Enhanced Caller Location for Emergency Calls

ComReg experience and perspective
• Regulation 93(7)(d) of the Irish code (EECC) regulations and Commission delegated regulation 2023/444 require member states to lay down criteria for accuracy and reliability of caller location information for emergency calls.

• Reliability
  ➢ Percentage of calls to ECAS where caller location meets accuracy criteria

• Accuracy
  ➢ Fixed line requirement: Fixed line address
  ➢ Mobile requirement: Search area expressed in metres

• EENA Recommendation
  ➢ 50m accuracy for 80% of emergency calls
Network Derived Mobile Caller Location: Cell ID

• Cell ID is provided with every mobile call
• Available from call commencement
• PSAP determines a mobile caller’s (very approximate) location by looking up Cell ID against database
• Database periodically updated by mobile operators, providing mobile network topology data
• Accuracy is poor, particularly in rural areas
Device Derived Mobile Caller Location: About

• Smartphones contain capability to ascertain location from GNSS sources (GPS, Galileo)
  ➢ Standard limitations apply – Time to fix location, line of sight to several satellites etc

• Device derived location via GNSS is less accurate than one might expect
  ➢ Supplemented by proprietary solutions using other data sources e.g. WiFi hotspot location.
    ➢ Apple iOS: Hybridized Emergency Location (“HELO”)
    ➢ Google Android: Fused Location Provider (“FLP”)

• When a device provides its location to PSAP, an indication of location source (GNSS Vs WiFi) is included
Device Derived Mobile Caller Location: AML

- Device derived location far superior to network derived location.
- Location expressed as a circle in which the device has confidence it is located.
- Information sent to PSAP in a silent SMS, sent without caller’s knowledge or involvement, several seconds after call commencement.
- Requires a modern smartphone.
- Reliability of AML delivery is a challenge, currently provided for ~60%-65% of mobile calls.
- Saving lives in Ireland since 2017.
• PIDF-LO is the next step beyond AML

• Same data as AML but:
  ➢ Contains enhanced location data including height/altitude
  ➢ Carried in the call setup signalling for 4G VoLTE emergency calls, so no reliability issues anticipated
  ➢ Capable of expressing location in multiple, flexible formats
  ➢ Preferred format for location conveyance on Apple devices

• Expected to come with VoLTE emergency calling
AML Reception Rate combined with number of AMLs indicating a location accuracy of 50 metres or less – **54.4%**

One mobile device platform shows a significant jump between 60m – 70m for WiFi location fixing.

AML-GPS accuracy less than (m)  
AML-WiFi accuracy less than (m)

**95.1% < 50m**

**64.8% < 50m**

Combined 82.7%
### Consultation’s conclusions

<table>
<thead>
<tr>
<th>Fixed Line Operators</th>
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<tbody>
<tr>
<td>• Must update PSAP address database monthly, for each fixed line number with</td>
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<tr>
<td> Eircode</td>
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<tr>
<td> Address Coordinates</td>
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<tr>
<td> Installation address</td>
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<td>• In the order of preference listed</td>
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<table>
<thead>
<tr>
<th>Mobile Operators</th>
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<tr>
<td>• Must continue to send Cell ID with each call, and update PSAP Cell ID database regularly</td>
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<tr>
<td>• For AML and PIDF-LO, must</td>
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<tr>
<td> Ensure their network is capable of carrying</td>
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<td> Take all steps to support device in sending</td>
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<td> Deliver to PSAP when sent by device</td>
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<td>• ... Where technically feasible</td>
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<tr>
<td>• Must ensure a minimum reliability level of <strong>54.5%</strong> of calls to have less than 50m accuracy, with a target of 80% anticipated from the cumulative effect of the measures adopted, changes in handset profiles and ongoing network upgrades</td>
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