eCall – Introduction, deployment and life cycle

Freddie McBride, European Communications Office
• About CEPT, ECC and ECO
• What is eCall?
• eCall Legislative Requirements
• eCall Penetration Projection
• Pan-European eCall V TPS eCall
• eCall Technology
• Numbering for eCall
• Lifecycle Management
About CEPT, ECC and ECO

• Conférence Européenne des Administrations des Postes et des Télécommunications – CEPT
• Established in 1959 by 19 countries, which expanded to 26 during its first ten years
• Original members - public postal and telecommunications incumbents. Today – Ministries and Regulators
• CEPT's activities include co-operation on commercial, operational, regulatory and technical standardisation issues
• Today 48 countries are members of CEPT (EU28+20)
• The ECO is the permanent office of CEPT and is located in Copenhagen
• Not an EU institution!!!!!!
ECC Deliverables relevant to eCall

• ECC/REC/(11)03 - Numbering and Addressing for Machine-to-Machine (M2M) communications
• ECC Report 212 - Evolution in the Use of E 212 Mobile Network Codes
• ECC Report 225 - Establishing Criteria for the Accuracy and Reliability of the Caller Location Information in support of Emergency Services
• ECC/REC/(16)02 - Extra Territorial Use of E 164 Numbers - High level principles of assignment and use
• .............and one from the archives!

LONG TERM STANDARDISATION OF NATIONAL NUMBERING PLANS

Recommendation proposed by the T/WG 7 “Services and Facilities” (SF) Working Group

Text of the revised Recommendation adopted by the “Commercial Action Committee” (CAC):

"The European Conference of Posts and Telecommunications Administrations,

considering
— that the number of people travelling abroad (especially in Europe) is increasing every year,
— that the use of the telephone service is becoming more and more frequent internationally,
— that a standardised code structure is proposed in Recommendation T/SF 2 E on new services and facilities in modern telephone systems,
— that, for people travelling abroad, it seems essential, at present, to achieve, in the first place, standardisation of the following prefixes and codes:
  a) international prefix
  b) trunk prefix
  c) emergency services number
  d) international operator’s number
  c) information service for national directory enquiries,
— that such standardisation can only be achieved in the long term,
— that standardisation of these prefixes and numbers could affect the national numbering plans of different countries,

recommends
— that when Network Operators revise their national numbering plans, they should seek to introduce
  a) as an international prefix 00
  b) as a trunk prefix 0
  and that, although a common plan will always exist for national numbering plans,
  c) as the number for the emergency service 112
  d) as the number for the international operator 115
  e) as the code for national directory enquiries 118.

The use of 112 as a common European number for emergency services does not exclude the parallel use of the...
What is eCall

- eCall is a European initiative intended to bring rapid assistance to motorists involved in a collision anywhere in the European Union.

- eCall is a 112 call. Requirements for citizen access to 112 and the provision of caller location information apply.
eCall Stakeholders

European eCall Implementation Platform – Task Forces
# eCall Legislative Requirements

<table>
<thead>
<tr>
<th>Who</th>
<th>Objective</th>
<th>Legislation title</th>
<th>Implementation deadline</th>
<th>Key requirements</th>
</tr>
</thead>
</table>
| Member States | Enable the reception of eCalls by the Public Safety Answering Points (PSAPs) | [DECISION No 585/2014/EU of the European Parliament and of the Council on the deployment of the Interoperable EU-wide eCall service](https://eur-lex.europa.eu/LexUriServ/LexUriServ.jsf?uri=uriserv:OJ.L_.2014.P.0164.0176.01.05.ENG) (OJ L 164, 3.6.2014 p.6-9) – [LINK](https://eur-lex.europa.eu) | 1st October 2017 | • Free of charge to end users  
• Emphasis on personal data protection  
• Fully deployed across each nation (subject to network coverage)  
• Emphasis on public awareness |
• Automatic and manual triggering  
• Compatible with Galileo and EGNOS positioning systems  
• Optional support for private (TPS) eCall |
(The Recommendation states a deadline of 31st December 2014, but this was extended to 31st March 2016 in the Regulation referenced above.) | 31st March 2016 | • Recognise eCalls through the presence of the eCall discriminator (flag)  
• Route eCalls to the appropriate PSAP through routing tables supplied by the Member State |
eCall Penetration

- eCall regulation applies to ‘new type’ vehicles
- Model cycle typically 4-6 years

Penetration (EU Region)

<table>
<thead>
<tr>
<th>Year</th>
<th>Penetration</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>23%</td>
</tr>
<tr>
<td>2016</td>
<td>25%</td>
</tr>
<tr>
<td>2017</td>
<td>29%</td>
</tr>
<tr>
<td>2018</td>
<td>43%</td>
</tr>
<tr>
<td>2019</td>
<td>56%</td>
</tr>
<tr>
<td>2020</td>
<td>66%</td>
</tr>
<tr>
<td>2021</td>
<td>73%</td>
</tr>
<tr>
<td>2022</td>
<td>80%</td>
</tr>
<tr>
<td>2023</td>
<td>90%</td>
</tr>
<tr>
<td>2024</td>
<td>100%</td>
</tr>
</tbody>
</table>

Source: SBD, OE Services Forecast 2016/2017
**eCall Deployment - Minimise costs. Maximise Opportunity**

<table>
<thead>
<tr>
<th>Early Adopters</th>
<th>Recent Converts</th>
<th>Observers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Five brands have been offering private eCall from before the public eCall decision: BMW, VOLVO, PSA Group</td>
<td>Since, seven additional brands have started offering private eCall: Volkswagen, Land Rover, GM, Mercedes-Benz, Audi, Jaguar</td>
<td>The rest are waiting.</td>
</tr>
</tbody>
</table>

- eCall-type services have been around for many years
- The industry has deployed eCall-like services as part of a bundle of services to customers

Source: SBD
eCall + value-added services

Single SIM Solution and Connectivity Partner for:

- Infotainment
- In-car WiFi
- Telemetry
- eCall

Source: Cubic Telecom
There is no business opportunity in eCall alone. “All vehicles should be equipped with the public 112-based eCall service, regardless of whether or not a vehicle owner opts for a TPS eCall service.” - REGULATION (EU) 2015/758
eCall Profile Characteristics

- eCall-only profile
  - Dormant – no mobility management
  - Privacy by design
  - No subscription

- eCall+VAS profile
  - Always connected
  - Subscription-based service
  - Privacy right waived in subscription agreement

Only one profile can be active at any given time!!
What deployment might look like

Car Assembly Plant

In-vehicle system

embedded SIM (eUICC-ID)

Generic Provisioning Profile With IMSI number
What deployment will look like – cont’d

Option A – eCall Only
Option B – eCall+VAS

In-vehicle system
Embedded SIM with generic provisioning profile

Local profile with new IMSI and telephone number downloaded from the network.
eCall technology

- eCall as required by legislation uses circuit-switched technology on GSM/UMTS (CS eCall) (standardisation began in 2004)
- eCall device has inband modem (voice and date carried on same channel)
- PSAPs need to install inband modems to process MSD
- Next Generation eCall (NG eCall) will be based on IMS (standardisation began in 2013)
- Vehicles could be fitted soon with devices capable of supporting both technologies
- At this point there is no option for PSAPs to future proof investments
- Remember average age of a car on European Roads is around 18 years in some parts of Eastern Europe
PSAP Operator View (Lithuania 112)
Why do we need numbers in the first place?
- eCall is essentially a mobile service
- eCall needs wide geographic coverage and the ability to roam between networks
- Emergency calls from “simless” devices not supported in a lot of European Countries

For network authentication and registration (including roaming) each eCall in-vehicle system needs an International Mobile Subscriber Identity Number (IMSI)
- Each eCall in-vehicle system needs an telephone number (or MS-ISDN or E.164 number) to be able to make a call and present a valid CLI.
- A valid CLI is needed to facilitate callback/location update
ITU-T Recommendation E.212 defines the international identification plan for public networks and subscriptions.

**E.212 Mobile Network Codes and IMSIs for eCall**

National Markets

- **Country A NRA**
- **Country A Operator**
- **Country A Customer**

- Number Assignment
- Service Provision

Global Markets

- **Country A NRA**
- **Country A Operator**

- Connectivity via roaming agreements
SIM / embedded SIM / remote provisioning

- Solution for the installed environment (dust, temperature, vibration)
- Avoid operator lock-in

Source: GSMA
Telephone (E.164) Numbers for eCall

How many numbers required?

270 million vehicles – approx 5% stock renewal each year (13.5 million)

New passenger car registrations in Europe (source: ACEA)

<table>
<thead>
<tr>
<th>Year</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>5 yr average</th>
</tr>
</thead>
<tbody>
<tr>
<td>New registrations (000,000)</td>
<td>12</td>
<td>11,9</td>
<td>12,5</td>
<td>13,7</td>
<td>14.6</td>
<td>12,9</td>
</tr>
</tbody>
</table>

Demand for approximately 13,000,000 new mobile telephone numbers per annum when critical mass of new type vehicles reached (so not anytime soon!)

Numbering Options

- National numbers (assigned by National authorities)
  - Dedicated M2M numbers
  - Mobile numbers

International numbering resources (Assigned by ITU-T)
- +882, +883, +878 number ranges
eCall Life Cycle Management

Vehicle Life-cycle

- **Beginning:** Deals between OEMS and MNOs. Deployment at car assembly plant
- **Middle:** Accidents & Testing (mandatory periodical inspections)
- **End:** Car written/off or reaches end of life naturally. Decommissioning of SIM. Recovery of numbering resources

Stakeholders:

- Vehicle Manufacturer
- SIM/module Manufacturer
- MNO
- National vehicle authority

Link needs to be established between VIN and SIM/eSIM

Source: GSMA
The LCM Task Force is evaluating three options for the end-of-life:

- Define a set duration, renewal before expiration
- Renew duration at regular vehicle testing: good fit with PTI Task Force proposal
- Synchronise with the actual vehicle life time, by mean of a suitable and standard EU process to be defined (PTI Task force)

- Mobile industry in favour of Options 1 and 2
Thank you for your attention!

Access to presentations from ECC Workshop on eCall available [here](#).