together at Annex 4. It would also help if you can explain why you hold your views and how Ofcom's proposals would impact on you.

Further information

- A1.7 If you want to discuss the issues and questions raised in this Consultation, or need advice on the appropriate form of response, please contact Tim Gilfedder on 020 7981 3550.

Confidentiality

- A1.8 We believe it is important for everyone interested in an issue to see the views expressed by consultation respondents. We will therefore usually publish all

responses on our website, www.ofcom.org.uk, ideally on receipt. If you think your response should be kept confidential, can you please specify what part or whether all of your response should be kept confidential, and specify why. Please also place such parts in a separate annex.

- A1.9 If someone asks us to keep part or all of a response confidential, we will treat this request seriously and will try to respect this. But sometimes we will need to publish all responses, including those that are marked as confidential, in order to meet legal obligations.
- A1.10 Please also note that copyright and all other intellectual property in responses will be assumed to be licensed to Ofcom to use. Ofcom's approach on intellectual property rights is explained further on its website at <http://www.ofcom.org.uk/about/accoun/disclaimer/>

Next steps

- A1.11 Following the end of the consultation period, Ofcom will consider what further steps may be necessary. Any specific proposals will be the subject of a formal consultation exercise.
- A1.12 Please note that you can register to receive free mail Updates alerting you to the publications of relevant Ofcom documents. For more details please see: http://www.ofcom.org.uk/static/subscribe/select_list.htm

Ofcom's consultation processes

- A1.13 Ofcom seeks to ensure that responding to a consultation is easy as possible. For more information please see our consultation principles in Annex 2.
- A1.14 If you have any comments or suggestions on how Ofcom conducts its consultations, please call our consultation helpdesk on 020 7981 3003 or e-mail us at consult@ofcom.org.uk . We would particularly welcome thoughts on how Ofcom could more effectively seek the views of those groups or individuals, such as small businesses or particular types of residential consumers, who are less likely to give their opinions through a formal consultation.
- A1.15 If you would like to discuss these issues or Ofcom's consultation processes more generally you can alternatively contact Graham Howell, Secretary to the Corporation, who is Ofcom's consultation champion:

Graham Howell
Ofcom
Riverside House
2a Southwark Bridge Road
London SE1 9HA

Tel: 020 7981 3601

Email Graham.Howell@ofcom.org.uk

Annex 2

Ofcom's consultation principles

A2.1 Ofcom has published the following seven principles that it will follow for each public written consultation:

Before the consultation

A2.2 Where possible, we will hold informal talks with people and organisations before announcing a big consultation to find out whether we are thinking in the right direction. If we do not have enough time to do this, we will hold an open meeting to explain our proposals shortly after announcing the consultation.

During the consultation

A2.3 We will be clear about who we are consulting, why, on what questions and for how long.

A2.4 We will make the consultation document as short and simple as possible with a summary of no more than two pages. We will try to make it as easy as possible to give us a written response. If the consultation is complicated, we may provide a shortened Plain English Guide for smaller organisations or individuals who would otherwise not be able to spare the time to share their views.

A2.5 We will consult for up to 10 weeks depending on the potential impact of our proposals.

A2.6 A person within Ofcom will be in charge of making sure we follow our own guidelines and reach out to the largest number of people and organisations interested in the outcome of our decisions. Ofcom's 'Consultation Champion' will also be the main person to contact with views on the way we run our consultations.

A2.7 If we are not able to follow one of these principles, we will explain why.

After the consultation

A2.8 We think it is important for everyone interested in an issue to see the views of others during a consultation. We would usually publish all the responses we have received on our website. In our statement, we will give reasons for our decisions and will give an account of how the views of those concerned helped shape those decisions.

Annex 3

Consultation response cover sheet

- A3.1 In the interests of transparency and good regulatory practice, we will publish all consultation responses in full on our website, www.ofcom.org.uk.
- A3.2 We have produced a coversheet for responses (see below) and would be very grateful if you could send one with your response (this is incorporated into the online web form if you respond in this way). This will speed up our processing of responses, and help to maintain confidentiality where appropriate.
- A3.3 The quality of consultation can be enhanced by publishing responses before the consultation period closes. In particular, this can help those individuals and organisations with limited resources or familiarity with the issues to respond in a more informed way. Therefore Ofcom would encourage respondents to complete their coversheet in a way that allows Ofcom to publish their responses upon receipt, rather than waiting until the consultation period has ended.
- A3.4 We strongly prefer to receive responses via the online web form which incorporates the coversheet. If you are responding via email, post or fax you can download an electronic copy of this coversheet in Word or RTF format from the 'Consultations' section of our website at www.ofcom.org.uk/consult/.
- A3.5 Please put any parts of your response you consider should be kept confidential in a separate annex to your response and include your reasons why this part of your response should not be published. This can include information such as your personal background and experience. If you want your name, address, other contact details, or job title to remain confidential, please provide them in your cover sheet only, so that we don't have to edit your response.

Cover sheet for response to an Ofcom consultation

BASIC DETAILS

Consultation title:

To (Ofcom contact):

Name of respondent:

Representing (self or organisation/s):

Address (if not received by email):

CONFIDENTIALITY

Please tick below what part of your response you consider is confidential, giving your reasons why

Nothing	<input type="checkbox"/>	Name/contact details/job title	<input type="checkbox"/>
Whole response	<input type="checkbox"/>	Organisation	<input type="checkbox"/>
Part of the response	<input type="checkbox"/>	If there is no separate annex, which parts?	

If you want part of your response, your name or your organisation not to be published, can Ofcom still publish a reference to the contents of your response (including, for any confidential parts, a general summary that does not disclose the specific information or enable you to be identified)?

DECLARATION

I confirm that the correspondence supplied with this cover sheet is a formal consultation response that Ofcom can publish. However, in supplying this response, I understand that Ofcom may need to publish all responses, including those which are marked as confidential, in order to meet legal obligations. If I have sent my response by email, Ofcom can disregard any standard e-mail text about not disclosing email contents and attachments.

Ofcom seeks to publish responses on receipt. If your response is non-confidential (in whole or in part), and you would prefer us to publish your response only once the consultation has ended, please tick here.

Name

Signed (if hard copy)

Annex 4

Call for Input questions

A4.1 This section presents the specific questions that Ofcom seeks responses to in relation to this issue.

Question 1:

1.1 Is Ofcom correct in focusing its attention on ECLI for mobile emergency calls (as opposed, for example, to fixed-line or VoIP calls) at this time?

1.2 Are there, in your view, any concerns associated with the current provision of mobile ECLI in terms of a) accuracy and b) reliability? If so, what are these concerns?

Question 2:

Do you agree that network-based approaches could offer solution to tackle the potential issues regarding reliability and accuracy of mobile ECLI?

Question 3:

To what extent would the provision of such solutions be reliant on the deployment of LTE networks and what would be the likely timescales for implementing such solutions?

Question 4:

Could these solutions offer the same benefits to Limited Service State ('LSS') callers and internationally registered callers as for domestic end-users using their 'home' network?

Question 5:

5.1 Do you think that handset based approaches (e.g. Apps) could offer a cost-effective and dependable means to tackle potential problems linked to accuracy and/or reliability in mobile location information? If so, what are the likely costs to all parties involved in the end to end support of handset-based approaches?

5.2 Do you see solutions such as Apps as a long-term alternative to network-based approaches?

Question 6:

What are the changes that EAs would suggest in order to address potential issues regarding accuracy and reliability of mobile ECLI?

Question 7:

What would be the potential costs implications for EAs if such changes were to be implemented?

Question 8: Are there ways in which tackling potential issues regarding the accuracy and/or reliability of mobile call ECLI could adversely affect consumers, and could these be mitigated?

Question 9:

If Ofcom was to consider setting further criteria for the accuracy and reliability of ECLI, should these be independent of the technology used by a CP?