SIM or SIM-less?

The controversy at the heart of the eCall dilemma

While eCall front-runners wait for ETSI to publish a telecoms protocol, car manufacturers are pushing ahead with their own telematics solutions and there is a danger of a gap opening up between public and private systems.

Finland is an enthusiastic supporter of eCall. It was the first country to sign the Memorandum of Understanding and two years ago a schedule for implementation was drawn up. According to this schedule, Finland's PSAPs (Public Service Answering Points) should be ready for eCall by the end of 2008.

But there has been a glitch. Finland, along with the rest of Europe, is waiting for the telecoms protocol to be agreed, and without it, cannot put the last piece of the jigsaw in place.

Compared to some other countries, Finland has found the process of adapting its systems ready for eCall relatively straightforward. The system for handling emergency calls is already accepting enhanced E112 calls. These calls can provide the PSAPs with the location of the caller based on the cellular network. All mobile operators are geared up to provide this data and in the PSAP the location comes up on screen if needed. Looking ahead, the PSAP operators are keen to move to a system using GPS technology because of its improved location accuracy and it is agreed that any additional information included in the MSD (Minimum Set of Data) will be very useful. Anu Laurell of the Finland Ministry of Transport & Communications says that all authorities are looking forward to eCall's implementation.

This may be down to a study funded by the Ministry of Transport & Communications and the Ministry of the Interior which looked at the impacts of an automatic emergency call system on accident consequences which was conducted in 2005. The study involved doctors and was designed to quantify the benefits in terms of lives saved. As Laurell, who directed the research says: 'We tried to answer the question – what would have happened if eCall had been operating and aid had arrived more quickly?'

Putting numbers to research proved difficult, she says. However, the report concluded that eCall could prevent 5-10% of fatalities in Finland but, just as important, would in some cases dramatically improve outcomes for people who suffered injuries. 'We concluded that the biggest effect could be expected on minor rural roads, at night time, in off-peak traffic.' But more lives could be saved with vehicles which are not covered by the current eCall proposition. In Finland, says Laurell, it would make sense to have a system which could be fitted to motorcycles. 'Two-wheelers can travel 30 metres after an impact and on black ice they just disappear. An eCall system for this sector would be very beneficial.'

Finland is now preparing for eCall trials as part of a larger teleFOT programme which is looking at various telematics applications. The plan is to have cars on the road by the end of this year but this depends the telecoms standards being agreed by midsummer. But with so many issues still unresolved, it seems unlikely that the European Telecommunications Standards Institute will report before the end of the year.

Single-vehicle collisions on minor rural roads are those which will benefit most from the introduction of eCall – photos courtesy of Durham Constabulary Collision Investigation Unit

SBD is a leading automotive technology consultancy in vehicle security and telematics. In 2006 it was contracted by the UK Department for Transport to examine the case for deployment of eCall in the UK. The report looked at the business case, as opposed to the Europe-wide case that was being made by the EC, and examined the cost/benefits of implementation. While the report was generally supportive of the initiative, it said the business case was far from made and the UK continues to resist pressure to sign the memorandum.

The reality, however, is that an eCall system is already operating effectively in the UK. Both Volvo and BMW operate commercial services and have adapted their systems to communicate with the PSAPs in the UK using a telematics protocol which was developed in 2003. This protocol, which was drawn up to meet what were considered the essential requirements of the UK's emergency services, differs in several respects from the MoU and the MSD which has been agreed as the European standard.

The current UK system requires the voice call from the vehicle to be routed directly to a Level 1 PSAP – the UK operates a two-level system – whilst the data set is routed via the third party service provider before being delivered to the same PSAP. This allows the third party service providers to add information to the message including the vehicle make, model and registration number, the name of the owner and which crash sensor was used. This last issue is a big differentiator because the MoU only requires the driver's airbag to be deployed while in the UK at least two nominated sensors have to be activated.

On the key issue of SIM or SIMless communication, the UK system comes down on the side of the SIM. In the UK, emergency calls, so by definition eCalls, cannot currently be made without a SIM card. This is to reduce inappropriate 999 calls but also to ensure that emergency services can call the user back if the line is lost.

SIM or SIMless is just one of the technical issues at the heart of eCall which have yet to be decided. In Finland, mobile phones are by law required to be able to make emergency calls even if the SIM card has been disabled. 'We believe this is important,' says Anu, 'as the SIM could be damaged in an accident.'

David McClure is director of ITS and telematics at SBD, which has just released a new report, *Where next for eCall?* It concludes that eCall is an inevitability rather than a possibility, but this may not be the positive endorsement that the EC is looking for. He says SBD is firmly behind the initiative but adds that it is important to get all the issues out in the open to help manufacturers make informed decisions on how they can bring eCall to market as quickly as possible. 'We see eCall as part of a wide range of private telematics services and not simply as a stand-alone application and this distinction is creating barriers between key stakeholders. While the EC's eCall plans remain unresolved, vehicle manufacturers are developing their own solutions.'

These unresolved issues include the business model, the status of private services, fitment strategy and technology. McClure believes that the European Commission, in an effort to keep costs low, is looking for a minimum solution. 'The EC is focussed on getting stand-alone eCall into cars but this is not the best solution for telematics as a whole and the gap is widening.,' he says. 'Car manufacturers are starting to look at what else they can do with the telematics platform both in terms of services to their customers, and for their own internal systems. Manufacturers want an eCall solution which can be optimised for other telematics services.'

Which is why the argument about SIM versus SIMless is central to the eCall dilemma. The EC is trying to develop SIMless systems because they are cheaper. However, if there is no SIM in the car, the functionality is limited to the eCall. A SIM would be essential if there were a requirement to send messages to insurance companies, car manufacturers or other third parties. So from the perspective of the telematics industry, a SIM is essential if additional services are to be offered.

There are other arguments in favour of the SIM, says McClure. 'If there is no SIM, no-one can call the car. PSAPs need to be able to call the car if, for instance, network coverage is lost and the call gets dropped.' One of the reasons that the UK requires a SIM is that it helps to identify false and malicious calls, although this problem may be reduced with eCall which automatically transmits data about the vehicle to the PSAP.

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One solution would be the eCall flag. This proposal would place an identifier on the call to allow operators to distinguish a call from a SIMless phone from a call from a car. The technical requirements for an eCall flag have been discussed but not progressed. Certainly, an eCall flag would help countries like Germany and France, which have hundreds of PSAPs and which face an uphill battle to convert them all for eCall, by filtering out eCalls and possibly routing them to a single PSAP.

SIM or SIMless also impacts on which data bearer is used. Mobile operators, who are key stakeholders in eCall development, face the nightmare scenario of 15 million new cars being produced each year, equipped with embedded eCall technology, roaming around Europe through the networks to enable a call which might be made once every 10 years. Not surprisingly, they are looking for the solution which is most transparent to their network and presents the least cost and the least hassle.

If there is to be no SIM, then SMS messaging is ruled out. For some time the data bearer that was emerging as the front runner was in-band modem. It differs from SMS in that both voice and data elements of the eCall are transmitted via the same GSM channel – the SMS system effectively separates the elements with the voice being delivered by one channel and the data element of the call being delivered by SMS message. There are pros and cons. For Anu Laurell, the SMS solution introduces uncertainty – in some cases there can be long delays in delivery, and she believes that in-band modem will be quicker. On the other hand, with in-band modem there is an inherent delay in transmission of the voice element because the data is sent first.

In-band modem is a generic term but the solution is being heavily canvassed by Airbiquity which has successfully deployed the system in North America with more than three million units in service. The attraction is that it can be rapidly deployed with no impact on existing wireless infrastructure. ETSI is currently deliberating but indications suggest that in-band modem will be the recommended way forward.

Laurell says that Finland would be happy with this result but with an open standard, not a proprietary technology which would involve licensing costs. Finland is not alone in this. An alternative in-band modem system has been developed by Ericsson, as a Cellular Text Modem which has the benefit of having no licence fee. The downside is that it is slower.

McClure says that if the EC goes ahead with a minimum SIMless solution, in-band modem makes sense. But this only serves to illustrate the divide that is opening up between stakeholders. Car manufacturers are now looking at telematics options and mobile operators, which see nothing but cost in a minimum system, would have plenty of business opportunities in a fully-enabled telematics package.

And there are plenty of options out there. One potential solution is a new initiative from Bjorn Steiger Stiftung aimed at supporting the deployment of eCall services.

As a public safety foundation, BSS developed eCall on a not-for-profit basis. Its eCall infrastructure is already operational in Germany where BSS is working with Mercedes-Benz and Volkswagen, developing a roll-out plan that will extend its coverage across Europe from the end of 2008.

The BSS solution uses SMS technology with the voice call going directly to the PSAP. Data is routed to the PSAP via a BSS server, which mimics the data-routing system that operates in the private sector and is used by Volvo and BMW in the UK.

Jasper Wireless, which is a network operator dedicated to M2M operations, also believes it has a solution to many of the issues that are troubling stakeholders. Chief technical officer Daniel Collins says they are watching car manufacturers very closely as they grapple with eCall. 'It is possible to put together an eCall system without a SIM but that is not what the vehicle manufacturers are telling us they want.

'When they talk eCall, they also say bCall (breakdownCall) because it is the additional revenue-generating services they can offer, such as bCall, that interest them. But if they go down that route and there is a SIM in the car, it raises a whole host of issues. If cars are rolling off the production line in Turin, and being shipped all over the world, the manufacturer does not want to have to put in a different SIM depending on where the car finally goes.'

The solution Jasper Wireless offers is a single SIM that operates across borders. 'The reality is that wireless is still built around national boundaries and there are problems as you move from one network operator to another or if you wish to deploy a solution that spans borders. We can give vehicle manufacturers a single SIM, which can be embedded in the vehicle, and will activate automatically on arrival at destination. It will work wherever it is, so there is no need for different configurations for different markets, no issues relating to roaming.'

Collins believes that the SMS lobby will come out on top. 'In my view to mandate a SIMless solution would be penny wise and pound foolish. Why settle for the minimum?' He says that he would favour Unstructured Supplementary Service Data, which is widely used by European operators, as the bearer. 'USSD has all the advantages of SMS but is much more real time.'

The latest news from ETSI suggests that Collins' support for SMS may prove sound. In-band modem would result in a delay of up to 20 seconds before the voice traffic can begin, and this is regarded as unacceptable in an emergency call-handling environment. As a result ETSI has set a requirement to reduce this to a maximum of five seconds. Five manufacturers are currently working on delivering a technical standard that will provide this, although three of them are looking at VoIP solutions which is a technology that is arguably not yet mature enough to form the foundation for eCalls.

In the meantime, the lobby to retain SMS is gaining strength, strongly supported by both France and the UK. But while this technical dilemma remains, plans to upgrade PSAPs all over Europe are on hold.

If ETSI were finally to select in-band modem as the solution, there is a risk of a divide opening up between the key stakeholders who are necessary for the successful deployment of eCall. David McClure says that there is now a race on between the European Commission's public eCall service and emerging private eCall services developed by vehicle manufacturers. 'Public eCall may be bypassed by vehicle manufacturers developing their own private services unless the open issues can be fully resolved during 2008.'

The report *Where Next for eCall?* is available from SBD. Contact David McClure by email at davidmcclure@sbd.co.uk or visit www.sbd.co.uk

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