GSMA Position Paper on eCall Support and Mobile Network Evolution

22 November 2019

Executive summary

- The GSMA is and remains fully committed to ensure the successful deployment of eCall, both now and in the future cooperating with all relevant stakeholders, including vehicle manufacturers and Member State authorities. This can be traced back to the GSMA's signature of the initial eCall Memorandum of Understanding in 2009, which has more recently been complemented by specific initiatives from the mobile industry to address existing eCall deployment issues.[1]

- As European mobile networks continue to evolve, GSMA members are fully dedicated to fulfil their social responsibility and remain committed to constructive cooperation with all parties involved. All parties in the eCall delivery chain must work together to successfully make the transition happen from Circuit Switch (CS) eCall toward Next Generation (NG) eCall – which is over IP Multimedia Subsystem (IMS). The deployment of 4G/5G mobile networks is closely linked to this transition.

- While eCall was an initiative from the European Union, systems with the same purpose have gained global attention and popularity. Russia, the UAE, South Korea and Israel are in the process or planning to introduce launch similar systems (in each market regulators will make different choices).[2] As a consequence, the automobile industry will have to comply with the technology standards in those countries and regions.

- According to reports, South Korea plans to introduce NG eCall by 2022[3]. In the interest of customer service, harmonisation and interoperability, standardisation on a global scale is to be considered.

- Recognising the benefits of technological evolution, the GSMA considers that all relevant stakeholders should expedite the move from CS toward NG eCall. By doing so, citizens will have access to better and enhanced emergency services, whilst ensuring the efficient use of spectrum.

- Currently, network operators are massively upgrading their network capacities. These investments also foster the future functioning of eCall systems. Especially 4G and 5G technologies will provide a higher network availability and quality of services, as well as harness the potential for enhanced eCall services. Hence, the roll-out of the NG eCall should not be delayed and aligned with 5G deployment plans of MNOs.

- The functioning of the eCall service goes beyond networks of mobile operators and is dependent on all stakeholders contributing to its operation; MNOs on the transport of the communication, car manufacturers on the proper equipment in the vehicle, and the PSAP as the response unit to an eCall. In some instances, MNOs have commercially concluded business contracts with the automotive industry, with many good examples where car

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[1] See for example "Achieving a Digital Single Market for Connected Cars: eCall – implementation status, learnings and policy recommendations", a report commissioned by Vodafone, April 2016, at https://www.vodafone.com/content/dam/vodcom/files/public-policy/ecall-report-final.pdf

[2] Turkey, as a partner the HeEERO project, is testing and validating eCall standards in pilots. http://www.heero-pilot.eu/view/en/heero.html

[3] https://k-erc.eu/korea-rd-research-trends-and-results/korean-e-call-system-research-project/

manufacturers have committed to upgrade the equipment in response to technology evolution.

- At the same time, existing eCall regulation should be updated where required, so that it does not solely refer to CS technology, rather it should be fully technology-neutral (as is standard practice for EU legislation).[4]

- The existing work already underway with respect to NG eCall standardisation and the associated specifications toolbox should be supported and finalised swiftly. Public Safety Answering Points (PSAPs) should also accelerate their infrastructure readiness to enable processing of NG eCall.

- Given the installed base of eCall modules already in the market, which rely on 2G/3G, ensuring continuity of existing eCall services will be essential. In practice, a range of options beyond networks should be explored in this respect (which may include the upgrade of these devices during the vehicle service or as an aftermarket solution).

- All participants involved in the delivery of eCall services can and should do more to raise awareness and provide certainty over their transition plans toward NG eCall. By working together, we can ensure that European citizens can realise the benefits of the improved capability and functionality of NG eCall.

Background and context

Circuit switched networks (initially GSM and then UMTS) have been around for more than 30 years. Since then mobile usage has changed radically from voice to data and mobile communications technology has developed and adapted accordingly – and in that environment eCall only makes a tiny fraction of mobile communications. Over time, 4G and 5G coverage will exceed 2G and 3G coverage. On top of this, NG eCall may well offer a better grade of service and functionality.

The GSMA anticipates that by 2024, 2G and 3G connections will be marginalised in Europe, with just 1% of mobile connections happening via 2G (currently 13%) and a mere 8% through 3G. The vast majority of mobile connectivity will be on 4G (67%) and future 5G networks (23%). Swisscom has reported that only 0.1% of all data is transmitted via 2G while 95% is being transmitted via 4G networks.[5]

Several operators in Europe have announced that CS 2G and 3G networks will be phased out over the next few years and will be replaced with 5G infrastructure[6]. In parts of Asia, the USA and Australia, 2G networks are no longer available, whereas in Taiwan and Thailand the major network operators have already phased out 2G with some operators in those countries still offering 2G services for a limited time.[7]

eCall technology

eCall is an in-vehicle emergency call system mandatory across the EU and beyond for new type passenger cars and light commercial vehicles; once initialised, in-vehicle sensors will automatically[8] trigger an eCall (a 112-voice connection) and send key information about the accident, such as time, location, and driving direction (the Minimum Set of Data, MSD) to the PSAP. In the EU, vehicle

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[4] Regulation (EU)2015/758 of 29 April 2015 refers to CEN technical requirements such as EN 16062:2015 (Intelligent transport systems - eSafety - eCall high level application requirements (HLAP) using GSM/UMTS circuit switched network

[5] Available at https://www.swisscom.ch/en/about/company/portrait/network/2g-phase-out.html

[6] Vodafone has announced that it will not switch down its 2G networks before 2025; T-Mobile in in Netherlands and Swisscom in Switzerland will do so by the end of 2020; Sunrise in Switzerland by end of 2021 and Telenor in Norway by end of 2020. Also in Norway, Telia will shut down 3G by the end of 2021.

[7] Please see https://www.oliviawireless.com/learn-overview/2g-shutdown, and https://nae.global/en/the-status-of-the-2g-3g-network-sunset/

[8] The eCall can also be activated manually

manufacturers must comply with the eCall Regulation[9] in order to obtain valid EC type-approvals for their vehicles. Mobile operators have implemented the eCall discriminator flag in their networks consistent with the eCall Recommendation.[10]

eCall Regulation is complemented by Regulations (EU) 2017/78 and 2017/79 that provide further technical requirements and testing procedures. Currently they only refer to technical requirements and standards pursuant to which, the eCall functionality must be provided over GSM/UMTS, i.e. 2G and 3G, circuit switched networks.[11]

Following technology advancement, the European Telecommunications Standards Institute (ETSI) and the European Committee for Standardisation (CEN), have developed common standards for the deployment of eCall over packet-switched networks (4G/5G), also known as NG eCall. This type of eCall will replace CS eCall in the near future, since there is no circuit switched domain in LTE networks. Related standardisation started in 2013 and was completed in 2017[12]. Deployment of NG eCall is expected to start in 2020 and interoperable chipsets (for both 2G/3G eCall and NG eCall connections) will be available as from the second quarter of 2020.[13]

Following these rapid technology developments, the GSMA has established an internal ad-hoc working group aiming to facilitate a collective action so that MNOs can proactively identify and address possible gaps and challenges in the electronic communications industry and beyond, and ensure a smooth transition from CS toward NG eCall.

NG eCall provides a great opportunity to improve emergency services (also known as *Next Generation eCall*), for example: there is no interruption of the voice path to transfer the MSD, there is lower latency and higher reliability of MSD transfer.[14]

NG eCall would potentially allow enhanced functionality, so that for instance PSAPs to have the ability to use additional media to communicate and receive enhanced emergency features. These features include pictures and video sent to the PSAP, information from nearby vehicles, special sensors that indicate fire, or extreme temperatures. In this regard, PSAPs may also be able to interrogate vehicle sensors through a query such as command to unlock doors, activate a camera, flashlights and even sound the horn.

To ensure that the transition from CS to NG eCall is managed properly, the GSMA suggests the following next steps.

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[9] Regulation (EU)2015/758 of 29 April 2015 (eCall Regulation)
[10] COMMISSION RECOMMENDATION of 8 September 2011 on support for an EU-wide eCall service in electronic communication networks for the transmission of in-vehicle emergency calls based on 112 ('eCalls')
[11] From inception to deployment of eCall it took several years; the deployment of a pan-European eCall service was one of the high priorities identified by the Working Group of experts on Road Safety at the end of 2002.
[12] During 2013-2017: developed by IETF Ecrit for use by 3GPP. During 2015-2016: standardized in 3GPP Release 14 based on RFC 8147. During 2016-2017: Standardization of NG eCall in CEN for inclusion in the EU regulations. It includes requirements for the IVS, MNO and PSAP based on 3GPP and IETF specs.
[13] Qualcomm, ERTICO Next Generation eCall workshop, 10 September 2019.
[14] Ibid

Recommendations

1. Swiftly conclude standardisation work relevant to NG eCall
The remaining standardisation work relevant to testing of NG eCall is expected to conclude soon[15], meaning that automotive manufacturers and IVS suppliers will have the required standards to test and ultimately install NG eCall equipment.

We support the on-going work concerning aftermarket devices (particularly relevant for legacy eCall CS devices), including development of specifications, standards, operating procedures, testing and certification. This will accelerate the swapping of existing legacy equipment in passenger cars and light commercial vehicles, but it will also support eCall implementation for other categories of vehicles in the future.

2. Update existing regulation to provide future proof solutions by applying technology neutral obligations
The EU has reaffirmed ambitious digitalisation goals for Europe and communication technologies continue to evolve at a rapid pace. Therefore, it is imperative that European legislation must aim for full technological neutrality. Considering the current limitation in the e-call regulation only referencing to CS technology, it is a necessity to update the legislation. As part of guidelines to new regulation it is also important to refer to NG eCall related standards.[16] This will provide certainty to all market participants and incentivise and accelerate its deployment. If an alteration to current regulation is not carried out, vehicle manufacturers will be obliged to continue supporting CS eCall and legacy devices leading to an inefficient use of scarce spectrum resources.

3. Relevant stakeholders to work together to expedite the deployment of NG eCall
Technological and network evolution brings many benefits to the economy and society. This includes the unlocking of NG eCall enhanced capabilities which can contribute to the reduction of fatalities and the severity of injuries in road accidents.

It is imperative that we work together to address the lack of awareness in the service value chain – many stakeholders are either not aware of the upgrade implications, or have done little to prepare for it. This is an action for everyone involved: the GSMA representing mobile network operators, vehicle manufacturers, Member States and the European Commission. The GSMA is committed to continuing to foster cooperation beyond the electronic communications industry in identifying gaps, contributing to develop standards, specifications and operating procedures. In general, we need more awareness and acknowledgement of the continuing evolution of technology.

Member States should accelerate the upgrade of their emergency rescue service and PSAP infrastructure to handle eCalls over IMS. PSAPs should be ready to receive IP-based calls, manage multi-media communication, and receive the caller location from mobile devices. That requires completion of impact assessment and an action plan, which should be in place as soon as possible.

Car manufacturers and IVS suppliers should accelerate the deployment of NG eCall by installing the interoperable equipment (2G/3G and 4G capable) to new type approved models as soon as they are available. If participants are committed and willing to engage, we are positive that NG eCall

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[15] TS 103 683, NGN eCall HLAP Interoperability Testing – publication is planned in April 2020. This is being developed by ETSI STF 568
[16] Regulation (EU)2015/758 of 29 April 2015

deployment can be achieved in a relatively short period.[17] There are also a number of options that can be explored in respect of existing vehicles (see further section 4 below).

Otherwise, vehicles that do not support NG eCall will require continuous support for CS eCall from MNOs and PSAPs. Given the estimated vehicle's lifetime (around 13 years[18]) this means that there will be generations of vehicles relying on outdated technology, shifting the point of transition even more out into the future. Maintaining 2G/3G and further delay in encompassing NG eCall will eventually lead to stranded investments.

We look forward to our continued participation in the European eCall Implementation Platform and other related activities where these topics can be further progressed. eCall Pilots will also continue to have an important role to play where all stakeholders (i.e. PSAPs, car manufacturers, MNOs, IVS suppliers) can participate and carry out trials to test the approved standards.

4. A regulatory mandate to maintain 2G and/or 3G support for CS eCall would be unnecessary, disproportionate and could impede future network deployment
It would be both unnecessary, legally questionable and disproportionate for regulation to mandate that mobile operators must maintain 2G and/or 3G network connectivity to support legacy CS eCall devices in the market. Mobile operators already comply with sector-specific rules for provision of access for the public to emergency services and eCall[19] and such obligations are technology neutral; therefore, customers should keep the relevant hardware updated so that it connects to available mobile networks.[20] In that context, MNOs should be capable to placing NG eCall as well as for existing eCall and emergency calls.[21]

Relevant stakeholders should work together to ensure an efficient migration phase and co-existence between CS and NG eCall. The mobile industry is willing to engage and discuss with all relevant stakeholders, including applicable authorities, the automotive industry and IVS suppliers, alternative options for handling legacy CS eCall devices.

Options to explore could include the fostering of aftermarket solutions, installation of new NG eCall-compatible devices as part of the vehicle's periodic services, the availability of a thin 2G network layer for legacy services and the maintenance of one 2G network per country (which is available to other operators through national roaming agreements).

In practice, there will also be a trade-off between any obligation to maintain 2G and/or 3G support and the pace of future new network deployment, in particular 5G. Existing 2G and 3G spectrum will need to be re-farmed to support continued network evolution, which is critical for all sectors of the economy across the EU.[22] A mandate for all mobile operators to maintain 2G support for CS eCall devices for an as yet to be determined period of time would be wholly inconsistent with this.

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[17] The automotive manufacturers (ACEA being one of the first signatories of the eCall MoU) confirmed their commitment to CS eCall and pledged to offer eCall as an option for new type-approved vehicles of certain categories within three years of approval of all relevant standards, provided that Member States updated their PSAP infrastructures to handle CS eCalls.
[18] Commission Staff Working Paper, Impact Assessment, Annex XII, SEC(2011) 1019 final, eCall: Time for deployment" Communication for the Commission COM(2009) 434 final , pg. 5 and also Impact Assessment, Commission Staff Working Paper, SEC(2011) 1019 final, pg. 65
[19] MNOs need to handle eCalls in the same way as they handle 112 calls.
[20] EN 16072 "Intelligent transport systems — ESafety — Pan European eCall- Operating requirements", 2010 states that "If technology evolution means that the initial communication equipment provided in the vehicle will no longer be operational, it is required that adequate notice is provided and that where necessary a viable migration path is provided. Network operators, vehicle manufacturers, equipment manufacturers, technology providers and regulators are relevant for this process."
[21] MNOs have the responsibility to process incoming eCalls in the same manner as they process normal emergency calls save for the additional task of evaluating the eCall flag.
[22] Please see https://ovum.informa.com/resources/product-content/spectrum-refarming-is-key-to-5g-success-glb007-000229