

**Before the
Federal Communications Commission
Washington, D.C. 20554**

In the Matter of)	
)	
Review of the Commission’s Rules Governing the 896-901/935-940 MHz Band)	WT Docket No. 17-200
)	
Realignment of the 896-901/935-940 MHz Band to Create a Private Enterprise Broadband Allocation)	RM-11738 (Terminated)
)	
Amendment of the Commission’s Rules to Allow for Specialized Mobile Radio Services Over 900 MHz Business/Industrial Land Transportation Frequencies)	RM-11755 (Terminated)
)	

NOTICE OF INQUIRY

Adopted: August 4, 2017

Released: August 4, 2017

Comment Date: September 18, 2017

Reply Comment Date: October 18, 2017

By the Commission:

I. INTRODUCTION

1. In this *Notice of Inquiry (NOI)*, we begin a proceeding to examine whether any rule changes may be appropriate to increase access to spectrum, improve spectrum efficiency, and expand flexibility in the 896-901/935-940 MHz band (900 MHz band) for next generation technologies and services. This band was designated in 1986 for narrowband private land mobile radio (PLMR) communications by Business/Industrial/Land Transportation (B/ILT) licensees and Specialized Mobile Radio (SMR) providers, with systems in place today. Consistent with our recent efforts to promote flexibility, efficiency, and access in the use of other spectrum bands,¹ we seek comment on the potential for modification to the operational rules and band configuration for the 900 MHz band, which has undergone few changes since 1986, in light of continuing evolutions in technology and the marketplace. In that context, we invite commenters to provide economic and technical data in order to better understand current and future uses and needs in the band.

II. BACKGROUND

A. 900 MHz Band History and Channel Plan

2. The 900 MHz band consists of 399 narrowband (12.5 kilohertz) frequency pairs grouped into 10-channel blocks that alternate between SMR blocks that are geographically licensed by Major

¹ See, e.g., *Review of the Commission’s Part 95 Personal Radio Services Rules; Petition for Rulemaking of Garmin International, Inc.; Petition for Rulemaking of Omnitronics. L.L.C.*, Report and Order, FCC 17-57 (May 19, 2017); *Amendment of Parts 1 and 22 of the Commission’s Rules with Regard to the Cellular Service, Including Changes in Licensing of Unserved Area, et al.*, Second Report and Order, Report and Order, and Second Further Notice of Proposed Rulemaking, 32 FCC Rcd 2518 (2017).

Trading Area (MTA) and B/ILT blocks in which channels are assigned on a site-by-site basis.² SMR service was established by the Commission to provide land mobile communications on a commercial (*i.e.*, for profit) basis,³ while B/ILT radio systems serve a great variety of communications needs to support licensees' day-to-day business operations, safety, and emergency needs, including activities such as dispatching and diverting personnel or work vehicles, coordinating the activities of workers and machines on location, or remotely monitoring and controlling equipment.⁴

3. To address a fast growing need for private internal land mobile service spectrum, the Commission in 1986 divided the 900 MHz band⁵ evenly between the SMR pool and the B/ILT pool.⁶ It adopted a 12.5 kilohertz channeling plan in order to maximize spectrum efficiency so that the greatest number of users could be accommodated.⁷

4. The Commission provided that the B/ILT channels would be assigned on a site-by-site basis with frequency coordination.⁸ After Congress amended the Communications Act of 1934 to reclassify most SMR licensees as commercial mobile radio service (CMRS) providers⁹ and authorize the Commission to employ competitive bidding to select from among mutually exclusive applicants for

² See 47 CFR §§ 90.613, 90.617(c), (f). Mobile and control station frequencies are assigned from the 896-901 MHz band, and are paired with corresponding base station frequencies exactly 39 megahertz higher taken from the 935-940 MHz band. All of the channels are available nationwide, but are subject to additional technical constraints in the United States/Mexico and United States/Canada border regions. See 47 CFR § 90.619(b), (d).

³ *Implementation of Section 6002(B) of the Omnibus Budget Reconciliation Act of 1993*, Sixteenth Report, 28 FCC Rcd 3700, 3773, para. 93 (2013).

⁴ *Replacement of Part 90 by Part 88 to Revise the Private Land Mobile Radio Services and Modify the Policies Governing Them; and Examination of Exclusivity and Frequency Assignments Policies of the Private Land Mobile Services*, Second Report and Order, 12 FCC Rcd 14307, 14328, para. 40 (1997).

⁵ When in 1970 the Commission reduced the allocation for the 890-940 MHz Industrial, Scientific, and Medical Equipment band to 902-928 MHz, it reallocated the remaining spectrum for land mobile radio services and held the spectrum in reserve because it did not expect 900 MHz land mobile equipment to be developed for several years. See *Inquiry Relative to the Future Use of the Frequency Band 806-960 MHz; and Amendment of Parts 2, 18, 21, 73, 74, 89, 92 and 93 of the Rules Relative to Operations in the Land Mobile Service Between 806 and 890 MHz*, First Report and Order and Second Notice of Inquiry, FCC 70-519, 19 Rad. Reg. 2d 1663, 1667, 1669, paras. 13, 18 (1970).

⁶ See *Amendment of Parts 2 and 22 of the Commission's Rules Relative to Cellular Communications Systems, Amendment of Parts 2, 15, and 90 of the Commission's Rules and Regulations to Allocate Frequencies in the 900 Reserve Band for Private Land Mobile Use, Amendment of Parts 2, 22 and 25 of the Commission's Rules to Allocate Spectrum for, and to Establish Other Rules and Policies Pertaining to the Use of Radio Frequencies in a Land Mobile Satellite Service for the Provision of Various Common Carrier Services*, Report and Order, 2 FCC Rcd 1825, 1828, 1831, paras. 27, 50 (1986) (*1986 900 MHz Report and Order*); see also *id.* at 1929, para. 29 (stating that it was "clear that without some action, serious spectrum shortfalls for the private land mobile services would occur in the near future, especially in the nation's major urban centers"). Initially, the Business pool and the Industrial and Land Transportation pool were separate; they were consolidated into the B/ILT pool in 2004. See *Improving Public Safety Communications in the 800 MHz Band, et al.*, Report and Order, Fifth Report and Order, Fourth Memorandum Opinion and Order, and Order, 19 FCC Rcd 14969, 15126, para. 334 (2004) (*800 MHz Report and Order*).

⁷ See *1986 900 MHz Report and Order*, 2 FCC Rcd at 1834, para. 69.

⁸ See *id.* at 1835, paras. 78-80.

⁹ See Omnibus Budget Reconciliation Act of 1993, Pub. L. No. 103-66 (Budget Act), § 4009(a), 107 Stat. 312, 392 (1993) (codified at 47 U.S.C. §§ 309(j) and 332). SMR systems are defined as those "in which licensees provide land mobile communications services (other than radiolocation services) in the 800 MHz and 900 MHz bands on a commercial basis to entities eligible to be licensed under this part, Federal Government entities, and individuals." 47 CFR § 90.7.

certain licensed services,¹⁰ the Commission provided that the SMR channels would be assigned by competitive bidding using MTAs as service areas.¹¹ To prevent SMR encroachment on non-auctionable Private Mobile Radio Service (PMRS) spectrum and preserve a clear demarcation between the two, the Commission prohibited SMR systems from being authorized on B/ILT channels.¹²

5. In 2004, the Commission ordered rebanding of the 806-824/851-869 MHz band (800 MHz band) to resolve interference between commercial systems—primarily SMR systems operated by Nextel Communications, Inc., which subsequently merged with Sprint Corporation to form Sprint Nextel¹³ (referred to herein as Sprint)—and public safety systems in the band.¹⁴ In order to provide regulatory flexibility for Sprint to shift some of its operations to the 900 MHz band to create “green space” to facilitate 800 MHz rebanding, the Commission amended its rules to allow 900 MHz B/ILT licensees to convert their PLMR authorizations to CMRS authorizations or assign their authorizations to others for CMRS use.¹⁵ In response to an exceptionally high number of applications for 900 MHz B/ILT licenses, the Wireless Telecommunications Bureau (Bureau) then imposed a freeze on new 900 MHz B/ILT licenses,¹⁶ which lasted until 2013,¹⁷ to ensure that Sprint had adequate “green space.”

6. In 2005, the Commission proposed to license 900 MHz B/ILT spectrum by geographic area licenses assigned through competitive bidding, and permit any fixed or mobile service.¹⁸ In 2008, the Commission rejected this proposal and decided to retain site-based licensing and continue to reserve these channels for B/ILT eligibles in order to accommodate current and future “traditional B/ILT”

¹⁰ See Budget Act § 4008.

¹¹ See *Implementation of Sections 3(n) and 332 of the Communications Act - Regulatory Treatment of Mobile Services*, Third Report and Order, 9 FCC Rcd 7988, 8022, para. 116 (1994).

¹² See *Amendment of Part 90 of the Commission's Rules to Facilitate Future Development of SMR Systems in the 800 MHz Band*, First Report and Order, Eighth Report and Order, and Second Further Notice of Proposed Rule Making, 11 FCC Rcd 1463, 1537, para. 141 (1995); 47 CFR § 90.617(c); see also 47 CFR § 90.179(e) (permitting for-profit sharing above 800 MHz only by SMR, Private Carrier Paging, Location and Monitoring Service, and Dedicated Short-Range Communications Service licensees).

¹³ *Improving Public Safety Communications in the 800 MHz Band et al.*, Memorandum Opinion and Order, 20 FCC Rcd 16015, 16051, para. 80 (2005).

¹⁴ See *800 MHz Report and Order*, 19 FCC Rcd at 14970, para. 2.

¹⁵ See *id.* at 15127-28, paras. 335-37; see also 47 CFR § 90.621(f). In the succeeding years, Sprint acquired large numbers of site-based B/ILT and geographic SMR 900 MHz licenses. See *Amendment of Part 90 of the Commission's Rules to Provide for Flexible Use of the 896-901 MHz and 935-940 MHz Band Allotted to the Business and Industrial Land Transportation Pool*, Report and Order, 23 FCC Rcd 15856, 15865, para. 14 (2008) (*2008 900 MHz Report and Order*).

¹⁶ See *Wireless Telecommunications Bureau Freezes Applications in the 900 MHz Band*, Public Notice, 19 FCC Rcd 18277, 18277-78 (WTB 2004).

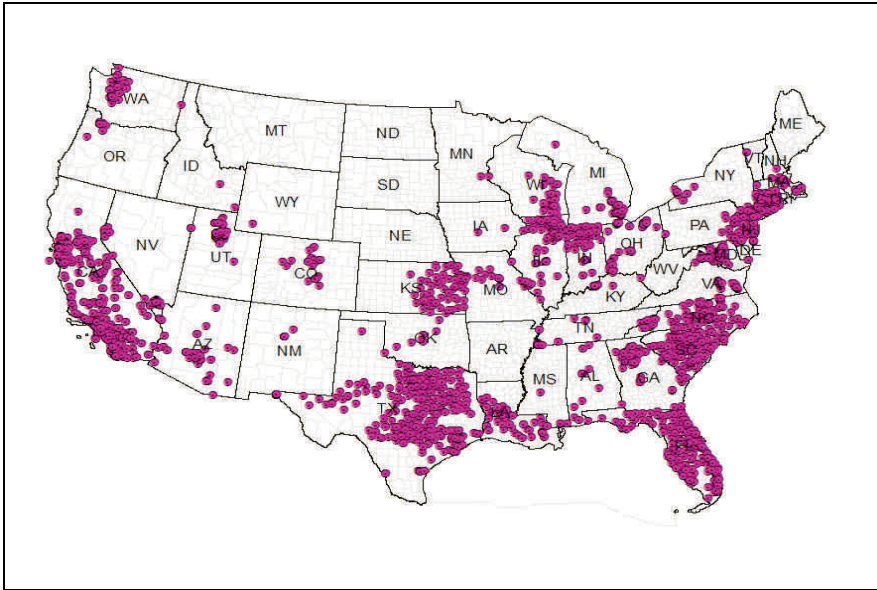
¹⁷ In 2008, the Commission ordered that the freeze would be lifted in each National Public Safety Planning Advisory Committee (NPSPAC) region six months after the completion of rebanding. See *2008 900 MHz Report and Order*, 23 FCC Rcd at 15872, paras. 27-29. The Commission subsequently began allowing qualified applicants to obtain new service authorizations with Sprint's concurrence in regions where rebanding was incomplete, and Sprint filed a general letter of concurrence in 2013, so applications for 900 MHz B/ILT licenses are now accepted in any NPSPAC region. See *Commission Modifies Freeze on Applications in the 900 MHz Band*, Public Notice, 28 FCC Rcd 13165, 13166 (WTB 2013) (*900 MHz Freeze Public Notice*).

¹⁸ See *Amendment of Part 90 of the Commission's Rules to Provide for Flexible Use of the 896-901 MHz and 935-940 MHz Band Allotted to the Business and Industrial Land Transportation Pool*, Notice of Proposed Rulemaking and Memorandum Opinion and Order, 20 FCC Rcd 3814, 3819-20, paras. 12-14 (2005) (*900 MHz NPRM*).

operations, *i.e.*, eligible licensees controlling and operating their own systems to address their own private, internal communications needs.¹⁹

B. 900 MHz B/ILT Users' Current and Future Needs

7. A recent review of the Commission's Universal Licensing System database shows approximately 2700 900 MHz B/ILT sites (*i.e.*, facilities operating on B/ILT channels that have not been converted to SMR use) licensed to approximately 500 licensees. The distribution of B/ILT sites across the United States is shown on the map below. While the service is used throughout the country, the greatest number of stations are in the coastal Northeast, the Carolinas, the Atlanta region, Florida, the Great Lakes region, the Gulf Coast area, coastal Washington State, and throughout California.



8. Examples of 900 MHz B/ILT licensees include entities engaged in land transportation, utilities, manufacturers, and the petrochemical industry.²⁰ Commenters state that their 900 MHz facilities are essential not only for performing day-to-day business operations, but also play a critical role in ensuring fast and reliable communication with local, state, and federal response teams during emergencies.²¹

9. In response to the Commission seeking comment on one of the petitions detailed below, electric, gas, and water utilities state that they use 900 MHz land mobile radio systems for voice communications in daily operations and during emergencies, including disaster recovery.²² It is used at

¹⁹ See *2008 900 MHz Report and Order*, 23 FCC Rcd at 15863-64, paras. 12-13; see also *id.* at 15863, para. 12 (noting that “the dedicated spectrum allotted to B/ILT licensees at 900 MHz represents one of the few remaining opportunities for such licensees to obtain much-needed spectrum,” and that the transition to geographic licensing “could in many cases frustrate beneficial system growth”).

²⁰ *Id.* at 15858, para. 2.

²¹ See, e.g., Ad Hoc Refiners Group [Exxon Mobil Corporation, Marathon Petroleum Corporation, and Phillips 66] Jan. 27, 2015 Comments, RM-11738, at 4.

²² See, e.g., Lower Colorado River Authority (LCRA) Jan. 12, 2015 Comments, RM-11738, at 3-4 (LCRA Jan. 12, 2015 Comments); NextEra Energy, Inc. (NextEra) Jan. 12, 2015 Comments, RM-11738, at 5 (NextEra Jan. 12, 2015 Comments).

nuclear power plants for security operations, public alert notifications, and other purposes.²³ Other reported uses include flood warning systems;²⁴ and Smart Grid²⁵ applications including advanced metering infrastructure,²⁶ and transmission and distribution functions such as transmission line monitoring, distribution feeder automation, and supervisory control and data acquisition (SCADA) to support, monitor, control, and secure the grid's infrastructure.²⁷ Utilities assert these systems require low latency (under 20 milliseconds) and ultra-high reliability (99.9999%), and must serve rural and suburban communities as well as more populated areas, so utilities must rely on private internal communications systems rather than commercial networks.²⁸

10. Companies involved in the petroleum and natural gas industries state that they also rely on 900 MHz systems, principally in refineries and chemical manufacturing plants.²⁹ Their two-way communication systems and SCADA systems support operational, security, maintenance, and safety-related functions.³⁰ They assert that robust communications are essential for the health and safety of their workers and the surrounding communities.³¹

11. According to B/ILT entities, their need for narrowband spectrum to support voice for dispatch and other applications will continue, due to their own business growth, as well as the deployment of new and better communications technologies. Because some of their communication systems are increasingly being used for machine-to-machine communications, including Smart Grid,³² B/ILT entities will also require increased access to data services.

C. Pending Proposals

12. *EWA/PDV Petition.* The Enterprise Wireless Alliance (EWA)³³ and Pacific DataVision, Inc. (PDV)³⁴ (collectively EWA/PDV) jointly filed a Petition for Rulemaking (EWA/PDV Petition)³⁵

²³ Letter from Bryan N. Tramont, Counsel, NextEra Energy, Inc., to Marlene H. Dortch, Secretary, FCC RM-11738, at 5 (filed Apr. 29, 2016).

²⁴ See LCRA Jan. 12, 2015 Comments at 4.

²⁵ The National Institute of Standards and Technology defines the Smart Grid as the “two-way flow of electricity and information to create an automated, widely distributed energy delivery network.” See Smart Grid: A Beginner's Guide, <http://www.nist.gov/smartgrid/beginnersguide.cfm> (last visited May 10, 2017).

²⁶ See, e.g., Westar Energy, Inc. Comments, RM-11738, at 2-3.

²⁷ See, e.g., Oncor Electric Delivery Company LLC Comments, RM-11738, at 4.

²⁸ See Utilities Telecom Council (UTC) Jan. 12, 2015 Comments at 4-6; UTC March 11, 2011 Comments at 12; NextEra Jan. 12, 2015 Comments at 6.

²⁹ See American Petroleum Institute (API) Jan. 12, 2015 Comments, RM-11738, at 2-3.

³⁰ See *id.*

³¹ See E. I. Du Pont de Nemours and Company Jan. 12, 2015 Comments, RM-11738, at 2.

³² See FCC, Connecting America: The National Broadband Plan at 249 (2010), <https://www.fcc.gov/general/national-broadband-plan>.

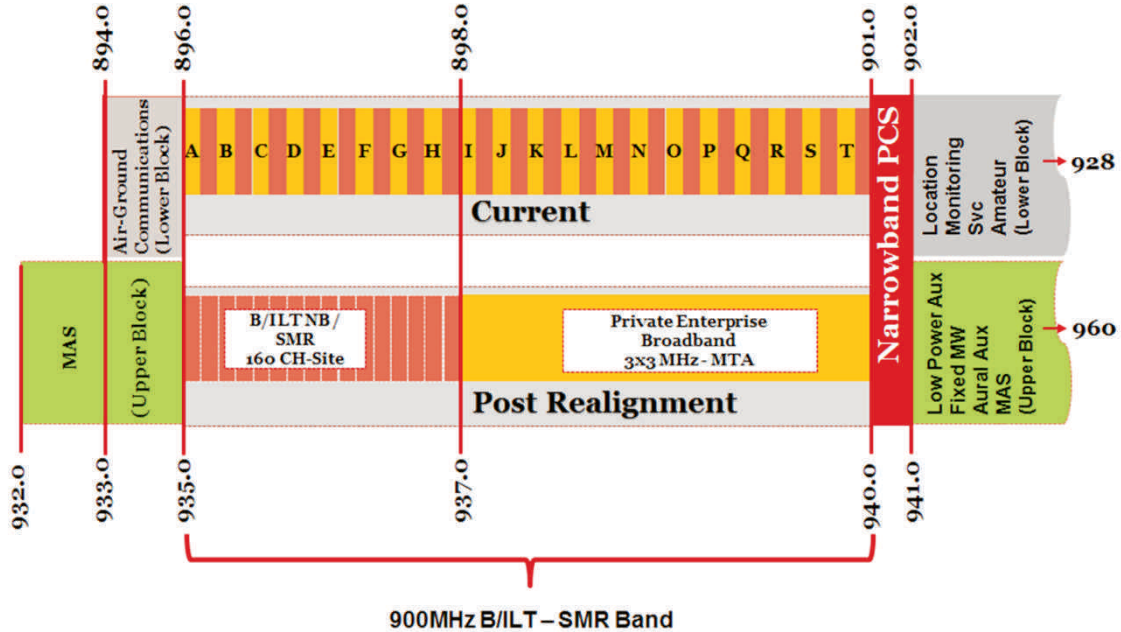
³³ EWA, a Part 90 PLMR frequency coordinator experienced in the coordination of 900 MHz and other PLMR channels, is an organization that represents many 900 MHz band licensees. See EWA/PDV Petition at 12.

³⁴ PDV states that it is the largest holder of 900 MHz spectrum nationwide, with an average of 240 (non-contiguous) channels in the top 20 markets. See *id.* at 3, 5, 11, 13. Most of its spectrum was acquired from Sprint. See *id.* at 3-4.

³⁵ Petition for Rulemaking of the Enterprise Wireless Alliance and Pacific DataVision, Inc., RM-11738 (filed Nov. 17, 2014), <http://appsint.fcc.gov/ecfs/document/view?id=60001008215> (EWA/PDV Petition). EWA/PDV subsequently filed a Supplement containing draft proposed rules. *Ex Parte* Comments, Proposed 900 MHz PEBB Allocation Rules (filed May 3, 2015), <http://appsint.fcc.gov/ecfs/document/view?id=60001011470> (EWA/PDV

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requesting that the Commission open a rulemaking proceeding to realign the 900 MHz band into a 3/3 megahertz broadband segment (898-901/937-940 MHz) and a 2/2 megahertz narrowband segment (896-898/935-937 MHz), as follows:



EWA/PDV propose that a single licensee in each MTA be assigned the Private Enterprise Broadband (PEBB) license for the broadband segment;³⁶ while the narrowband segment would continue to be used for site-based B/ILT and MTA SMR narrowband operations, with current B/ILT and SMR licensees below 898/937 MHz retaining their current assignments.³⁷ Some commenters suggest that existing secondary market mechanisms are adequate for PDV to aggregate a 3/3 megahertz block without a Commission-mandated realignment process,³⁸ but EWA/PDV disagree.³⁹

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 Supplement). The Bureau sought comment on the EWA/PDV Petition and on the Supplement. *See Wireless Telecommunications Bureau Seeks Comment on Enterprise Wireless Alliance and Pacific DataVision, Inc. Petition for Rulemaking Regarding Realignment of 900 MHz Spectrum*, Public Notice, 29 FCC Rcd 14424 (WTB MD 2014); *Wireless Telecommunications Bureau Seeks Comment on Supplement to Enterprise Wireless Alliance and Pacific DataVision, Inc. Petition for Rulemaking Regarding Realignment of 900 MHz Spectrum*, Public Notice, 30 FCC Rcd 4763 (WTB MD 2015).

³⁶ See EWA/PDV Petition at ii, 3, 14-15. EWA/PDV propose that the PEBB license be assigned to the licensee that currently holds at least 15 of the 20 geographic SMR licenses. Based on this selection criterion, in most MTAs the PEBB licensee would be PDV. *See id.* at 17. In the MTAs where no licensee holds at least 15 SMR licenses, EWA/PDV propose that all MTA licensees be required to negotiate to select the PEBB licensee, with no PEBB license issued (and the current band plan retained) unless an agreement is reached. *See id.*

³⁷ *See id.* at ii, 17.

³⁸ See, e.g., Duke Energy Corporation (Duke Energy) June 29, 2015 Comments, RM-11738, at 5 (Duke Energy June 29, 2015 Comments); Salt River Project June 29, 2015 Comments, RM-11738, at 8 (Salt River Project June 29, 2015 Comments); UTC June 29, 2015 Comments, RM-11738, at 5 (UTC June 29, 2015 Comments).

³⁹ See EWA/PDV Jan. 12, 2015 Comments, RM-11738, at 12-13.

13. The PEBB licensee would be required to fund the relocation of current B/ILT and SMR licensees above 898/937 MHz—who would not be permitted to continue operating in the broadband segment—to comparable facilities in the narrowband segment.⁴⁰ After relocation and band realignment, the PEBB licensee would be required to “offer a build-to-suit broadband solution”⁴¹ to any requesting B/ILT entity, with mandatory priority access for critical infrastructure industry (CII) entities.⁴² EWA/PDV assert that realignment of the 900 MHz band is in the public interest because it will provide broadband capabilities to commercial users, particularly CII entities, whose needs are not met by existing commercial broadband networks.⁴³

14. PLMR interests question whether the promised benefits would be worth the disruption and potential interference, and assert that EWA/PDV have not demonstrated that the proposal will actually meet the operational needs of CII licensees that the proposal purports to serve.⁴⁴ Some commenters express doubt as to whether the 896-898/935-937 MHz segment will accommodate all the licensees that need to be relocated from the 898-901/937-940 MHz segment,⁴⁵ and note that there will be little or no spectrum available for them to expand their operations even if existing incumbents can be accommodated.⁴⁶ Some also assert that EWA/PDV’s proposed technical standards⁴⁷ provide insufficient interference protection to operations outside the broadband segment.⁴⁸

15. *M2M Petition.* M2M Spectrum Networks, LLC (M2M)⁴⁹ filed a Petition for Rulemaking requesting that the Commission amend the rules to permit SMR systems on 900 MHz B/ILT channels, provided that the end-users are B/ILT-eligible.⁵⁰ M2M states that many 900 MHz licensees do not have

⁴⁰ See EWA/PDV Petition at 16. The relocation to comparable facilities would mean that a relocating licensee would experience no reduction in system capacity, coverage, or signal strength within the licensee’s coverage area. *See id.* SMR licensees could choose instead to negotiate with the PEBB licensee concerning the contribution of their spectrum rights to the PEBB license. *See id.*

⁴¹ See EWA/PDV Petition at iii; *see also* EWA/PDV Supplement at 12 (“the PEBB licensee shall engage in good faith negotiations with such PE/CII entity for a contract that will provide for the construction and operation of PEBB broadband system in the Private Enterprise Broadband allocation within the coverage area requested by the PE/CII entity”).

⁴² See *generally* Letter from Elizabeth R. Sachs, Counsel, Enterprise Wireless Alliance and Pacific DataVision, Inc., to Marlene Dortch, Secretary, FCC, RM-11738 (filed Dec. 30, 2014).

⁴³ See EWA/PDV Petition at ii-iii.

⁴⁴ See, e.g., Duke Energy June 29, 2015 Comments at 5; Salt River Project June 29, 2015 Comments at 8; UTC June 29, 2015 Comments at 5.

⁴⁵ See, e.g., Eversource Energy June 29, 2015 Comments, RM-11738, at 1; LCRA Jan. 12, 2015 Comments at 5; LCRA June 29, 2015 Comments at 1. EWA/PDV concede that the 896-898/935-937 MHz segment might not accommodate all the licensees that need to be relocated in all markets, and relocation will likely need to be supplemented with license acquisition by the PEBB licensee and contribution from incumbent SMR licensees. *See* EWA/PDV July 14, 2015 Comments at 12.

⁴⁶ See LCRA Jan. 12, 2015 Comments at 5; LCRA June 29, 2015 Comments at 1; NextEra Jan. 12, 2015 Comments at 11.

⁴⁷ See EWA/PDV Supplement, Proposed Rules at 13; EWA/PDV March 25, 2015 *Ex Parte* Letter, Attach. at 12; EWA/PDV July 14, 2015 Comments at 10; EWA/PDV July 14, 2015 Comments at 10-11.

⁴⁸ See, e.g., Duke Energy June 29, 2015 Comments at 3-4; NextEra June 29, 2015 Comments, RM-11738, at 5.

⁴⁹ M2M intends to build a network using 900 MHz B/ILT channels to provide communications services to businesses for their private, internal machine-to-machine communications needs. *See Spectrum Networks Group, LLC*, Order, 30 FCC Rcd 3509, 3511, para. 3 (WTB MD 2015), *review pending*.

⁵⁰ Petition for Rulemaking of M2M Spectrum Networks, LLC, RM-11755 (filed June 29, 2015), <http://appsint.fcc.gov/ecfs/document/view?id=60001108411> (M2M Petition). The Bureau sought comment on

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significant broadband needs and instead rely heavily on the availability of narrowband channels.⁵¹ It argues that its proposed amendment would be consistent with the Commission's intent to increase operational flexibility in the 900 MHz band, and thereby allow businesses to better fulfill their communication needs.⁵²

16. Most commenters oppose the M2M proposal due to concerns that it would have a serious negative effect on the availability of 900 MHz B/ILT spectrum for traditional B/ILT users, thereby impeding the ability of such users to expand capacity and coverage of their own private internal systems.⁵³ Other parties argue that the proposal will create more short-spacing situations in urban areas, and force B/ILT users instead to purchase access to spectrum in this band from commercial SMRs like M2M at a premium price.⁵⁴

III. DISCUSSION

17. In this *NOI*, we broadly seek comment on whether the public interest would be served by making changes to the existing regime in the 900 MHz band. We invite commenters to address factors that would affect this public interest determination, including, but not limited to, whether any changes to improve the technical and operational flexibility and efficiency of the 900 MHz band are appropriate; 900 MHz band users' current and future needs; whether those needs would be adequately fulfilled by alternate spectrum bands that have been allocated to or will be available to B/ILT users; and the financial and non-financial impacts of any changes on existing users' operations. We specifically invite affected entities to provide up-to-date information, including economic data, to supplement the overview of the needs of various groups of B/ILT 900 MHz band users.

18. More generally, we seek comment on how to ensure that the 900 MHz band is put to its best and highest use for the American public. Commenters should discuss current and future needs, narrowband or broadband, of existing or new potential users and suggest how these needs can be met within the 900 MHz band. We seek additional comment on various specific options for the future use of the 900 MHz band that have been proposed in the records of the rulemaking petitions, but also invite commenters to present alternative approaches, including the costs and benefits of such options. We hope to develop a comprehensive record on which the Commission may, if the record warrants, propose further action to ensure that the 900 MHz band is an efficiently managed resource that meets current and future users' needs.⁵⁵

A. Retaining the Existing Band Configuration but Increasing Operational Flexibility

19. As discussed above, only B/ILT eligibles currently may apply for 900 MHz B/ILT channels, but they are permitted to convert their PLMR authorizations to CMRS authorizations and to

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M2M's petition. *Wireless Telecommunications Bureau Seeks Comment on M2M Spectrum Networks Petition for Rulemaking to Allow Specialized Mobile Radio Services Over 900 MHz Business/Industrial Land Transportation Frequencies*, Public Notice, 30 FCC Rcd 8468 (WTB MD 2015).

⁵¹ See M2M Petition at 5-6.

⁵² See *id.* at 2-3 (citing *800 MHz Report and Order*, 19 FCC Rcd at 15127, paras. 335-37).

⁵³ See API Sept. 21, 2015 Comments, RM-11755, at 4 (API Sept. 21, 2015 Comments); FirstEnergy Crop. Comments, RM-11755, at 4 (FirstEnergy Comments); LCRA Comments, RM-11755, at 2-5; UTC Sept. 21, 2015 Comments, RM-11755, at 3 (UTC Sept. 21, 2015 Comments); Alarm Industry Communications Committee Comments, RM-11755, at 3 (AICC Comments).

⁵⁴ See API Sept. 21, 2015 Comments at 4; FirstEnergy Comments at 4-5; AICC Comments at 2; UTC Sept. 21, 2015 Comments 3-4; LCRA Comments, RM-11755, at 2-5.

⁵⁵ We note that EWA/PDV Petition and M2M Petition discussed above present competing proposals about how to organize the 900 MHz band. We deny these petitions for rulemakings in light of our decision to start a comprehensive examination of the 900 MHz band in this *Notice of Inquiry*.

assign their authorization to SMR entities for commercial use. We seek comment on whether or not to revise our rules to increase operational flexibility of licensees in the 900 MHz band operating on B/ILT channels, while keeping the same band configuration. We ask that commenters discuss and quantify the costs and benefits of such potential changes.

20. What rule changes would be appropriate to help promote this type of flexibility? Should we permit expanded opportunities for commercial providers to offer service to B/ILT users on B/ILT spectrum? Should we consider broader flexibility, such as making the current B/ILT channels available for site-based B/ILT or SMR use without the current eligibility requirement?

21. What new services could become available if commercial use in this band is expanded? In particular, are there low-bandwidth Internet-of-Things (IoT) applications that might benefit from the propagation characteristics of the 900 MHz band but which do not squarely fit within the B/ILT eligibility requirements? What is the demand for such services and can it be met more efficiently in other bands?

22. We also seek comment on the effect that expanding commercial service on 900 MHz B/ILT channels would have on traditional B/ILT licensees. Would making SMR entities eligible for 900 MHz B/ILT spectrum force traditional B/ILT entities to purchase access to this spectrum from commercial providers? Would sufficient spectrum remain available for them to operate and expand their private internal communication systems? What about on other bands? Are the ongoing needs for narrowband communication sufficient to warrant less flexibility? We note that B/ILT eligibility is a relatively low barrier to gain access to the band and that, once authorized, a B/ILT eligible already has the ability to convert the authorization to commercial use. What impact has this had?

23. Are there any other concerns about negative impacts of expanded commercial service on traditional B/ILT users? For example, would expanding commercial service have a negative effect on current and planned investments by B/ILT licensees? Are there ways in which we can allow additional flexibility but prevent over-commercialization of the band? For instance, could we allow opportunistic use of 900 MHz B/ILT channels that have been converted for commercial service but are not in use? Should any expansion of commercial service on 900 MHz B/ILT channels be accompanied by measures to ensure the prompt initiation of service by licensees in order to prevent the filing of speculative applications or spectrum warehousing?

24. In the event that we were to amend the 900 MHz B/ILT service rules to permit expanded commercial service, should we also amend any other rules in order to expand licensees' technical and operational flexibility? The following are some examples of possible changes, and commenters may address others:

- The rules currently permit aggregation of up to 10 contiguous 900 MHz band channels.⁵⁶ If commercial use of B/ILT channels is expanded, should this limit be increased or eliminated in order to permit the aggregation of B/ILT and SMR channels to provide greater bandwidth? Is it possible to amend the rules to allow sufficient spectrum to be aggregated to provide broadband service?
- Should we relax the limits on how many non-SMR channels may be granted at a time,⁵⁷ or the loading requirements before additional channels can be obtained?⁵⁸
- Should the prohibition against 900 MHz operational fixed stations⁵⁹ be eased or eliminated? Should changes be considered only in rural areas?

⁵⁶ See 47 CFR § 90.645(h).

⁵⁷ See 47 CFR §§ 90.621(a)(1)(iii), 90.623(a), 90.627(a).

⁵⁸ See 47 CFR §§ 90.625(a), 90.627(b)(2), 90.631, 90.633.

⁵⁹ See 47 CFR § 90.637(a).

25. Conversely, should these or any other restrictions be applied more rigorously to expanded commercial service on 900 MHz B/ILT channels, in order to preserve spectrum for traditional B/ILT licensees? With the possible advent of expanded service and/or service providers, would the current distance separation requirements between users⁶⁰ remain adequate? Is there any advanced antenna technology being developed that would create greater spectral efficiency in congested areas? What factors should be considered in the assessment of incumbent service protection?

B. Reconfiguring the Band to Create a Broadband Service

26. We inquire generally as to whether or not the Commission should designate some portion of the 900 MHz band for broadband operations. What would be the operational impacts on current and future B/ILT users of designating a broadband segment and requiring incumbents to relocate to a narrowband segment, and how could those impacts be addressed? Would a broadband service in this band better serve the B/ILT users' needs than the current configuration? Commenters addressing these issues should address the costs and benefits of designating some portion of this band for broadband operations, including providing specific data and information.

27. *Band plan.* If the Commission were to create a narrowband and a broadband segment, what would be the most suitable bandwidth to create a broadband service in the 900 MHz band, taking into account the evolution of wireless technical standards such as Long Term Evolution (LTE)?⁶¹ What would be the minimum viable size for a broadband service? For example, would 3 x 3 megahertz paired blocks be sufficient to create a commercially viable broadband service while ensuring sufficient spectrum for traditional narrowband operations in the band? Where should the broadband spectrum be located, *i.e.*, on one or the other edge of the 900 MHz band, or in the middle with narrowband segments on each side?

28. We also seek comment on whether or not the band should be fully reconfigured to create a 5/5 megahertz broadband channel. In the case of a dynamically shared 5/5 megahertz band, how would channels be most efficiently assigned for narrowband and broadband uses, and how would existing B/ILT users be accommodated? How would it affect their existing and future investments in the band? Would there be a means to repurpose the spectrum that would accommodate the current users without having to segregate and designate narrowband and broadband portions of the band? For example, could both narrowband and broadband users share the same spectrum in a more dynamic manner than by frequency division?

29. We seek to assess the costs and benefits of making a substantial change to the configuration of the 900 MHz band, particularly in light of in the relatively small swath of spectrum and the current usage by a variety of entities. What are the costs and benefits of each band plan approach discussed above, as well as those of any alternatives? For example, would relatively smaller bandwidths (as compared to allocations commonly used by broadband providers in other bands) impact the costs of providing broadband service in this band? Would there be other costs, such as disruption of operations at nuclear facilities, and would it be possible to mitigate those risks and costs? What are the benefits of new services that could become available to B/ILT entities if a broadband service is created either in a portion of the band or in the full band? Will users' future needs include the need for broadband communications services or rely primarily on narrowband communications services? Can such needs be met by existing commercial networks or other current or future service options, including opportunities in other bands? If a 900 MHz band broadband service is created (either in the full band or in part), should B/ILT entities be entitled to priority service? What form could this priority take, and how could it be enforced?

⁶⁰ See 47 CFR § 90.621(b).

⁶¹ LTE is the latest global standard for wireless communication of high-speed data for mobile phones and data terminals, developed by the 3rd Generation Partnership Project. The current LTE specification defines 1.4, 3, 5, 10, 15, and 20 megahertz allocations for LTE. See Overview of 3GPP Release 8 V0.3.3 (2014-09), at 37-38, http://www.3gpp.org/ftp/Information/WORK_PLAN/Description_Releases/.

30. *License assignment.* In the event the Commission reconfigures this band to facilitate the development of a broadband service, we inquire about how the licenses should be assigned. We request that commenters explain the extent to which such policies would be consistent with the Commission's obligations under the Communications Act,⁶² the costs and benefits of different approaches, and whether and to what extent the policies would benefit users.

31. Should the license in each service area be assigned to the entity holding a particular amount of 900 MHz spectrum? If so, what is the appropriate threshold? We also seek comment on whether using spectrum holdings to select the broadband licensee would allow the licensee to obtain a windfall benefit without having to pay for it, and, if so, whether cost to the public of that windfall is outweighed by the benefits of rebanding. If more than one licensee in a service area meets the established spectrum holding threshold, what mechanism should we adopt to decide which licensee is assigned the license?

32. Should the Commission instead accept mutually exclusive applications that would require it to use competitive bidding to assign a license that could be used to realign the band and provide broadband service?⁶³ In the event the Commission determines that an auction is the most efficient means to assign a license to an entity capable of providing broadband service, what kind of auction format would be most appropriate? What set of rights should be included in the license? In particular, to what extent would it be most efficient for the Commission to assign by auction a new license that conveys the right to use all unused spectrum in a given block, the right to operate on a secondary basis to the existing licensee, and the obligation to relocate the existing licensees subject to clear rules? Given that essentially all SMR licenses available in the 900 MHz band have been assigned, does this make the application of an overlay auction more or less likely to produce an efficient outcome? We also ask that commenters compare the characteristics of this band to those of other bands that have established overlay rights to address incumbency issues, such as the 1995 auction of PCS licenses,⁶⁴ and the 2006 auction of AWS licenses.⁶⁵

33. Commenters that believe another mechanism would be a more efficient means of assigning the license should explain how such an alternative mechanism would be more efficient. In addition, we ask commenters to address whether the means by which the broadband license is assigned has any implications for whether the licensee is likely to offer a broadband service that adequately fulfills the needs of PLMR users for ultra-high reliability service, including in rural and suburban communities?

34. If we fully repurpose the band to create a 5/5 megahertz broadband channel, what is the most efficient means of assigning the licenses? Should the licenses offered be an overlay to the existing SMR or B/ILT services, or should the new licensees be required to reband the existing licensees? What are the costs and benefits of such a scheme? What would be the impacts—both economic and non-economic—on existing PLMR operations, including sensitive operations at nuclear and other facilities?

35. Finally, we seek comment on the appropriate license area if the Commission designates a broadband segment of the 900 MHz band. Should we consider geographic units larger than MTAs, or even a nationwide broadband license? How would a proposal to license broadband operation over a

⁶² The Communications Act requires the Commission to use competitive bidding to assign licenses when “mutually exclusive applications are accepted for any initial license,” subject to specified exemptions. See 47 U.S.C. § 309(j)(1)-(2). The Commission is required to promote, *inter alia*, “the development and rapid deployment of new technologies, products, and services for the benefit of the public.” See 47 U.S.C. § 309(j)(3)(A).

⁶³ See 47 U.S.C. § 309(j)(3).

⁶⁴ See *Amendment of the Commission's Rules to Establish New Personal Communications Services*, Second Report and Order, 8 FCC Rcd 7700 (1993).

⁶⁵ See *Amendment of Part 2 of the Commission's Rules to Allocate Spectrum Below 3 GHz for Mobile and Fixed Services to Support the Introduction of New Advanced Wireless Services, including Third Generation Wireless Systems*, Second Report and Order, 17 FCC Rcd 23193 (2002).

larger area affect the considerations discussed above, such as the services that could be provided or the means of selecting the broadband licensee(s)?

36. *Relocation process.* If the 900 MHz band were to be reconfigured, how should the relocation of existing licensees be implemented? Would mandatory relocation cause service disruptions to existing users, and what would be the impacts of such disruptions? Would it be possible to mitigate that impact? We also seek comment on whether, if the Commission were to require mandatory relocation of incumbents, it should establish procedures to ensure that these existing users receive comparable facilities and appropriate reimbursement for relocation. We invite commenters to provide data on what the costs of relocation would be across the band. How should a mandatory relocation be managed in each license area, and by whom? In addition, what would be the appropriate time frame for a mandatory relocation process? We ask that commenters also address the extent to which the rules and procedures governing 800 MHz rebanding would be appropriate for the 900 MHz band.⁶⁶ What other bands could serve as precedent—or as a caution—for relocation in the 900 MHz band?

37. Instead of mandatory relocation, would it be preferable for the Commission to create flexible use rights for SMR licensees, and then require any SMR licensee that wishes to reconfigure the band in a particular area to pay a market price for acquiring the relevant spectrum? If the Commission were to decide that mandatory relocation should not be required, what rules should be adopted to ensure an efficient secondary market for spectrum in this band? How could holdout problems (for example, the problem of a single incumbent that does not agree to relocate to enable creation of a newly configured band) be avoided? We request that commenters articulate the costs and benefits of mandatory relocation versus alternative approaches, along with the potential impacts on incumbents and their customers from each approach.

38. For example, one alternative approach would premise 5/5 megahertz reconfiguration on the agreement of all licensees as of a fixed date in each MTA: Those licensees would be free to subdivide spectrum rights throughout the MTA. So an MTA with a single licensee could reconfigure the band plan to 5/5 megahertz for broadband, subject to technical rules intended to protect operations in adjacent bands and adjacent areas. An MTA with a geographic-based SMR licensee as well as site-based B/ILT licensees would not be reconfigured until all licensees signed off on a mutually acceptable plan. What would be the costs and benefits of such an approach?

39. In addition, we ask commenters to address the relationship between the license selection process (for example, in the case of a new broadband license) and the relocation process for incumbent licensees. We note, for example, that an overlay auction could be used with or without a mandatory relocation requirement for incumbent licensees, with different costs and benefits to incumbent licenses and, ultimately, to all potential consumers in this band.

40. *Technical rules.* We generally seek comment on whether any changes to the technical rules are necessary to keep pace with changing technology, to ensure that this band is used efficiently, and to prevent interference to in-band or adjacent-band licensees. For example, if the Commission were to create a broadband service in the 900 MHz band, it would need to consider rule changes to avoid interference between a broadband licensee and narrowband licensees in adjacent spectrum segments and possible rule changes to avoid interference to services in adjacent bands. We seek comment on the rules that would be necessary, what physical and technical parameters commenters suggest, and whether those rules and parameters would be sufficient to prevent disruption to low-latency, high-reliability utility operations. We also seek comment on what measures would be appropriate to avoid interference between co-channel broadband licensees. What factors should be considered in developing these technical rules? For example, are the receivers in the adjacent services designed to appropriately filter unwanted emissions?

⁶⁶ See, e.g., 47 CFR § 90.699.

C. Retaining the Current Licensing and Eligibility Rules

41. We seek comment on whether the 900 MHz band B/ILT channels should continue to be reserved for site-based B/ILT private internal communications to ensure that spectrum is available to B/ILT entities' private internal communication needs. Would this best serve the public interest? What are the costs and benefits of such an approach? Do the present rules meet the current and future needs of B/ILT entities? Do they accommodate developing technologies, and ensure that the band is being used efficiently? If the Commission retains the current licensing and eligibility rules, should any of the rule changes discussed above to make the spectrum more useful in connection with increasing operational flexibility by permitting expanded commercial service be considered to make the spectrum more useful to B/ILT users?⁶⁷ What amendments to the current technical rules would be desired? What new functionality would result? Are there other narrowband B/ILT services that could be accommodated, or other services, like IoT, that could be accommodated with minor adjustments to the rules? We request that commenters discuss the costs and benefits of the current licensing and eligibility rules, as well as any alternative approaches.

42. As noted above, the Commission amended its rules to allow 900 MHz B/ILT licensees to convert their PLMR authorizations to CMRS authorizations or assign their authorizations to others for CMRS use in large part to accommodate Sprint's need for "green space" for implementing 800 MHz rebanding. That need has passed.⁶⁸ Should the current flexibility to use the spectrum for commercial use be constrained in order to preserve it for B/ILT use? For example, should the Commission consider a holding period before 900 MHz B/ILT channels can be so converted or assigned, as is required for 800 MHz B/ILT channels?⁶⁹

43. Finally, we seek comment on whether the Commission should revisit the 2008 decision not to assign vacant 900 MHz B/ILT channels on a geographic basis by competitive bidding. In 2005, when the Commission proposed to license 900 MHz B/ILT spectrum by geographic area and assign the licenses by competitive bidding, it deemed it consistent with flexible use spectrum management policies, and generally better suited for these types of fixed and mobile services.⁷⁰ It stated that geographic area licensing maximizes flexibility, enables development of new and innovative technologies, and permits economies of scale where usage can be coordinated across an entire geographic area to maximize spectrum use.⁷¹ Would geographic licensing fit the needs of current and future PLMR users? Has subsequent development of the secondary market for geographic spectrum eliminated or reduced the concerns about geographic licensing that commenters expressed in response to the 2005 NPRM in that proceeding?⁷² Have the spectrum uses and needs of B/ILT users changed to perhaps favor geographic licensing? Have users adopted new and innovative technologies that could be utilized more efficiently across geographic areas? What are the costs and benefits of such an approach?

⁶⁷ See *supra* para. 24.

⁶⁸ Applications for 900 MHz B/ILT licenses are now accepted in any NPSPAC region because the Commission began allowing qualified applicants to obtain new service authorizations in regions where 800 MHz rebanding was incomplete with Sprint's concurrence, and Sprint filed a general letter of concurrence stating that it no longer required access to additional 900 MHz B/ILT channels. See *900 MHz Freeze Public Notice*, 28 FCC Rcd at 13166.

⁶⁹ See 47 CFR § 90.621(e)(2).

⁷⁰ See *900 MHz NPRM*, 20 FCC Rcd at 3820-21, paras. 16-17.

⁷¹ See *id.* at 3821, para. 18.

⁷² See *2008 900 MHz Report and Order*, 23 FCC Rcd at 15860-63, paras. 8-12.

IV. PROCEDURAL MATTERS

A. Ex Parte Rules

44. This is an exempt proceeding in which *ex parte* presentations are permitted (except during the Sunshine Agenda period) and need not be disclosed.⁷³

B. Filing Requirements

45. Pursuant to sections 1.415, 1.419, and 1.430 of the Commission's rules, 47 CFR §§ 1.415, 1.419, 1.430, interested parties may file comments and reply comments on or before the dates indicated on the first page of this document. Comments may be filed using the Commission's Electronic Comment Filing System (ECFS). See *Electronic Filing of Documents in Rulemaking Proceedings*, 63 FR 24121 (1998).

- Electronic Filers: Comments may be filed electronically using the Internet by accessing the ECFS: <http://fjallfoss.fcc.gov/ecfs2/>.
- Paper Filers: Parties who choose to file by paper must file an original and one copy of each filing. If more than one docket or rulemaking number appears in the caption of this proceeding, filers must submit two additional copies for each additional docket or rulemaking number.
- Filings can be sent by hand or messenger delivery, by commercial overnight courier, or by first-class or overnight U.S. Postal Service mail. All filings must be addressed to the Commission's Secretary, Office of the Secretary, Federal Communications Commission.
 - All hand-delivered or messenger-delivered paper filings for the Commission's Secretary must be delivered to FCC Headquarters at 445 12th St., SW, Room TW-A325, Washington, DC 20554. The filing hours are 8:00 a.m. to 7:00 p.m. All hand deliveries must be held together with rubber bands or fasteners. Any envelopes and boxes must be disposed of before entering the building.
 - Commercial overnight mail (other than U.S. Postal Service Express Mail and Priority Mail) must be sent to 9300 East Hampton Drive, Capitol Heights, MD 20743.
 - U.S. Postal Service first-class, Express, and Priority mail must be addressed to 445 12th Street, SW, Washington DC 20554.

46. People with Disabilities: To request materials in accessible formats for people with disabilities (braille, large print, electronic files, audio format), send an e-mail to fcc504@fcc.gov or call the Consumer & Governmental Affairs Bureau at 202-418-0530 (voice), 202-418-0432 (tty).

47. Additional Information: For additional information on this proceeding, contact Stana Kimball of the Mobility Division, Wireless Telecommunications Bureau, at Stanislava.Kimball@fcc.gov or 202-418-1306.

V. ORDERING CLAUSES

48. Accordingly, IT IS ORDERED, pursuant to Sections 1, 303, and 403 of the Communications Act of 1934, as amended, 47 U.S.C. §§ 151, 303, and 403, and Section 1.430 of the Commission's rules, 47 CFR § 1.430, that this *Notice of Inquiry* IS ADOPTED.

⁷³ 47 CFR § 1.1204(b)(1).

49. IT IS FURTHER ORDERED that, pursuant to Section 1.407 of the Commission's rules, 47 CFR § 1.407, the petitions of the Enterprise Wireless Alliance and Pacific DataVision, Inc., and of M2M Spectrum Networks, LLC, ARE DENIED, and the proceedings RM-11738 and RM-11755 ARE TERMINATED.

FEDERAL COMMUNICATIONS COMMISSION

Marlene H. Dortch
Secretary