

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554**

Public Safety and Homeland Security Bureau)
Seeks Comment on Increasing Public Safety) PS Docket No. 10-168
Interoperability by Promoting Competition for)
Public Safety Communications Technologies)

COMMENTS OF MOTOROLA, INC.

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I. INTRODUCTION AND SUMMARY

Motorola, Inc. (“Motorola”) submits these comments in response to the Federal Communications Commission’s (“Commission”) Public Notice that seeks comment on how the public safety communications equipment marketplace impacts interoperability.¹ Motorola applauds the Commission’s interest and leadership in promoting interoperable public safety communications. With more than 70 years of experience in the sector and decades of working collaboratively with public safety officials, Motorola has invaluable insight into the challenges the Nation faces in achieving the goal of national interoperability – namely, ineffective state and regional governance of interoperability issues and disjointed allocations of public safety spectrum.

But instead of addressing the real obstacles to interoperability, the Public Notice focuses on public safety equipment competition, seeking comment on whether “additional competition in the provision of public safety communications equipment [would] improve narrowband or

¹ *Public Safety and Homeland Security Bureau Seeks Comment on Increasing Public Safety Interoperability by Promoting Competition for Public Safety Communications Technologies*, Public Notice, DA 10-1556, PS Docket No. 10-168 (Aug. 19, 2010) (“Public Notice”).

broadband interoperability” and, if so, how the Commission could improve competition.²

Unfortunately, the Public Notice fails to acknowledge that vibrant competition already exists in this sector: competition driven by the Project 25 suite of interoperability standards (“P25 standards”). The P25 standards – which establish interoperability between different manufacturer systems and equipment – have created a competitive environment in which approximately *thirty* manufacturers and providers offer a wide array of equipment and services to public safety customers.

Setting these facts aside, the Commission compares competition in the public safety and commercial equipment marketplaces. Such a comparison is misguided. There are considerably more customers with relatively straightforward communications needs in the commercial market, which explains why some vendors may choose to instead serve that sector rather than the smaller public safety marketplace that has more exacting technical and operational demands. Focusing the Commission’s limited resources on competition in the public safety equipment marketplace will do nothing to achieve the goal of nationwide public safety interoperability.

The Commission also has requested comment on the impact on interoperability of the P25 standards as well as “open standards” more broadly.³ The national, consensus-based P25 standards for voice and low-speed data communications have successfully fostered interoperability in the public safety sector, which in turn has driven competition and significant advances in communications functionality. The Commission should reaffirm its support for the P25 standards and recognize the critical role played by the manufacturing industry in fostering

² *Id.*

³ *Id.*

narrowband interoperability across much of the country – a role the industry is poised to replicate with broadband interoperability.

While great strides have been made with the development of interoperable public safety networks for narrowband communications, the development of a nationwide broadband interoperable public safety network is still in its nascent stage. But the Commission has an opportunity to promote the interoperability of broadband public safety networks, as it correctly recognizes by seeking comment on 700 MHz broadband public safety networks.⁴ To accomplish its interoperability goals, the Commission should take the following two actions relating to 700 MHz: first, select LTE as the common air interface for all 700 MHz broadband public safety networks; and, second, work with Congress to repurpose the 700 MHz D Block for broadband public safety systems. Together, these actions will most effectively allow the Nation to realize the goal and benefits of interoperable public safety broadband communications.

II. THE PROJECT 25 INTEROPERABILITY STANDARDS HAVE PROMOTED INTEROPERABILITY AND SIGNIFICANT COMPETITION IN THE PUBLIC SAFETY COMMUNICATIONS EQUIPMENT MARKETPLACE.

P25 interoperability standards play a vital role in interoperable first responder voice and low-speed data communications. As detailed below, the P25 standards are unique in that they were developed and have evolved based on specific requirements from the public safety user community.⁵ “From the beginning,” the standards were designed for use by federal, state, and local public safety agencies in North America for “effective, efficient, and reliable intra-agency

⁴ *Id.*

⁵ The suite of standards are administered and maintained by the Telecommunications Industry Association (“TIA”). *See* “Public Safety Radio Communications: The Wireless Industry to the Rescue,” Telecommunications Industry Association, http://www.tiaonline.org/standards/technology/project_25/.

and inter-agency communications.”⁶ The standards were also designed to “ensure competition in system life cycle procurements ... so agencies can choose from multiple vendors and products, ultimately saving money and gaining the freedom to select from the widest range of equipment and features.”⁷

To date, the P25 standards have succeeded on both counts. First, the P25 standards facilitate interoperability by providing for backward compatibility, interoperability across system boundaries, open interfaces to radio frequency subsystems to facilitate interlinking of different vendors’ systems, and future interoperability by enabling public safety users to migrate to new, compatible bands while re-using existing spectrum. Second, because the standards are open to all manufacturers at fair and reasonable terms, many manufacturers compete in this area. Indeed, Motorola supports the competitive goals of P25 and therefore licenses its essential patents for no fees.⁸ Thus, it can not be argued that patents and other intellectual property discourage the participation of new vendors in providing P25 equipment. Indeed, P25 networks cover nearly 70 percent of the population, and approximately *30 manufacturers* are currently competing in the marketplace.⁹

⁶ “Technology Benefits,” Project 25 Technology Interest Group, <http://www.project25.org/technology/technology-benefits>.

⁷ *Id.*; *see also* “Public Safety Radio Communications: The Wireless Industry to the Rescue,” Telecommunications Industry Association, http://www.tiaonline.org/standards/technology/project_25/ (explaining that P25 technology “foster[s] competition and achiev[es] cost-effective emergency/safety communications solutions”).

⁸ Letter from Rich Barth, Motorola, Inc., to Magalie Roman Salas, Secretary, FCC, WT Docket No. 96-86 (received Oct. 5, 1999), <http://fjallfoss.fcc.gov/ecfs/document/view?id=6009552955>.

⁹ *See infra* at Sections II.C. and IV.

There is widespread agreement – by public safety entities and equipment manufacturers – that P25 standards foster competition and interoperability.¹⁰ Although the Public Notice suggests that the P25 standards and the present state of competition are throttling interoperability, nothing could be further from reality. While work certainly remains to achieve nationwide interoperability, the Commission should not discount the critical role that the P25 standards and the existing competition play in interoperable communications.

A. Public Safety Entities – Working with Equipment Manufacturers – Created the P25 Interoperability Standards and Remain Intimately Involved in the P25 Specifications.

For over twenty years, public safety agencies have driven the development of the P25 interoperability standards. The standards were launched in October 1989 when the Association of Public Safety Communications Officials (“APCO”), National Association of State Telecommunications Directors (“NASTD”), National Communications System (“NCS”), National Telecommunications and Information Administration (“NTIA”), and National Security Agency (“NSA”) agreed to the creation of the APCO-NASTD-FED Project 25.¹¹ The standards were designed for use by federal, state, and local public safety agencies to enable them to communicate with other agencies and mutual aid response teams in emergencies. In 1995, the conventional standard was initially baselined, enabling multiple competitors to begin developing products. In 2001, the trunking documents were added to the P25 standards, opening the door for multiple vendors to develop wide area systems. This Phase 1 standard has now been

¹⁰ See *infra* at Sections II.B. and II.C.

¹¹ “White Paper: Project 25 Standard: Interoperable Communications for Public Safety Agencies,” Motorola, Inc., at 2, http://www.motorola.com/staticfiles/Business/Solutions/Business%20Solutions/Mission%20Critical%20Communications/ASTRO%2025%20Trunked%20Solutions/_Document/Project%2025%20Whitepaper.pdf?localeId=33 (“Motorola White Paper”).

supplemented by Phase 2. In addition, maintenance is done on a regular basis, as is appropriate for all widely used standards, such as GSM and LTE.

To this day, the public safety community continues to drive the P25 standards. The P25 Steering Committee, for example, consists of a select group of public safety leaders: three representatives from the federal government, four representatives appointed by APCO, and four representatives appointed by NASTD.¹² The Steering Committee decides the priorities and scope of technical development for the P25 standards. Public safety representatives also participate in the standards development process through the P25 User Needs Sub-committee, which defines and prioritizes user requirements for possible P25/TIA standardization. Public safety officials can also be a member of an APCO Project 25 Interface Committee (“APIC”) Task Group, such as the TDMA task group which serves as the venue for drafting the standard documents. It is clear that public safety entities – both large and small – have multiple platforms to maintain the P25 standards and to work cooperatively to ensure interoperability.

B. P25 Equipment and Devices Offer Public Safety Users an Effective Interoperability Solution.

The national, voluntary P25 consensus standards provide interoperability solutions for mission critical voice and low speed data communications across multiple bands, including VHF, UHF, and 700/800 MHz.¹³ As TIA explains, P25 standards “ensure that any manufacturer’s compliant subscriber radio has access” to “backward compatibility and interoperability with

¹² This is strictly a user-driven committee, with no representatives from the vendor community.

¹³ P25 standards continue to evolve as new technological innovations become available, based on TIA engineering committee work and the P25 standards TIA ultimately publishes.

other systems across system boundaries, regardless of system infrastructure.”¹⁴ In addition, the P25 standards provide an “open interface to the radio frequency subsystem to facilitate interlinking of different vendors’ systems.”¹⁵ P25 standards also facilitate future interoperability by enabling public safety users to migrate while re-using existing spectrum with growth to new compatible bands.¹⁶

The baseline conventional and trunking P25 standards were completed in Phase 1 in 2001. Work on the standards has continued under the name Phase 2, with the most recent additions being the Phase 2 TDMA Common Air Interface (“CAI”) and the Inter-RF Subsystem Interface (“ISSI”).¹⁷ The P25 CAI standard specifies the type and content of signals transmitted by compliant radios. One radio using the P25 CAI is able to communicate with other P25 CAI radios, *regardless of manufacturer*. The CAI is the most widely deployed P25 interface in the suite of standards. It is available as Phase 1 FDMA protocol and will soon be extended to Phase 2 TDMA protocol. The P25 Phase 2 TDMA standardized interface will meet the Commission’s regulatory requirements for 6.25 kHz spectrum efficiency in the VHF, UHF and 700 MHz band

¹⁴ See “Public Safety Radio Communications: The Wireless Industry to the Rescue,” Telecommunications Industry Association, http://www.tiaonline.org/standards/technology/project_25/.

¹⁵ See *id.*

¹⁶ P25 also allows for customized implementations, such as cross-band repeaters and site steering, to satisfy the unique requirements of individual public safety agencies and users. The standards also apply to conventional and trunking architectures, as well as voting receiver and simulcast subsystems. With respect to coverage, P25 standards provide digital coverage equal to or better than analog systems, and same or better coverage from existing analog sites.

¹⁷ Motorola White Paper at 3. These are the key elements needed for interoperability.

plans.¹⁸ Further, the TDMA standard adds a Phase 2 TDMA voice service to the existing Phase 1 FDMA trunked voice and packet data services.

The P25 ISSI is a wireline, network IP-based solution that builds upon today's P25 CAI. A key advantage of ISSI is that P25 systems with different vendor configurations, different system IDs, different user databases, and different RF bands can be interconnected at the network layer. As such, ISSI establishes long-term interoperability options with neighboring networks, regardless of how they evolve and change, while also maintaining autonomy and control. ISSI allows public safety agencies to utilize the coverage areas of existing connected networks, which might span thousands of square miles. And while roaming on connected networks, ISSI enables a user to communicate with their home users and home dispatcher. Wireline solutions also keep the traffic digitally vocoded and encrypted for greater performance and security.

The standardized CAI and ISSI interfaces – like the P25 standards generally – are a great boon to public safety interoperability and vendor competition. As detailed below, the public safety community has recognized the value of P25 equipment and has widely adopted it to meet their interoperable communications needs. The availability of P25 standards and the significant demand for P25 compliant equipment has driven significant competition and the emergence of new market entrants.

¹⁸ P25 Phase II implementation involves time and frequency modulation schemes – TDMA and FDMA – with the goal of improved spectrum utilization. Significant attention is also paid to interoperability with legacy equipment, interfacing between repeaters and other subsystems, roaming capacity and spectral efficiency/channel reuse. In addition, Phase II work involves console interfacing between repeaters and other subsystems, and man-machine interfaces for console operators, which would facilitate centralized training, equipment transitions, and personnel movement.

C. P25 Standards Drive Competition in the Public Safety Equipment Marketplace.

Numerous vendors compete aggressively in the public safety equipment marketplace – competition that P25 standards have fostered. In keeping with its commitment to the public safety community, Motorola was an early leader in the development of the standard and compatible P25 equipment.¹⁹ But Motorola is only one of many manufacturers that offer P25 equipment to the public safety community. There are over thirty Project 25 equipment manufacturers and providers offering a wide array of P25 equipment and services, including stations, repeaters, mobiles, portables, consoles, software, test equipment, system integration services, and consultant services.²⁰ A 2010 report to APCO identified ten stations/repeaters vendors, thirteen mobile vendors,²¹ twelve portable vendors, seven console vendors, seven

¹⁹ Since the 1990s, Motorola has invested in Project 25, developing the ASTRO® 25 portfolio of networks, devices, applications, and services. With over 200 ASTRO 25 systems deployed worldwide, Motorola is committed to the standard and supports thousands of public safety agencies as they meet their interoperability requirements. Further, Motorola continues to promote interoperability by participating in and offering informal and formal interoperability testing opportunities. In January 2009, prior to the Department of Homeland Security lab recognition, Motorola led the industry with a multi-vendor interoperability event to provide agencies documented proof of interoperability. In July 2009, after DHS lab recognition, Motorola performed multi-vendor interoperability testing as part of the P25 Compliance Assessment Program (CAP). Motorola licenses its P25 essential patents for no fees.

²⁰ “Project 25 Equipment Manufacturers – Prepared for APCO 2010,” Project 25 Technology Interest Group, http://www.project25.org/images/stories/ptig/docs/P25_PTIG_Equipment_Mfrs_2010-August.pdf.

²¹ In contrast, Phone Scoop lists 44 separate commercial handset manufacturers, or about three-and-a-half times as many P25 manufacturers. See <http://www.phonescoop.com/phones/>. This ratio is remarkably small, considering that the ratio of potential public safety customers to commercial customers in America is approximately one to one hundred. See *infra* Section III.

network vendors, three P25 software vendors, five test equipment vendors, twelve systems integration vendors, and eight companies offering P25 consultant services.²²

Public safety equipment manufacturers have widely embraced the P25 standards and touted the importance of the standards for fostering competition and interoperability. Harris Corporation, a major P25 equipment supplier, explains that by “supporting the P25 CAI and ISSI, Harris’ P25IP system supports competitive procurements.”²³ Harris also points out that “[r]adios equipped with the P25 CAI can operate on P25-compliant systems from multiple manufacturers providing users with the freedom to choose between different manufacturers’ equipment.”²⁴ Similarly, EADS explains that P25 standards “remove traditional proprietary boundaries, freeing Public Safety Agencies to choose components from different vendors and technologies.”²⁵ According to Midland, “P25 systems can be maintained and upgraded cost effectively over the system’s life cycle, thus ... fostering competition and achieving cost-

²² “Project 25 Equipment Manufacturers – Prepared for APCO 2010,” Project 25 Technology Interest Group, http://www.project25.org/images/stories/ptig/docs/P25_PTIG_Equipment_Mfrs_2010-August.pdf. Manufacturers who advertise availability of P25 infrastructure include Harris Corporation, EF Johnson, EADS, TAIT, Midland, Icom America Inc., and Kenwood Manufacturers. Manufacturers who advertise availability of P25 subscriber radios include EF Johnson Technologies, Harris Corporation, Icom, Kenwood, PowerTrunk, RELM Wireless, Tait Radio Communications, Technisonic, Thales, Wulfsberg, Datron, Vertex, and Midland.

²³ “P25,” Harris, http://www.pspc.harris.com/media/7603D%20-%20P25IP-Sales-Sheet-8.5x11_tcm27-11003.pdf.

²⁴ *Id.* EF Johnson notes that it was “one of the first companies to be fully compliant with the Project 25 interoperability standard, and remain[s] a leader in the ongoing evolution of the P25 suite of standards.” “P25 Interoperable LMR,” EF Johnson Technologies, https://www.efjohnson.com/applications/p25_interoperable. EF Johnson also explains that the P25 ISSI interface “is a significant milestone in wireline interoperability,” which “will enable two or more disparate, trunked, P25 networks to be connected at the network layer.” *Id.*

²⁵ “Land Mobile Radio,” PlantCML® - EADS North America, <http://www.plantcml-eads.com/solutions-products/public-safety/land-mobile-radio>.

effective emergency/safety communications solutions.”²⁶ Icom points to the “benefits of P25,” which “[e]nsure competition in system life cycle procurements so agencies can choose from multiple vendors and products, ultimately saving money and gaining the freedom to select from the widest range of equipment and features.”²⁷ Icom also emphasizes that P25 is “a user-driven standard, it is not an industry – or Federal government – driven standard.”²⁸ Daniels touts “multiple vendors” as one of the major benefits of P25, explaining that the “P25 open standard will allow competing products from multiple vendors to be interoperable. This will allow customers of the P25 product to benefit from multiple manufacturing sources (decreased costs, open bidding, non-proprietary systems).”²⁹ Given that equipment manufacturers have enthusiastically embraced the P25 interoperability standards, when an agency releases an RFP for interoperable equipment, manufacturers must compete by offering lower prices and advanced equipment functionality.

That public safety agencies may decide to utilize Motorola or other experienced manufacturers, notwithstanding the availability of other competitive alternatives, is not evidence of a market failure or a problem with interoperability. Public safety is a demanding market, which is not surprising, given the mission critical nature of communications upon which law enforcement, firefighters, and other emergency personnel rely for their own safety and the safety

²⁶ “About P25,” Midland Radio Corporation, <http://midlandradio.com/Products/About-P25>.

²⁷ “What Is P25?,” Icom America Inc., at 7, http://www.icomamerica.com/en/landmobile/p25info/What_is_P25_Summary.pdf.

²⁸ “What Are Some of the Hallmarks of P25 Technology?,” Icom America Inc, <http://www.icomamerica.com/en/products/landmobile/p25/p25/default.aspx>.

²⁹ “P25 Radio Systems: Training Guide,” Daniels Electronics, Ltd., at 9, <http://www.p25.com/resources/P25TrainingGuide.pdf>.

of the public they protect. Equipment design, system engineering, deployment, and ongoing maintenance are all critical factors in providing suitable solutions for public safety agencies. Motorola has made public safety communications a business priority for over 70 years. Public safety agencies select Motorola solutions, including its P25 equipment, based on its competitive pricing and superior product line, which are backed by the Company's commitment to, knowledge of, and dedication to meeting public safety needs. Motorola takes great pride in the relationship that it has forged with public safety and its role as a partner providing emergency responders with the tools necessary to protect the public. Motorola makes no apologies for the success it has achieved in this market.

III. THE LEVEL OF COMPETITION IN THE PUBLIC SAFETY EQUIPMENT MARKETPLACE IS NOT A CAUSE OF INTEROPERABILITY PROBLEMS.

The Public Notice asserts that the “[n]ation’s first responders rely on communications systems supplied by a small number of equipment providers to support mission-critical communications,” and asks questions that suggest additional competition would in some way lead to greater interoperability.³⁰ As explained above, there already is significant competition, with more than thirty equipment manufacturers and providers competing in the marketplace and offering public safety a wide array of interoperable P25 equipment and services.³¹ Thus, it is simply not the case that there are a “small number of equipment providers” from which public safety officials can choose to meet their communications needs. Moreover, there is no basis to

³⁰ Public Notice at 1. For example, question 2 asks: “How would additional competition...improve narrowband or broadband interoperability?” *Id.*

³¹ “Project 25 Equipment Manufacturers – Prepared for APCO 2010,” Project 25 Technology Interest Group, http://www.project25.org/images/stories/ptig/docs/P25_PTIG_Equipment_Mfrs_2010-August.pdf.

infer that substantially increasing the number of suppliers somehow would make systems and products more interoperable.

Comparisons between the public safety equipment marketplace and the commercial equipment marketplace are misguided.³² Such comparisons ignore the significant difference in sales volume between the public safety users and the commercial/consumer users. The public safety customer total in the United States includes approximately three million first responders, including law enforcement officers, firefighters (both volunteer and paid), and emergency medical personnel. In contrast, the commercial market consists of approximately 300 million potential customers. Thus, the number of potential customers is approximately one to one hundred.

In addition, public safety agencies' operational requirements are not consistent across the country. While interoperability has improved dramatically, operability requirements – which are a key to public safety users – continue to vary across different types of agencies and different size agencies. Thus, in the public safety marketplace, equipment manufacturers must necessarily offer greater customization to meet the unique operational requirements of different public safety agencies. By contrast, little customization is required in the consumer market, where equipment manufacturers offer devices that provide similar functionality that does not vary across geographic markets.

³² See Letter from Julius Genachowski, Chairman, Federal Communications Commission to Henry A. Waxman, Chairman, Committee on Energy and Commerce, U.S. House of Representatives (July 20, 2010) (“Genachowski Congressional Letter”).

Equally misguided are comparisons between the cost of mission critical equipment and consumer equipment.³³ Public safety agencies can and do purchase consumer grade equipment and devices for certain functions. But the public safety community continues to procure mission critical voice systems and equipment because commercial equipment and services do not provide the robust and specialized functionalities required to ensure communications in the harsh operational environment in which first responders routinely work. Redundancy, for example, is a key feature for mission critical voice systems. There must be a high degree of certainty that communications can be completed when individual base sites or the entire network is not available. Accordingly, mission critical voice systems are designed with a series of alternative solutions in case of outages. Public safety systems also generally require hardened base sites to ensure survivability during emergencies. At the cell site, this includes backup generator power, lightning suppression, redundant site links, and secure facilities with controlled access. Typically, these capabilities are provided at all public safety base sites, while not all sites in typical commercial networks are similarly provisioned. At the network operations center, hardening entails backup power, fault tolerant computing platforms, separate backup locations with automatic failover, and secure facilities with controlled access. Further, mission critical applications require ruggedized devices with extended battery life and higher operating powers than consumer devices.³⁴ Commercial devices have no similar requirements.³⁵

³³ *Id.* at 2 (“[T]he staff’s research has found that while a state-of-the-art consumer cellular device typically costs a few hundred dollars, a typical land mobile radio for public safety communications may cost as much as \$5,000.”).

³⁴ Any cost comparisons between land mobile technologies must consider both infrastructure and subscriber device costs. The Commission letter to Congressman Waxman asserted that TETRA technology is less expensive than P25 technologies. Genachowski Congressional Letter at 2. But the Commission’s analysis focused only on handset costs, not the *Footnote continues on next page . . .*

Furthermore, it is not the case, as suggested in the Public Notice, that the state of competition in the public safety equipment marketplace has prevented the Nation from achieving interoperability between public safety systems. Indeed, the public interest would be better served if the Commission focused on improving state and regional governance of interoperability issues and addressed the problems created by the disjointed allocation of public safety spectrum, which are the primary obstacles to achieving the goal of public safety interoperability.

In the 2009 National Governors Association (“NGA”) survey of state homeland security directors, the NGA explained that “the biggest challenge to achieving statewide interoperability is the development of an effective governance structure, which 60 percent of respondents listed as their most significant hurdle.”³⁶ To overcome this hurdle, the Commission should work with states and regions to establish a distinct party responsible for the statewide or regional strategic planning effort to ensure communications interoperability. This entity should be tasked with planning and executing an interoperability strategy that facilitates communications with all levels

costs of additional transmitter sites and infrastructure, such as backhaul, that is needed for equivalent coverage by the lower-powered TETRA infrastructure. Further, comparisons to TETRA fail to recognize that handset costs are also impacted by design requirements. As an example, the North American market has required higher power subscribers to address the larger geographic coverage needed and to better support first responders that must operate in areas without coverage by using unit to unit mode. This extra power directly impacts part costs, cost of design of subscribers to dissipate additional heat, and costs for larger batteries to support this extra power requirement.

³⁵ Public safety users require devices that survive tough conditions and that can be operated during a chaotic emergency. Commercial phones do not provide this functionality. Media reports on the latest generation iPhone, for example, have pointed out the susceptibility of the device’s screen to cracking when dropped. Such fragility is not acceptable for a tool used by first responders. “First Broken iPhone 4 Screen,” Gizmodo, (June 10, 2010), <http://gizmodo.com/5559977/first-broken-iphone-4-shows-new-glass-isnt-that-resistant>.

³⁶ “2009 State Homeland Security Advisors Survey,” National Governors Association Center for Best Practices, at 4 (Feb. 24, 2010), <http://www.nga.org/Files/pdf/1002HSASURVEY.PDF>.

of government: federal, state, local, and tribal. This entity should also serve as a point of contact for other entities when interoperability issues arise during emergencies and in the normal course of emergency operations.

Successful statewide systems have benefited from effective governance structures. For example, Michigan implemented a statewide 800 MHz P25 compliant system for public safety agencies on NPSPAC channels. The system is called the Michigan Public Safety Communications System (“MPSCS”), and it is managed by the Office of Michigan Public Safety Communications System (“Office of MPSCS”) within the Michigan Department of Information Technology. Currently, the MPSCS provides statewide communications to Michigan state government agencies, a number of federal agencies, and a multitude of Michigan county, city, township, and tribal public safety agencies. In 2009, the system supported more than 50,000 active users, representing a broad cross-section of over 1,200 federal, state, and local public safety agencies. In the MPSCS alone, public safety users rely on multiple vendors for their radios, including three mobile manufacturers and five portable manufacturers.³⁷ Additional agencies continue to join the system, and expansion of the system to provide improved service to users is an ongoing effort. In large part, the success of the MPSCS has been driven because of effective governance and the hard work of the Office of MPSCS.

The Commission also must develop strategies to ensure the efficient allocation of spectrum to support public safety communications. In allocating spectrum over the decades, the Commission has tried to address current needs but has not adequately accounted for future growth and increased requirements for public safety communications. Repeatedly, spectrum decision-makers have minimized the amount of spectrum provided. Even with advances in

³⁷ MPSCS Bulletin #2010-02, “Radios Approved for use on the MPSCS” (July 29, 2010).

technology, these small slivers of public safety spectrum that exist in different bands have often become saturated, and public safety has been forced to request another spectrum allocation. When the Commission has allocated spectrum to public safety, the spectrum was sourced from a different band, establishing the incremental patchwork environment that has caused many of the interoperability problems in today's public safety voice networks.³⁸ This approach also has driven up network and equipment costs, as public safety has been forced to design networks that are capable of operating over several different bands at the same time.

For future spectrum allocations, Motorola urges the Commission to account for public safety spectrum needs in both the short-term and long-term. The Commission should allocate larger amounts of spectrum in a single band and all at once, rather than smaller allocations across multiple bands every few years. Equipment manufacturers also have a role here. They should continue to develop equipment that takes into account past spectrum allocations. For its part, all new Motorola subscriber models since 2001 that support 800 MHz, also support 700 MHz, even though this extension band was not fully available nationwide until June 2009 when the digital television transition concluded. 700 MHz Project 25 subscriber devices – shipped since 2006 – all have included the additional capability to operate in the 800 MHz band, thereby enabling interoperability across 800 MHz and 700 MHz spectrum resources.

³⁸ The impact on interoperability of insufficient piecemeal spectrum allocations across multiple bands for public safety voice is well-known. In fact, DHS funded the development of a multi-band radio in an effort to address the interoperability problem that multiple piecemeal bands have caused for public safety interoperability. *See* “DHS Announces Sites for Multi-Band Radio Pilot,” Department of Homeland Security (July 1, 2009), http://www.dhs.gov/ynews/releases/pr_1246478388904.shtm. As noted above, multiple manufacturers including Motorola are making multi-band radios available in the market.

IV. THE COMMISSION SHOULD REAFFIRM SUPPORT FOR P25 STANDARDS, WHICH WILL CONTINUE TO LEAD THE WAY TO ACHIEVING THE ULTIMATE GOAL OF NATIONWIDE PUBLIC SAFETY INTEROPERABILITY.

In response to the Commission’s request for comment on the impact on interoperability of the P25 standards as well as “open standards” more broadly, it is important for the Commission to reaffirm the importance of P25 standards. Public safety agencies have widely embraced the P25 standards, which has successfully fostered interoperability in the public safety sector, which in turn has driven competition and significant advances in communications functionality. And while nationwide interoperability has not yet been achieved, it is important for the Commission to recognize the significant success of the P25 standards and the important role these standards will play in any nationwide interoperability solution.

To Motorola’s knowledge, 36 states have deployed statewide P25 networks across the public safety bands. One-hundred-and-sixty-five cities and counties also have deployed P25 networks. In total, nearly 70% of the U.S. population is covered by a P25 public safety network. Federal agencies also rely upon P25 standards. The Commission has adopted P25 as the interoperability standard for public safety narrowband operations in the nationwide narrowband 700 MHz spectrum allocation.³⁹ P25 also has the support of the U.S. Department of Homeland Security (“DHS”). Specifically, the DHS Office of Emergency Communications – in coordination with the Office of Interoperability and Compatibility – developed the annual *SAFECOM Recommended Guidance for Federal Grant Programs*. And the guidance for fiscal year 2010 clearly specifies that “[a]ll new digital voice systems must be compliant with the

³⁹ *The Development of Operational, Technical and Spectrum Requirements for Meeting Federal, State and Local Public Safety Communication Requirements Through the Year 2010*, Fourth Report and Order, 16 FCC Rcd 2020, ¶ 2 (2001).

Project 25 (P25) suite of standards.”⁴⁰ In addition, the P25 standard has been adopted by many industries such as utility, airline, transit, petroleum, and chemical industries that rely on mission critical communications and interoperability with governmental public safety agencies in an emergency.

And recent annual surveys of state homeland security directors by NGA suggest that interoperability will only increase going forward. As the 2009 NGA survey explains, over the last several years “significant funding and other resources” have been dedicated to developing interoperable communication structures in the states.⁴¹ This effort “appears to be paying off, as survey respondents report marked improvements in their statewide communications capabilities.”⁴² In the 2009 survey, 77 percent of respondents reported an improved ability for first responders to communicate during emergencies.⁴³ This continues a positive trend from the 2008 survey, when 78 percent of respondents said they enjoyed better interoperable capabilities than was the case in 2007.⁴⁴

⁴⁰ Office of Emergency Communications, “Fiscal Year 2010 SAFECOM Guidance for Federal Grant Programs,” at 10 (2010), http://www.safecomprogram.gov/NR/rdonlyres/31A870C0-0C9D-4C29-86F8-147D61AF25CF/0/FY_2010_SAFECOM_Recommended_Guidance__111809_Final.pdf. Around the world, government agencies from Australia to Russia to South America have also adopted Project 25 systems for their mission critical communications.

⁴¹ “2009 State Homeland Security Advisors Survey,” National Governors Association Center for Best Practices, at 4 (Feb. 24, 2010), <http://www.nga.org/Files/pdf/1002HSASURVEY.PDF>.

⁴² *Id.*

⁴³ *Id.*

⁴⁴ *Id.*

In practice, the widespread adoption of P25 equipment has proven extremely valuable during actual emergencies. The Minneapolis bridge disaster in 2007 provides one such example. On August 1, 2007, the I-35W Mississippi River bridge collapsed during the evening rush hour killing thirteen people and injuring many more. During the rescue and recovery efforts, the P25 system worked as designed. Multiple agencies had interoperable communications, including the state of Minnesota, city of Minneapolis, and Hennepin County.⁴⁵ The Commission – in its case-study of the tragic bridge collapse – explained that the “successful rescue and recovery efforts were largely the result of a public safety community that anticipated a major disaster” and “[d]eployed an 800 MHz Protocol Project 25 (P25) trunked LMR radio system that was shared across local, county and state agencies.”⁴⁶

Traffic data support the Commission’s conclusions. Normally, traffic in the area consisted of 63,508 Push-to-Talk communications for a total of 321,573 seconds airtime. During rescue and recovery efforts as a result of the Minneapolis bridge disaster, traffic rose to 114,970 Push-to-Talk communications for a total of 641,423 seconds airtime – nearly double the traffic on a normal day. Impressively, only 0.06% of all calls – 67 total – were delayed over 10 seconds. And only two of these calls – or 0.00002% – were from interoperability/critical

⁴⁵ It is worth noting that local commercial networks were blocked at times during the emergency.

⁴⁶ “Emergency Communications During the Minneapolis Bridge Disaster: A Technical Case Study by the Federal Communications Commission’s Public Safety and Homeland Security Bureau’s Communications Systems Analysis Division,” Federal Communications Commission, at 10 (Nov. 13, 2008). Specifically, the State of Minnesota, the City of Minneapolis, and Hennepin County had adopted the Motorola Astro 25, a trunked P25 LMR system for interoperability. *Id.* at 13.

incident talk groups.⁴⁷ P25 equipment proved to be extremely reliable during that crisis, and it is imperative that the Commission continue to embrace P25 standards going forward.

V. THE COMMISSION WILL ENSURE INTEROPERABILITY IN THE 700 MHz BROADBAND PUBLIC SAFETY NETWORK BY ADOPTING LTE AS THE COMMON AIR INTERFACE STANDARD AND BY REALLOCATING THE D BLOCK FOR PUBLIC SAFETY.

Before public safety users begin the transition to broadband technologies, the Commission has an opportunity to ensure greater interoperability from the outset. Specifically, the Commission should: (1) select LTE as the common air interface for all 700 MHz broadband networks; and (2) work with Congress to repurpose the 700 MHz D Block for broadband public safety systems.

A. The Commission Should Require that All Networks Constructed with 700 MHz Public Safety Broadband Spectrum Adopt the LTE Standards.

The public safety community and the commercial wireless industry have uniformly endorsed LTE 4G technology, and the Commission has wisely specified LTE requirements for the 21 conditional waivers granted May 12, 2010.⁴⁸ Motorola urges the Commission to take the next logical step and adopt LTE as the common standard for all 700 MHz public safety broadband networks.⁴⁹ Selecting LTE as a common air interface for all 700 MHz broadband

⁴⁷ See Ex Parte Letter from Steve B. Sharkey, Senior Director, Regulatory and Spectrum Policy, Motorola, Inc., to Marlene H. Dortch, Secretary, FCC, at Attachment (filed Sept. 10, 2009).

⁴⁸ *Requests for Waiver of Various Petitioners to Allow the Establishment of 700 MHz Interoperable Public Safety Wireless Broadband Networks*, Order, PS Docket No. 06-229, FCC 10-79, ¶ 38 (2010) (“We agree that, for these waiver deployments, the most expeditious and reasonable method of ensuring consistency and interoperability at this early stage is to require the use of LTE, and specifically the use of at least 3GPP Standard, Evolved Universal Terrestrial Radio Access, Release 8, and associated Evolved Packet Core.”).

⁴⁹ Motorola wants to impress upon the Commission that the P25 interoperability systems and the LTE systems will not be mutually exclusive. Both types of systems will service distinct purposes. The interoperable P25 networks will continue to provide mission-critical voice
Footnote continues on next page . . .

networks is a prerequisite if the Commission truly wants to facilitate interoperability on a national level. Requiring that public safety broadband networks meet the 3GPP Release 8 LTE standard also will promote competition for public safety equipment by allowing vendors to leverage their commercial LTE developments to offer products that meet the unique needs of public safety.

At the same time, the Commission should avoid heavy-handed regulation, which could cripple the development of new technologies by overly detailed application of regulatory dictates.⁵⁰ While technical standards ensure interoperability and provide manufacturing economies of scale, codification of specific standards into Commission rules may subject technological advancements to lengthy rule making processes.⁵¹ In lieu of Commission approval, the Commission could use the Emergency Response Interoperability Center (“ERIC”) to review new technologies and issue technology recommendations to guide public safety purchase decisions. Motorola believes the Commission should only define the standards necessary to ensure roaming and interoperability. While providing service to roaming public safety responders is key for all networks, each local and regional public safety broadband network will have different challenges and requirements that will demand at least some level of customization. Onerous regulations that embody a one-size-fits-all approve would prevent the flexibility and creativity that may be required to meet public safety needs.

services. While the primary added value of 700 MHz broadband systems will be the capacity for data and video.

⁵⁰ See Comments of Motorola, Inc., PS Docket No. 06-229 (July 19, 2010).

⁵¹ The Commission should attempt to minimize the impact of any future rules on the waiver recipients and other early adopters and avoid regulations that require replacement of initial products and designs.

B. The Commission Should Work with Congress to Reallocate the 700 MHz D Block for Public Safety Broadband Systems.

To provide the best route for an advanced, interoperable, nationwide wireless broadband network, the Commission should support efforts to obtain a reallocation of the D block directly to the public safety community.⁵² Without the D block spectrum, public safety users will have insufficient resources to accomplish their missions during times of emergency and may even be prevented from taking advantage of the full benefits of wireless broadband technologies and applications during their day-to-day use. In turn, public safety agencies would have little choice to rely upon commercial broadband networks, even for day-to-day activities, which are inadequate to meet all the communications needs of first responders. Moreover, reallocation of the D block would help resolve outstanding technical and operational issues previously identified by the Commission, such as those related to roaming, network performance, and interference protection.⁵³

Failure to reallocate the D block for public safety broadband will further perpetuate the problems that have resulted from the allocation of public safety spectrum in a patchwork fashion. As explained above, a major impediment to public safety interoperability has been the failure to provide enough spectrum in a single block for both current and future needs, which have always exceeded expectations. This problem was repeated once again in the National Broadband Plan.

⁵² Even without a formal public/private partnership, public safety will still benefit from commercial advances in the 700 MHz band. LTE will be the dominant commercial platform across the overwhelming majority of the commercial 700 MHz allocation, regardless of a D Block reallocation. From a base transceiver (eNodeB) standpoint, Motorola already sees vendors offering Band Class 14 equipment to the Public Safety Communications Research test bed, so those investments have already been made.

⁵³ See *Public Safety And Homeland Security Bureau Seeks Comment On Interoperability, Out Of Band Emissions, And Equipment Certification For 700 MHz Public Safety Broadband Networks*, Public Notice, 25 FCC Rcd 5486 (2010).

Rather than recommending a spectrum allocation proposal that would serve public safety's long-term needs, the Plan focused on commercial broadband needs, proposing an additional 500 MHz of spectrum. By contrast, in addressing public safety's long-term broadband needs, the Plan recommended that only 10 MHz of spectrum be dedicated to public safety for broadband, even though the public safety community had requested 20 MHz.⁵⁴ In addition, the Plan assumed that data speeds of 256 kbps will be sufficient for the nation's first responders while separately recommending that the general public should have a minimum of 4 Mbps for downlink service and 1 Mbps for uplink service.⁵⁵

Fortunately, the Plan's recommendations are not set in concrete. And the Commission still has time to work with Congress to repurpose the 700 MHz D block for public safety. To this end, Motorola applauds the members of Congress who have taken legislative steps to dedicate the D block for broadband public safety systems. Motorola urges the Commission to support this reallocation and join with the public safety sector in promoting the public interest by repurposing the 700 MHz D block for public safety.

VI. CONCLUSION

For the foregoing reasons, the Commission should reaffirm the importance of the public safety-driven Project 25 standards for interoperable narrowband communications. The Commission also should refocus its attention and resources on resolving problems arising from

⁵⁴ *Omnibus Broadband Initiative, Connecting America: The National Broadband Plan*, at Recommendation 5.8.2. (2010). Securing enough spectrum for public safety broadband communications is vital given the sharp increase that is anticipated in public safety broadband traffic. Public safety operations increasingly require multiagency coordination. Even a fairly routine incident may call in over 100 responders and over 50 vehicles – all requiring coordinated, interoperable communications. More expansive incidents like the 2007 Minneapolis I-35 bridge collapse had over 128 agencies and over 1,200 first responders involved in the rescue operations.

⁵⁵ *Id.* at 135.

ineffective state and regional governance and disjointed spectrum allocations. Finally, the Commission should advocate for the repurposing of the 700 MHz D block for public safety and should adopt LTE as the standard for the 700 MHz public safety broadband network.

Respectfully submitted,

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