



The paths to broadband public safety solutions

Peter Gould examines the different paths being taken around the world to deliver mobile broadband communications to the public safety community

Once operational, The FirstNet Network will create a US-wide, interoperable broadband public safety network

The TETRA technology and other digital narrowband technologies have served the public safety community extremely well over the last decade or so and these systems are still actively being used and deployed in many parts of the world, a situation that is likely to remain the case for many years to come. However, the narrowband nature of these technologies means that they are unable to provide effective support for many data services (e.g. web browsing, video streaming, file download) that have become a part of everyday life in other sectors. In February 2011, this led the New York City Police Commissioner, Raymond W Kelly, to remark to the US Congress that: “Today, a 16-year-old with a smart phone has a more advanced communications capability than a police officer or deputy carrying a radio. Given the technology that is available, and the complexity of the threat we face, that is unacceptable.”

A number of countries around the world are now actively working towards the delivery of reliable, resilient and secure mobile broadband solutions for the public safety community and several distinct approaches are starting to emerge. In this article some of these approaches are highlighted and their paths towards the delivery of mobile broadband communications are examined.

The FirstNet network in the US

In February 2012, motivated by the evidence provided by the New York City Police Commissioner, amongst others, the US

Congress allocated 20 MHz of radio spectrum and USD7 billion to create a nationwide, interoperable broadband public safety network based on the LTE technology. Initial estimates suggest that this network could consist of around 35,000 cell sites. The organization responsible for the creation of this network, FirstNet, has recently agreed a business plan for 2014, which includes developing effective arrangements with network partners, developing designs and standards for the network’s distributed core and working with local government organizations on regional initiatives. This work is being supported by the Public Safety Communications Research (PSCR) laboratories, which are building a public safety demonstration network to allow conformance and performance testing of different equipment solutions.

The FirstNet network will initially be designed to augment, rather than replace, the existing land mobile radio (LMR) systems that are in use today and ways will be found to seamlessly integrate these systems with the FirstNet network. This removes the immediate pressure for the LTE technology to support mission-critical voice services, since these can be supported by the LMR networks for the foreseeable future. The FirstNet network will also place a significant reliance on rapidly deployable infrastructure to provide coverage in remote locations or in situations where the local infrastructure has been rendered inoperable, e.g. as the result of a hurricane.

The Emergency Services Mobile Communications Programme in the UK

The UK currently has a nationwide TETRA network that is being used by the three emergency services (3ES) that was built based on a private finance initiative. However, the contracts for the use of this network will expire between 2016 and 2020 and the UK Government's Emergency Services Mobile Communications Programme (ESMCP) is seeking to provide an integrated critical voice and broadband data Emergency Services Network (ESN) from 2016. ESMCP also has the aim of finding a more cost effective solution than the existing dedicated TETRA network and, therefore, it is intended to make extensive use of commercial LTE voice and broadband data networks to provide a 'core' voice and data service and augment this with specialized solutions when necessary. The contractual situation in the UK means that ESMCP is planning a transition from the existing TETRA network to the LTE ESN over the 2016 – 2020 timeframe, with the migration plan being driven by the expiry of the current contracts. This puts an intense focus on the current standardization and development work to allow LTE to support 3ES-specific functionality (e.g. group communications, proximity-based services) and mission-critical voice. The ESMCP team has become increasingly confident through its recent market engagement work that the commercial networks in the UK will be able to deliver the necessary service levels to accommodate this transition timeframe, but the view expressed by the TETRA and Critical Communications Association's (TCCA's) Critical Communications Broadband Group (CCBG) in February 2013 that 'adequate voice services over LTE are not expected until at least 2020' suggests there is not universal agreement over when LTE will represent a viable replacement for existing narrowband mission-critical networks.

The Blue Light Mobile initiative in Belgium

In Belgium, the existing nationwide TETRA public safety network operator, ASTRID, is planning to provide its customers with a broadband data service by providing them with access to the country's third generation (3G) networks via a mobile virtual network operator (MVNO) arrangement known as Blue Light Mobile. From Spring 2014, ASTRID will be able to issue subscriber identity module (SIM) cards that will provide a user with priority access to the commercial third generation (3G) networks. The coverage provided will be maximised by allowing the user to roam to other national networks if the 'preferred' network is not available. In the future ASTRID plans to extend this service offering to the commercial 4G LTE networks.

Different paths, but the same destination

These three examples show that the public safety community is migrating towards the use of the LTE technology to support mobile broadband data communications and, ultimately, as a replacement for the existing narrowband mission-critical voice networks. Local circumstances are leading countries to adopt different approaches, but the selection of a single mass market technology will bring economies of scale that will provide benefits regardless of the route taken. There are still many challenges to overcome and it remains to be seen who has chosen the best path for the journey ahead, but we can be sure it will be an interesting ride.

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Digital broadband will provide coverage in remote locations or in situations where the local infrastructure has been rendered inoperable (FirstNet)