

## **Motorola Solutions: Risk to Motorola's Pricing Power in Emergency Responder Device Market as Muni RFPs Shift to Interoperable P25 Networks that Will Drive Competition; Outlook for FirstNet Timing, Implementation**

### **Outlook for Emergency Responder Device Market and FirstNet**

**More competition likely to result in risk to Motorola Services.** Emergency device stakeholders are interested in the development of the emergency responder device market and whether or not it will continue to be dominated by Motorola Services. According to interviews and an analysis of municipal RFPs, we have found that political factors are driving municipalities to demand interoperability and device neutrality in RFPs for emergency responder networks. Such demands are likely to lead to a more competitive device market in the near term. This shift is likely to result in competition on price, quality, and innovation and, also, a likely decrease in profitability and dominance for Motorola Solutions in the device market.

**Outlook for FirstNet.** Sources indicate that FirstNet, the independent authority tasked with building, deploying and operating a nationwide public safety broadband LTE network, is likely to remain on track with its May 31 deadline for proposals for the operator contract; Verizon, AT&T and Rivada Networks appear to be strong bidders for the contract, which is set to be awarded by November 2016. In the longer-term, it remains an open question whether or not FirstNet's network will obviate and entirely replace land mobile radio (LMR) networks, technology and devices. That said, FirstNet continues to progress toward implementation, and the principles of the new network will continue to drive the trend of an open, interoperable, and competitive device market.

While this article focuses on the shift toward interoperability, standardization and neutrality of emergency networks, future articles will further explore municipal device purchasing habits as well as competition in the market for emergency network services.

### **Near-term: RFPs for Municipalities Shifting from Non-Interoperable Networks that Favor Motorola to Interoperable, P25 networks that are Device-neutral and Will Drive Competition in Device Market**

**Motorola enjoys dominant position, pricing power in device market.** Motorola Solutions and its supporters suggest that the company enjoys monopolistic pricing in the device market for a number of reasons, including a strong brand, a history of producing the highest quality and most reliable product, and great relationships with purchasers. However, in addition to these reasons, Motorola also enjoys a dominant position because LMR networks in the U.S. are not interoperable with other LMR networks and also do not function seamlessly with products produced by competitors.

**Entrenched technology, restrictions on compatibility.** Motorola has been able to leverage its position as the standard by entrenching its systems with proprietary technology. When municipalities have opted to purchase from one of Motorola's competitors in order to save money, they often face an incredibly challenging technological and financial burden. Motorola has built numerous proprietary features into its devices that render them incompatible with non-Motorola systems.

In order to switch manufacturers, a municipality would have to completely junk their entire system, from the handheld radios to the transponders and dispatch systems, into which they have already invested large sums of

money. Even when two municipalities are using Motorola systems, these proprietary features (as well as features unique to the needs of the corresponding agency, such as different bandwidths for urban/rural areas) have resulted in incompatibility between communications systems. Fire chiefs responding to wild fires, which require aid from several different areas, often have to bring multiple radios with them to ensure effective communication, for instance.

**“Strong relationships” increasingly lead to allegations of corruption.** A [seven-month McClatchy investigation](#) found that Motorola has cozied up to federal, state, and local leaders, as well as police and fire chiefs, to gain no-bid contracts. When competitive requirements can not be bypassed, Motorola has worked closely with officials to craft requests specifically tailored to favor Motorola products; one request specified that knobs on radios had to be exactly 19 millimeters apart, a detail that only fit Motorola’s radios.

**Shift toward interoperable, device-neutral networks and technology threaten Motorola’s dominance in device market.** According to sources, and based on a close look at the language of municipal RFPs related to LMR networks and technology, municipalities are demanding interoperability and device-neutral systems. An analysis of local LMR RFPs from across the country have indicated that municipalities are stressing interoperability of both devices and networks as fundamental to the award of the contract. Key to this request for interoperability is the request for networks and devices to be compliant with the P25 radio standard, a digital system which allows for manufacturer-agnostic communications.

For example, Wicomico County, Maryland, represents the changing attitudes of local municipalities to entrenched LMR systems and companies, specifically Motorola. Despite currently operating a fully end-to-end Motorola 800MHz SmartNet LMR system, the county’s recent [RFP](#) indicated that it was open to any system that improved interoperability between devices and regional networks regardless of manufacturer: “It is the intent of Wicomico County to avail itself of the full benefits of the P25 interoperability platform as it applies to subscriber equipment operating on the system. All Proposers offering to supply subscriber equipment shall certify that their units will operate on more than one vendor’s system (e.g., EF Johnson, Harris, as well as Motorola and/or other P25 radio systems) ... The Prime Vendor shall certify and design the radio system to interface with at least two (2) mobile/portable Vendor subscriber units, excluding the Prime Vendor’s own mobile and portable radios... All subscriber equipment shall be 700/800 capable... P25 Phase I/Phase II capable... [and] interoperable with all interoperability partners [which include neighboring counties that operate the Harris EDACS system].”

This demand for P25 compliant devices that can scale and communicate with neighboring jurisdictions appears frequently in recent RFPs from across the nation. The [Waukesha County, Wisconsin, P25 RFP](#) states that the aim of the project is “to provide and implement a Project 25 (P25) 800 MHz digital trunked radio system (to include a Shared Core and multiple simulcast subsystems) that will serve both Counties [Waukesha County and Milwaukee County]. The Counties will require that the radio system have the capacity and scalability to serve other jurisdictions, as well as have the functionality to interface with the Wisconsin Interoperable System for Communication (WISCOM) for occasional interoperability.” (Other recent local RFP’s with similar P25 interoperability language can be found [here \(GA\)](#), [here \(AZ\)](#), [here \(VA\)](#), and [here \(NC\)](#).)

The Wicomico County RFP also makes it clear that it does not see the awarded contract as being exclusive to one vendor, for the county “may elect to purchase a mix of different vendor’s radios as part of this offering” and “reserves the right to negotiate and award only a portion of the requirements... [and] to negotiate and award separate or multiple contracts for the elements covered by this RFP in any combination it may deem appropriate.”

The Wicomico RFP also stands as an example of wariness of public safety entities (PSE) for the technology of public safety LTE. The RFP states that though “Wicomico County is strongly supportive of the concepts behind the possible implementation of FirstNet in Maryland... Wicomico County is also aware that at the time of cutover onto the new system FirstNet will not be operational within the County.” The RFP calls for a 15-year period in which the requested LMR network will remain the primary mode of PSE communication, with “scalability” to incorporate future improvements to LTE communications, including the adoption of the FirstNet network. Other recent local RFP’s have indicated a 20-year window of operations for LMR technology.

While these 15 and 20-year waiting periods for full incorporation of the FirstNet network/LTE provide a lifeline to LMR technology, the overwhelming requirements for interoperability has had a great effect on the device market for LMR. Municipalities now find that they can purchase their devices from a variety of non-Motorola vendors. The Department of Homeland Security’s [list of approved P25 devices](#), which detail devices that meet interoperability standards and are eligible for government emergency communications grants, lists devices from Harris, Kenwood, ICOM, Tait, and Relm in addition to the line of Motorola products.

### **Political Interest in Improving Emergency Devices, Networks, and Technology following 9/11: SCIPS, NPSCT, DHS, FirstNet, GAO**

This section takes a look at how political pressure has led to an across-the-board push for network and device interoperability as well as competition and device neutrality.

**FirstNet and the vision for an interoperable LTE-based first responder network to replace LMR.** When the south tower of the World Trade Center collapsed, rescue personnel in the north tower were given the order to evacuate. However, many did not hear the order because their channel was overwhelmed by traffic, they were on the wrong channel, or they were off-duty rescuers who had responded without their radio. Additionally, communications during 9/11 were seriously hampered by incompatibility between the NYPD and FDNY LMR system.

The 9/11 Commission report [recommended](#) the establishment of a broadband radio spectrum for public safety use, and that devices and systems on that network be interoperable. At the same time, advances in smartphone technology and data systems created commercial networks by which more complex data, such as photographs, video feeds, and building plans could be sent to first responders; many were beginning to use their private smartphones in conjunction with their LMR systems. From these two developments, the [First Responders Network Authority](#), or FirstNet, was created by an [act of Congress in 2012](#).

FirstNet is tasked with building, deploying, and operating a nationwide public safety broadband LTE network. The FCC allocated Band 14 of the 700 MHz spectrum to become the backbone of this new network, and the recent [FirstNet Request For Proposal](#) seeks a contractor to develop and operate the network for emergency personnel, with an initial \$6.5 billion in funding for construction and a ceiling of \$100 billion over 25 years. In addition to building and operating the Band 14 network, the contractor is allowed to sell excess capacity commercially.

FirstNet seeks to create a nationally integrated emergency communications network that allows interoperability between devices and agencies, as well as the integration of modern LTE data capabilities. Additionally, a main priority of FirstNet is the creation of a competitive ecosystem of interoperable devices and applications that can

be created by third-party developers, much like the App Store for the iPhone and Google Play for Android devices. The FirstNet RFP lays out a number of conditions that seek to not only improve communication between emergency personnel, but also to break the monopoly that Motorola Solutions has held over the industry for years:

1. The network must support a “Bring-Your-Own-Device” framework, in which devices made by multiple manufacturers will be able to access the network. This also extends to visiting emergency personnel, who will be able to bring their own devices with them when responding to an out-of-state emergency.
2. The RFP stresses that all devices must be able to access the Band 14 spectrum, and that no proprietary systems exist in the operating system or sim card of the device. The “interoperability” of these devices is stressed numerous times throughout the RFP. This interoperability extends to the application marketplace that will be developed and maintained by FirstNet.
3. The FirstNet network must support mission-critical voice and push-to-talk, two capabilities that have formed the core of Motorola’s appeal.
4. As a nationally-compatible network, the FirstNet network enables government agencies to increase their monopsony power.
5. The RFP stipulates that the government has a contractual \$3500 minimum for orders from contractors, which may greatly increase an agency’s choice when purchasing individual radio handsets.

**SCIPS.** When the events of September 11<sup>th</sup> laid bare the problems of interoperability between public safety agencies, individual states did not wait for federal action and began to create their own plans to increase interoperability. This movement, combined with the interoperability requirements of the FirstNet network, have begun to act as a guide for municipalities when issuing device and network procurement requests. Nearly every state in the nation has issued a Statewide Communications Interoperability Plan (SCIP), which lay the groundwork for both short-term improvements in LMR interoperability and long-term steps towards consolidating state-wide communications under the FirstNet network.

An analysis of several SCIPs from across the nation indicate a pattern of states identifying proprietary technology as an impediment to communication, and encouraging local agencies to either upgrade their LMR networks to the P25 standard, which allows for manufacturer-agnostic communication, or reprogram current systems with “gateway” functions to integrate currently disparate networks. As an example, the [Rhode Island SCIP](#) makes it clear that to receive any state or federal grants, “subscriber radios purchased must be programmed with the mutual aid and the national interoperability channels within that radio’s frequency band... [and] equipment for communication system development and expansion... will be compatible with applicable Project 25 (P25) standards and the Rhode Island Statewide Communications Network (RISCON).”

**Federal Recommendations, Grants for P25.** The National Public Safety Telecommunications Council (NPSTC), a federation of organizations including industry advocate groups and government agencies like the FCC, FEMA, DOJ, and DHS, created their Interoperability Committee to provide recommendations for states and local agencies to improve the interoperability of communications.

The NPSTC Interoperability Committee has overwhelmingly embraced the P25 standard for public safety agencies, and has recommended that agencies not implement any other system: “P25 is not the only digital land mobile radio technology available. Digital LMR technologies such as DMR, MPT1327, and TETRA are widely used outside the U.S. and hold the dominate market position in other parts of the world. Recently, some public safety and critical infrastructure agencies here in the US have been opting for these and other disparate technologies that are not compatible with P25. Not only does this pose a virtually insurmountable technical hurdle for successful interoperability, it potentially negates billions of dollars’ worth of investment in P25 LMR systems... NPSTC strongly urges public safety and critical infrastructure agencies contemplating the purchase or use of LMR equipment to opt for *P25 Phase 11 (12.5 kHz conventional FDMA) and/or analog modes for interoperability* [emphasis in the original].” ([Non-P25 Digital Technologies Will Negatively Impact on Hard-Won Advances in Public Safety Interoperability](#)).

The federal government has followed through with these recommendations by requiring public safety agencies to upgrade to P25 if they want to access federal grants for emergency communications. The Department of Homeland Security’s [2016 Guidance on Emergency Communications Grants](#) makes it clear that P25 is the federal government’s preferred system for interoperability improvements. According to the document, “to maximize opportunities to improve interoperability across investments, grantees should ensure that digital voice systems and equipment purchased with Federal grant funds are compliant with the P25 suite of standards, unless otherwise noted in a program’s grant guidance.” Additionally, five of the seven steps in the best-practices section for upgrading LMR require P25 compliance of procured devices, while the remaining two require agencies to detail why non-P25 compliance is required and how the agency will deal with interoperability problems arising from non-P25 systems.

**In 2012, GAO identified monopolization in the LMR market.** A GAO [report from 2012](#) analyzed the framework of emergency responder communications around the country. The report found that the tens of thousands of agencies in charge of emergency response were fragmented based on a few technical factors, leading to interoperability challenges for responders during disasters. GAO said the effort to create a nationwide network through FirstNet would eventually increase interoperability, though that was likely a decade or more off because of remaining hindrances to providing mission-critical voice communications.

GAO pointed to the lack of competition within the LMR market was an undue financial drain for many emergency response agencies. The GAO report recommended that DHS, which has an existing relationship with local and state emergency response agencies through information sharing, coordinate opportunities between jurisdictions to pursue joint procurements. DHS coordination would give municipalities buying power and economies of scale, thereby lowering prices. At the time, DHS agreed with GAO’s assessment that LMR prices were too high.

Ultimately, the GAO report served as political pressure to reform the market, which FCC, FEMA, DOJ, and DHS have pushed for, not through giving municipalities greater buying power, but by focusing on interoperability, technological standardization, and competition.

**Longer-term: FirstNet Network Moves Closer to Implementation, but the FirstNet Network’s Ability to Obviate LMR Networks and Tech in the Near Term Remains Open to Debate**

The FirstNet network's ability to provide mission-critical voice functions will have a direct impact on the lifespan of LMR technology. While it may take agencies some time to trust the PTT features of LTE devices enough to replace their LMR networks, there have been several advancements in LTE PTT that point to a technological crossover within the next two to three years:

1. Commercial PTT features have been incorporated into the networks and devices of several large wireless carriers, including Verizon, Sprint, and AT&T, all of which have expressed interest in contracting for the FirstNet network.
2. 3GPP, the international standards body for wireless telecommunications, recently [approved the standard](#) for Mission-Critical PTT over LTE, setting the introduction for early 2018, expediting product development. Importantly, this standard allows for MCPTT to operate even when disconnected from the large LTE network, the same direct-mode communication that has formed the core of LMR technology.
3. Samsung successfully tested, [and is currently constructing](#), a Public Safety LTE system in South Korea that supports MCPTT.

FirstNet's RFP calls for MCPTT to be available to over half of the country by late 2018, which conforms to the 3GPP standards and timeline. However, FirstNet appears to be more concerned with the construction of the network and its adoption by as many agencies and municipalities as possible, instead leaving the implementation of MCPTT to product developers. At the IWCE, Dean Prochaska, FirstNet's director of standards, [said that the markers set out in the RFP](#) "are just targets that we've set out there" and that MCPTT deployment could depend on the product-development cycles pursued by vendors such as Motorola and Harris.

"Our first focus is that this is a data network," Prochaska said. "Within the RFP, we have targeted timelines for other types of things to eventually merge, but that could be a long time in the future. We're more concerned about data," indicating that FirstNet also envisions the data power of LTE devices supplementing, rather than replacing, LMR handsets and networks for the next few years.

## **Timeline**

A timeline of expected action for the FirstNet network's development as well as important dates for Motorola include:

- May 31st: Deadline for proposals from potential contractors.
- November 2016: Contract awarded.
- May 2017: Processes and procedures to allow an agency to deploy a Bring-Your-Own-Device approach on the network established, greatly increasing the portfolio of non-Motorola products.
- May 2017: Commence non-Band 14 operations for other devices, including non-Motorola products.
- November 2018: FirstNet network core is online and operational.
- November 2018: Half of network, by population, supports Mission Critical Voice Over LTE and Push to Talk, a major step away from LMR.
- November 2019: Complete national Mission Critical Voice Over LTE and Mission Critical Push-to-Talk.

- November 2019: Steady stream of new third-party public safety applications being developed, certified, and published to the FirstNet applications store.
- November 2020: Mission Critical video added.

If the FirstNet network, regardless of who wins the contract, is able to meet these structural and technical deadlines, it will only be in 2019 that the system begins to offer a real technological edge over current LMR network technology through its application marketplace and MCPTT. It remains to be seen how comfortable PSEs will be with adopting full LTE networks, and a combination of interoperable LTE/LMR systems and devices seems likely to remain in place even after 2019.