

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

NOTICE OF PROPOSED RULEMAKING

Adopted: March 12, 2019

Released: March 14, 2019

Comment Date: [60 days after Federal Register publication]
Reply Comment Date: [90 days after Federal Register publication]

By the Commission:

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I. INTRODUCTION

1. The 900 MHz band (896-901/935-940 MHz) is designated for narrowband private land mobile radio (PLMR) communications by Business/Industrial/Land Transportation (B/ILT) licensees and for Specialized Mobile Radio (SMR) providers, with deployed systems primarily used for two-way communication by land transportation, utility, manufacturing, and petrochemical companies.

1 See Creation of Interstitial 12.5 Kiloherz Channels in the 800 MHz Band Between 809-817/854-862 MHz et al., WP Docket No. 15-32 et al., Report and Order and Order, FCC 18-143, 2018 WL 5276656 (Oct. 22, 2018).

with the Commission's recent efforts to increase access to flexible-use spectrum,² we propose to reconfigure the 900 MHz band to facilitate the development of broadband technologies and services as well, including for critical infrastructure.

II. BACKGROUND

2. In the non-Federal portion of the United States Table of Frequency Allocations (U.S. Table), the 900 MHz band is currently allocated to the Fixed Service and Land Mobile Service on a co-primary basis.³ 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 Trading Area (MTA)⁴ and B/ILT blocks in which channels are assigned on a site-by-site basis.⁵ To prevent SMR encroachment on PLMR spectrum, the Commission prohibited SMR systems from being authorized on B/ILT channels—but nonetheless also authorized B/ILT licensees to convert their PLMR licenses to commercial mobile radio service (CMRS) licenses or to assign their licenses to others for CMRS use.⁶ While the primary use for SMR traditionally has been dispatch services, the development of a digital SMR marketplace has allowed new features and services, such as internet access, two-way acknowledgment paging, inventory tracking, and fleet management.⁷ B/ILT radio systems serve a variety of communications needs to support the day-to-day business operations, safety, and emergency needs of entities in such industries as land transportation, utilities, manufacturing, and petrochemicals,⁸ including smart grid applications such as advanced metering infrastructure.

3. The 900 MHz band is situated immediately above spectrum that is divided between the commercial Air-Ground Radiotelephone Service, which uses the 894-896 MHz segment as the downlink for high-speed communications services to the public onboard aircraft,⁹ and common carrier and private fixed point-to-point links in the 932.5-935 MHz segment.¹⁰ The 900 MHz band is immediately below the Narrowband Personal Communications Service, which uses the spectrum at 901-902/940-941 MHz, most

² See, e.g., *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) (*Cellular Reform Second Report and Order*).

³ 47 CFR § 2.106. Fixed operations are permitted in the 900 MHz band under limited circumstances. *Id.* § 90.637.

⁴ A Major Trading Area (MTA) is a geographic area based upon the Rand McNally & Company (Rand McNally) 1992 Commercial Atlas & Marketing Guide, 123rd Edition, pages 38-39, used by the Commission to define coverage of spectrum licenses for certain services. For 900 MHz SMR licenses, the Commission uses 51 MTAs, which include the 47 established by Rand McNally, with the following exceptions and additions: Alaska is separated from the Seattle MTA and is licensed separately; Guam and the Northern Mariana Islands are licensed as a single MTA-like area; Puerto Rico and the U.S. Virgin Islands are licensed as a single MTA-like area; and American Samoa is licensed as a single MTA-like area. 47 CFR § 90.7.

⁵ See 47 CFR §§ 90.613, 90.617(c), (f). For a more detailed discussion of the history and use of the 900 MHz band, see *Review of the Commission's Rules Governing the 896-901/935-940 MHz Band; Realignment of the 896-901/935-940 MHz Band to Create a Private Enterprise Broadband Allocation; Amendment of the Commission's Rules to Allow for Specialized Mobile Radio Services Over 900 MHz Business/Industrial Land Transportation Frequencies*, Notice of Inquiry, 32 FCC Rcd 6421, 6421-25, paras. 2-11 (2017) (*NOI*).

⁶ 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, 1536, para. 141 (1995); *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, 15127-28, paras. 335-37 (2004) (*800 MHz Report and Order*); 47 CFR §§ 90.617(c), 90.621(f).

commonly for two-way paging and telemetry, such as the monitoring of utility meters.¹¹

4. In 2017, the Commission released a *Notice of Inquiry* in this docket to examine whether any rule changes may be appropriate to increase access to spectrum, to improve spectrum efficiency, and to expand flexibility in the 900 MHz band, in order to better serve users' current and future communications needs.¹² It sought comment on several ideas, including: reconfiguring the band to create a broadband service,¹³ as suggested by the Enterprise Wireless Alliance (EWA) and pdvWireless, Inc. (PDV),¹⁴ and allowing SMR systems on B/ILT channels,¹⁵ as suggested by M2M Spectrum Networks, Inc. (M2M).¹⁶

5. Most commenters support, at least in principle, the creation of a 900 MHz broadband service.¹⁷ They recognize that broadband is an effective tool for addressing the current and future communications needs of a wide range of the 900 MHz band users,¹⁸ and they agree that a broadband service targeted to B/ILT entities could provide the coverage and reliability that electric and other utilities require but cannot obtain from consumer-oriented commercial wireless carriers.¹⁹ Some commenters unreservedly advocate adoption of EWA and PDV's realignment plan.²⁰ Others' support is contingent on the Commission addressing certain concerns, such as preserving their ability to operate and expand 900 MHz narrowband systems, preventing interference to such operations from broadband systems, and minimizing the cost and disruption of band realignment.²¹ Based on such concerns, a smaller group of commenters, mostly electric and other utilities, ask that we not designate any portion of the 900 MHz band for broadband operations.²² No commenters support the M2M proposal, and M2M now supports 900 MHz band realignment rather than its initial proposal.²³

6. On September 13, 2018, the Wireless Telecommunications Bureau suspended the acceptance of applications for new or expanded 900 MHz operations to maintain a stable spectral

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⁷ See *Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993: Annual Report and Analysis of Competitive Market Conditions with Respect to Commercial Mobile Services*, Eleventh Report, 21 FCC Rcd 10947, 10972-73, para. 64 (2006).

⁸ 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, 15858, para. 2 (2008).

⁹ See 47 CFR pt. 22, Subpart G. AC BidCo, LLC, a subsidiary of Gogo Inc., holds the nationwide licenses for the 894-896 MHz band.

¹⁰ See 47 CFR § 101.101.

¹¹ See *id.* § 24.129.

¹² See *NOI*, 32 FCC Rcd at 6421, para. 1.

¹³ See *id.* at 6430-32, paras. 26-40.

¹⁴ See Petition for Rulemaking of the Enterprise Wireless Alliance and Pacific DataVision, Inc., RM-11738 (filed Nov. 17, 2014), <https://www.fcc.gov/ecfs/filing/60000983985> (EWA/PDV Petition); *Ex Parte* Comments, Proposed 900 MHz PEBB Allocation Rules, RM-11738 (filed May 4, 2015) (EWA/PDV Proposed Rules), <https://www.fcc.gov/ecfs/filing/60001030774>; Enterprise Wireless Alliance and pdvWireless, Inc. Comments, WT Docket No. 17-200 (filed May 1, 2018), <https://www.fcc.gov/ecfs/filing/10501075523973> (EWA/PDV Further Comments). EWA, a Part 90 PLMR frequency coordinator for 900 MHz and other PLMR channels, is an organization that represents many 900 MHz band licensees. See EWA/PDV Petition at 12. PDV (formerly known as Pacific DataVision) 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.

landscape while the Commission determines how to proceed with respect to that spectrum.²⁴

III. DISCUSSION

7. We recognize the importance of wireless broadband not only for the consumer public, but also for large and small businesses. High-speed broadband is essential for robust business growth, and providing an opportunity for broadband in the 900 MHz band could enable a wide variety of businesses to unlock the full potential of broadband and its applications. Electric utilities in particular have many ways to enhance their operations, such as installing smart grid systems and using dedicated broadband spectrum to improve coverage, latency, and throughput.²⁵ For example, Ameren Services Company is testing 900 MHz broadband solutions for metering, monitoring and control of energy facilities pursuant to experimental authorization.²⁶ Even entities that use commercial services throughout many parts of their business assert that they cannot use such services for mission-critical communications, and instead rely on private radio systems.²⁷

8. We believe that realigning the 900 MHz band will create opportunities for robust broadband networks that fully support critical communication systems and that ensure the low latency and ultra-high reliability required by electric and other utilities, as well as other B/ILT and SMR spectrum users. Accordingly, we propose to realign the 900 MHz band to enable broadband deployment, and we seek comment on how to realign the band, how to conduct a transition, and the technical rules needed to make the realignment a reality.

A. Band Realignment to Create Broadband Licenses

9. We propose to realign the 900 MHz band to create a broadband segment and to reserve the remainder of the 900 MHz band for continued narrowband operations. We believe this proposal furthers important goals of the Communications Act of 1934, as amended (Communications Act),

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¹⁵ See *NOI*, 32 FCC Rcd at 6428-30, paras. 19-25.

¹⁶ Petition for Rulemaking of M2M Spectrum Networks, LLC, RM-11755 (filed June 29, 2015), <http://appsint.fcc.gov/ecfs/document/view?id=60001108411>.

¹⁷ See, e.g., Utilities Technology Council and GridWise Alliance Reply, WT Docket No. 17-200, at 2.

¹⁸ See, generally, e.g., United Parcel Service, Inc. Comments, WT Docket No. 17-200 (UPS Comments); Western Farmers Electric Cooperative Comments, WT Docket No. 17-200 (WFEC Comments); American Petroleum Institute Comments, WT Docket No. 17-200 (API Comments); Eversource Energy Comments, WT Docket No. 17-200 (Eversource Comments); Traverse City Light & Power Comments, WT Docket No. 17-200 (TCLP Comments).

¹⁹ See, e.g., TCLP Comments at 1-2; Eversource Comments at 1-2.

²⁰ See, e.g., A Beep, LLC Comments, WT Docket No. 17-200, at 1-2.

²¹ See, e.g., API Comments at 5-7; Eversource Comments at 1-2; TCLP Comments at 1-2.

²² See, e.g., NextEra Comments, WT Docket No. 17-200, at 6-10 (NextEra Comments); Lower Colorado River Authority Comments, WT Docket No. 17-200, at 7-10 (LCRA Comments); Critical Infrastructure Coalition Comments, WT Docket No. 17-200, at 9-13 (CIC Comments); Edison Electric Institute Comments, WT Docket No. 17-200, at 13-15 (EEI Comments). Commenters opposed to band realignment were particularly concerned about mandatory relocation.

²³ See M2M Spectrum Networks, LLC Comments, WT Docket No. 17-200, at 2-3.

²⁴ See *Wireless Telecommunications Bureau Announces Temporary Filing Freeze on the Acceptance of Certain Part 90 Applications for 896-901/935-940 MHz (900 MHz Band) Spectrum*, Public Notice, WT Docket No. 17-200, DA 18-949 (WTB Sept. 13, 2018) (*900 MHz Freeze Public Notice*). On October 15, 2018, the Utilities Technology Council filed a petition for reconsideration or clarification of the *900 MHz Freeze Public Notice*. Petition for

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including improving the efficiency of spectrum use.²⁸ We seek comment on this view.

10. *Broadband segment size.* The Commission sought comment in the *Notice of Inquiry* on the most suitable bandwidth for a 900 MHz broadband segment and asked in particular whether a paired three megahertz (3/3 megahertz) broadband segment, as suggested by EWA and PDV, would best balance the operational requirements of both broadband and narrowband users in the 900 MHz band.²⁹

11. We propose a 3/3 megahertz broadband segment. We anticipate that paired three megahertz blocks would be most suitable to create a viable broadband service in this band, and that paired 1.5 and .5 megahertz blocks could provide enough spectrum for 900 MHz narrowband operations. Three megahertz blocks are supported by wireless technical standards such as Long Term Evolution (LTE),³⁰ and they are also favored by commenters.³¹ Our goal is to open the 900 MHz band for additional uses that will facilitate increased efficiency and encourage innovation, while continuing to accommodate narrowband incumbents. We seek comment on our proposed approach, including its costs and benefits.

12. Given that the broadband segment of 3/3 megahertz is less than what the Commission has designated for other flexible-use broadband services in the past,³² we anticipate that the end users of 900 MHz broadband services may not be traditional wireless retail consumers. A 3/3 megahertz broadband link would have relatively limited capacity and speed compared to existing nationwide and regional 4G networks and, by itself, might not be able to serve direct-to-consumer demand in densely populated areas. Further, because of the challenges of clearing 900 MHz narrowband incumbents from the broadband segment, we believe that this spectrum is more likely to be used to serve PLMR customers. 900 MHz broadband licensees may be better positioned to focus on business, enterprise, and government customers

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Reconsideration or Clarification of the Utilities Technology Council, WT Docket No. 17-200 (filed Oct. 15, 2018). That request is pending.

²⁵ See, e.g., Lockard & White, Inc. Reply Comments, WT Docket No. 17-200, at 2 (“A significant majority of our incumbent clients are planning to implement wireless wideband and broadband networks over the next five years to meet their critical infrastructure network needs.”); Utilities Technology Council (formerly named the Utilities Telecom Council) Oct. 23, 2009 Comments, GN Docket No. 09-47, at 11-13 (UTC Oct. 23, 2009 Comments).

²⁶ See Letter from Elizabeth R. Sachs, to Marlene H. Dortch, Secretary, FCC, WT Docket No. 17-200, at 1 (filed April 20, 2018). On May 10, 2018, Ameren Service Company was granted a two-year experimental license under Call Sign WJ2XMH to use 900 MHz channels in a broadband and narrowband configuration.

²⁷ See, e.g., UPS Comments at 4 (“[F]or mission-critical communications at many of our larger facilities, no existing LTE service provider to date has been willing or able to guarantee contractually the service levels we require.”).

²⁸ See 47 U.S.C. § 332(a)(2).

²⁹ See *NOI*, 32 FCC Rcd at 6430, para. 27.

³⁰ 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 (3GPP). 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/. Industry standards for LTE are developed by 3GPP, an international partnership of industry-based telecommunications standards bodies that, among other things, establishes standards for different LTE band classes. See ABOUT 3GPP, <http://www.3gpp.org/about-3gpp> (last visited Oct. 24, 2018). 900 MHz band spectrum is within 3GPP Band Classes 8 and 81, which have been identified for provision of 5G services. See 3GPP Release 15: 3GPP TS 38.101-2 V15.1.0 (2018-03) available at http://www.3gpp.org/ftp/Specs/archive/38_series/38.101-2/38101-2-f10.zip.

³¹ Few discuss the most suitable bandwidth. Of those that do, most argue that 3/3 megahertz is the appropriate size of a broadband segment within the 900 MHz band. See, e.g., Puloli, Inc., Oct. 2, 2017 Comments, WT Docket No. 17-200, at 2 (“The 3 MHz LTE channelization will allow the support of concurrent services such as data, VoLTE (Voice over LTE), push-to-talk, Cat-M IoT, and NB-IoT.”).

³² For example, the bandwidth per license ranges from 5 megahertz to 20 megahertz for Advanced Wireless Services (AWS -3) licenses (<https://www.fcc.gov/auction/97/factsheet>), from 6 megahertz to 12 megahertz for 700 MHz

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whose needs are not being met by the consumer-driven, nationwide, 4G service offerings. We ask commenters to describe specifically how the proposed realignment would or would not help PLMR users or other potential users meet their current and future broadband needs. Commenters also should discuss whether we should adopt any particular requirements designed to ensure that 900 MHz broadband services meet the operational requirements of B/ILT entities.

13. *Allocation of 900 MHz band.* To provide additional flexibility for the deployment of broadband services in the 900 MHz band, we propose to replace the Land Mobile Service allocation in the 900 MHz band with a Mobile Except Aeronautical Mobile Service allocation on a co-primary basis with the Fixed Service, consistent with the allocations in the 890-902 MHz and 928-942 MHz bands in Region 2 of the International Table of Frequency Allocations.³³ We note that the Land Mobile Service is a subset of the Mobile Except Aeronautical Mobile Service.³⁴ We seek comment on these proposals, including their costs and benefits.

14. We believe our proposed framework meets the requirements for the allocation of flexible use spectrum under section 303(y) of Communications Act.³⁵ Section 303(y) allows the Commission to allocate spectrum for flexible uses if the allocation is consistent with international agreements and if the Commission finds that: (1) the allocation is in the public interest; (2) the allocation does not deter investment in communications services and systems, or development of technologies; and (3) such use would not result in harmful interference among users.³⁶ A non-Federal Fixed and Mobile allocation is consistent with international allocations for use of the 900 MHz band.³⁷ Further, as explained throughout this *Notice of Proposed Rulemaking*, we believe our proposed licensing framework for 900 MHz broadband systems will spur innovation and investment in new wireless technologies, while preserving incumbent uses. Finally, we seek comment on technical rules designed to prevent interference between users of the band, as well as users of adjacent bands. We seek comment on this analysis.

15. *Location of the broadband segment.* We propose to designate 897.5-900.5 MHz/936.5-939.5 MHz as the broadband segment, leaving two separate narrowband segments: a 1.5/1.5 megahertz segment (896-897.5/935-936.5 MHz) below the broadband segment and a .5/.5 megahertz segment (900.5-901/939.5-940 MHz) above the broadband segment.³⁸ This arrangement provides 1.5 megahertz of separation between the broadband segment and the 894-896 MHz Air-Ground Radiotelephone Service/932-935 MHz fixed microwave systems spectrum, and 500 kilohertz of separation between the broadband segment and the 901-902/940-941 MHz Narrowband Personal Communications Service

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licenses (<https://www.fcc.gov/auction/92/factsheet>; <https://www.fcc.gov/auction/73/factsheet>), and from 10 megahertz to 30 megahertz for broadband PCS licenses (<https://www.fcc.gov/auction/71/factsheet>).

³³ 47 CFR § 2.106. In Region 2 of the International Table of Frequency Allocations, the 890-902 MHz and 928-942 MHz bands are allocated to the Fixed Service and Mobile Except Aeronautical Mobile Service on a co-primary basis and the Radiolocation Service on a secondary basis. *Id.* The International Table of Frequency Allocations, included in the Commission's rules for informational purposes only, is subdivided into the Region 1 Table, the Region 2 Table, and the Region 3 Table. The U.S. Table is based on the Region 2 Table because the relevant area of jurisdiction is located primarily in Region 2 (*i.e.*, the 50 States, the District of Columbia, the Caribbean insular areas, and some of the Pacific insular areas). *Id.* §§ 2.104, 2.105.

³⁴ See International Telecommunication Union Recommendation SM.1133 at 2, available at <https://www.itu.int/rec/R-REC-SM.1133/en>.

³⁵ See 47 U.S.C. § 303(y).

³⁶ *Id.*

³⁷ See 47 CFR § 2.106.

³⁸ That is, we propose that the broadband segment be composed of the existing channels with center frequencies from 897.5125/936.5125 MHz (channel 121) to 900.5/939.5 MHz (channel 360). See 47 CFR § 90.613. Channels 1-120 and 361-399 would continue to be designated for narrowband operations.

spectrum. We note that Sensus, Inc. (Sensus), an operator of metering systems in Narrowband Personal Communications Service spectrum, warned of potential interference from placing the broadband segment immediately adjacent to this spectrum,³⁹ but it views at least 400 kilohertz as sufficient separation to address those concerns.⁴⁰

16. We believe that our proposed location for the broadband segment has several other benefits. First, it does not split any of the geographic SMR license blocks between the broadband segment and narrowband spectrum, which would potentially complicate band realignment.⁴¹ Moreover, separate narrowband segments, rather than a single 2/2 megahertz segment, would allow greater flexibility in frequency selection for narrowband licensees to provide adequate space between co-located channels.⁴² In addition, our proposal would preserve the possibility of transitioning the 1.5/1.5 megahertz segment to a 1.4/1.4 megahertz LTE channel at some later date, if that proves warranted.⁴³ Finally, putting the 1.5/1.5 megahertz segment on the lower side of the 900 MHz band would reduce the impact of realignment on 900 MHz band channels assigned throughout the country to the railroad industry for advanced train control systems.⁴⁴

17. We seek comment on our proposal to designate 897.5-900.5 MHz/936.5-939.5 MHz as the broadband segment. Commenters should provide input on the reasons set forth above, and whether there are other costs or benefits of this proposal or any alternative proposals. Commenters are also asked to address whether our proposed broadband segment poses any potential for harmful interference to systems in adjacent bands—Air-Ground Radiotelephone Service and fixed microwave systems in the spectrum immediately below the 900 MHz band or Narrowband Personal Communications Service operations in the spectrum immediately above the 900 MHz band—and to analyze and quantify the risk of such harmful interference, if possible.

18. We also seek comment on the extent to which our proposal would benefit current narrowband users by helping them meet their broadband needs. We recognize that many narrowband

³⁹ See Sensus Reply Comments, WT Docket No. 17-200; Sensus Comments, WT Docket No. 17-200; Sensus Reply Comments, RM-11738; Sensus Comments, RM-11738.

⁴⁰ Specifically, Sensus endorsed the 897.6-900.6 MHz/936.6-939.6 MHz broadband segment suggested by EWA and PDV, which would have provided 400 kilohertz separation from the Narrowband Personal Communications Service, *i.e.*, less separation than we propose. See Sensus Further Comments, WT Docket No. 17-200, at 3.

⁴¹ Our proposed broadband arrangement puts SMR Blocks G through R entirely in the broadband segment.

⁴² See EWA/PDV Further Comments at 16. Combiners used in a trunked system to aggregate the output of multiple transmitters into a single antenna can introduce excessive loss if used with channels that are too closely spaced. *800 MHz Report and Order*, 19 FCC Rcd at 15053-54, para. 156 (citing *Development of Operational, Technical and Spectrum Requirements for Meeting Federal, State and Local Public Safety Agency Communication Requirements Through the Year 2010; Establishment of Rules and Requirements for Priority Access Service*, Third Memorandum Opinion and Order and Third Report and Order, 15 FCC Rcd 19844, 19857, para. 30 (2000)). The use of two narrowband segments increases the options for greater spectral separation of co-located channels.

⁴³ See *Service Rules for the 698-746, 747-762 and 777-792 MHz Bands; Implementing a Nationwide, Broadband, Interoperable Public Safety Network in the 700 MHz Band; Amendment of Part 90 of the Commission's Rules*, 26 FCC Rcd 733, 766, para. 120 (2011) (noting that some LTE devices are certified for operation in 1.4/3/5 megahertz bandwidths).

⁴⁴ See *Petition of Association of American Railroads (AAR) for Modification of Licenses for Use in Advanced Train Control Systems and Positive Train Control Systems*, Order, 16 FCC Rcd 3078 (WTB PSPWD 2001) (granting a nationwide ribbon license surrounding railroad rights-of-way for frequency pairs 896.8875/935.8875 MHz, 896.9375/935.9375 MHz, 896.9875/935.9875 MHz, 897.8875/936.8875 MHz, 897.9375/936.9375 MHz, and 897.9875/936.9875 MHz). Placing the smaller narrowband segment at the bottom of the 900 MHz band would result in all six railroad channels being in the broadband segment. Placing the larger narrowband segment at the bottom of the 900 MHz band rather than the top would mean that only three of the six railroad channels would have to be relocated out of the broadband segment.

incumbents have broadband communications needs that are currently unmet. For example, the Western Farmers Electric Cooperative, after conducting an 18-month engineering study to assess its long-term telecommunications requirements, concluded that its future needs cannot be met by traditional networks that lack broadband capacity.⁴⁵ Electric and other utilities need broadband capacity to support smart grid and other next generation communications systems.⁴⁶ The oil and natural gas industry expects to deploy thousands of Internet of Things (IoT) devices for its critical systems but struggles to find reliable and secure commercial networks.⁴⁷ We seek comment on the need for such broadband capacity, on its importance for critical infrastructure industries, and on the adequacy of existing commercial broadband services to meet such needs.

19. *Newly designated narrowband segment.* Under our proposal, in the markets that are transitioned to broadband use through one or more of the mechanisms described in Section III.B, the 896-897.5/935-936.5 MHz and 900.5-901/939.5-940 MHz bands would no longer have a distinction between B/ILT and SMR blocks, but instead they would be designated as the narrowband segment available for site-based operations. Designating the narrowband segment in this way would make it easier for existing operations of both B/ILT and SMR site-based licensees to be relocated from the broadband segment to achieve band realignment. We seek comment on the rule modifications that may be necessary to facilitate band realignment and the creation of separate narrowband and broadband segments. Specifically, how should the Commission grant access to the narrowband segment and determine eligibility for narrowband segment licenses? To what extent will the Commission's interference protection criteria need to be modified to account for the existence of incumbent users and new licensed operations in the narrowband segment? We also seek comment on whether any necessary rule changes may vary depending on the specific transition mechanisms discussed in Section III.B that the Commission may implement.

20. *An alternative realignment.* As an alternative, some commenters suggest realigning the entire band to create a 5/5 megahertz broadband channel.⁴⁸ We seek comment on redesignating the entire band for broadband operation. We seek specific comment on whether we should take any action to facilitate 5/5 megahertz broadband operation on a nationwide basis or only in particular areas, such as where a single licensee controls all or almost all of the band or where there are very few narrowband users and little demand as demonstrated by lack of licensing activity. What additional rule changes, if any, would we need to make to effectuate such a proposal? Commenters should also discuss and quantify the costs and benefits of this or any other alternative approaches, such as a 1.4/1.4 megahertz broadband channel coupled with larger protection bands between broadband and narrowband operations.⁴⁹

⁴⁵ WFEC Comments at 1-2 (stating that a medium growth scenario would require an average of 5 Megabits per second to each endpoint in the network by the year 2023, a requirement that is "clearly outside of the capabilities of traditional narrowband and wideband radio access networks").

⁴⁶ See UTC Oct. 23, 2009 Comments at 7-12; Oncor Electric Delivery Company LLC Comments, WT Docket No. 17-200, at 1-2 ("Not only will Oncor's planned upgrade to its mission's critical communications system utilize the narrowband channels, but its implementation of smart grid applications will require additional narrowband and broadband capabilities.").

⁴⁷ See, e.g., API Comments at 4-5.

⁴⁸ See, e.g., Letter from Donald J. Evans, Counsel to Southern California Edison (SCE), to Marlene H. Dortch, Secretary, FCC, WT Docket No. 17-200, Attach. 3 at 1 (filed Mar. 7, 2019) (SCE March 7, 2019 *Ex Parte* Letter); Letter from Donald J. Evans, Counsel to SCE, to Marlene H. Dortch, Secretary, FCC, WT Docket No. 17-200, Attach. (filed Feb. 27, 2019); WFEC Comments at 3; Steven A. Zecola Reply Comments, WT Docket No. 17-200, at 5; Duke Energy Corporation Comments, WT Docket No. 17-200, at 9.

⁴⁹ See, e.g., Letter from Bryan N. Tramont and Timothy J. Cooney, Counsel to NextEra, to Marlene H. Dortch, Secretary, FCC, WT Docket No. 17-200, at 4 (NextEra March 8, 2019 *Ex Parte* Letter); SCE March 7, 2019 *Ex Parte* Letter at 2; Letter from Bryan N. Tramont and Timothy J. Cooney, Counsel to NextEra, to Marlene H. Dortch, Secretary, FCC, WT Docket No. 17-200, Attach. at 6 (filed Mar. 6, 2019) (NextEra March 6, 2019 *Ex Parte* Letter); Letter from Todd Inlander, Senior Vice President & CEO, SCE, to Marlene H. Dortch, Secretary, FCC, WT Docket

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21. *Geographic licensing.* Consistent with our approach in several other bands used to provide fixed and mobile services, we propose to license the broadband segment on a geographic area basis.⁵⁰ Geographic area licensing promotes spectrum efficiency and expedites deployment of flexible use services.⁵¹ It also provides licensees with flexibility to adjust and coordinate spectrum usage quickly, based on changing market conditions.⁵² We seek comment on this approach, including on the costs and benefits of adopting a geographic area licensing scheme.

22. We seek comment on the appropriate geographic licensing area for the broadband segment.⁵³ We believe that the 900 MHz broadband licensing structure should be flexible enough to support and encourage next-generation services. We note that the appropriate geographic licensing area may vary depending on the specific transition mechanism the Commission ultimately uses to realign this band. For example, due to wide variations in levels of incumbent use of 900 MHz band across geographic areas, we seek comment on issuing broadband licenses on a county-by-county basis. The Commission has used county-based licensing for other bands that will be used for 5G and IoT services, such as the 28 GHz band⁵⁴ and 3.5 GHz band.⁵⁵ Counties or other smaller geographic areas also may better align with the needs of electric utilities and other B/ILT eligibles wishing to obtain licenses to meet their own broadband needs.⁵⁶ We seek comment on whether licensing 900 MHz broadband spectrum by county would help foster flexible and innovative use of the 900 MHz band in all areas by providing a consistent, relatively small license size appropriate for a wide range of possible network deployments. We also seek comment on whether to base such a county licensing scheme on 2017 county boundaries, the most recent county boundaries currently available through the Census Bureau, as used in the 3.5 GHz band.⁵⁷ As an alternative, we seek comment on issuing broadband licenses over a larger geography.

23. Commenters should address the most suitable license area for 900 MHz band broadband

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No. 17-200, at 3 (filed Feb. 22, 2019); Letter from Bryan N. Tramont and Timothy J. Cooney, Counsel to NextEra, to Marlene H. Dortch, Secretary, FCC, WT Docket No. 17-200, Attachment “Engineering Report” prepared by Gillespie, Prudhon & Associates, Inc. at 20-22 (filed Sept. 21, 2018).

⁵⁰ See, e.g., 47 CFR § 27.6(h), (i) (AWS-1 and AWS-4, respectively); see also, e.g., *Use of Spectrum Bands Above 24 GHz for Mobile Radio Services*, Report and Order and Further Notice of Proposed Rulemaking, 31 FCC Rcd 8014, 8029-30, 8046-47, paras. 35-36, 82 (2016) (*Spectrum Frontiers Report and Order*) (adopting geographic license areas intended to suit the development of innovative wireless services).

⁵¹ See, e.g., *Expanding Flexible Use of the 3.7 to 4.2 GHz Band*, Order and Notice of Proposed Rulemaking, 33 FCC Rcd 6915, 6961, para. 138 (2018) (*Mid-Band NPRM*).

⁵² See, e.g., *Matter of Amendment of Parts 1, 21, 73, 74, and 101 of the Commission’s Rules to Facilitate the Provision of Fixed and Mobile Broadband Access, Educational and Other Advanced Services in the 2150-2162 and 2500-2690 MHz Bands*, Report and Order and Further Notice of Proposed Rulemaking, 19 FCC Rcd 14165, 14191, para. 57 (2004).

⁵³ In determining the appropriate geographic license size, the Commission generally considers several factors, including: (1) facilitating access to spectrum by both small and large providers; (2) providing for the efficient use of spectrum; (3) encouraging deployment of wireless broadband services to consumers, especially those in rural areas and tribal lands; and (4) promoting investment in and rapid deployment of new technologies and services. See, e.g., *Service Rules for Advanced Wireless Services in the 1.7 GHz and 2.1 GHz Bands*, Report and Order, 18 FCC Rcd 25162, 25175, para. 35 (2003) (*AWS-1 Service Rules Order*); see also 47 U.S.C. § 309(j)(3)-(4). As indicated below, another relevant factor to this band is accommodating the broadband needs of electric utilities and other B/ILT eligibles.

⁵⁴ See *Spectrum Frontiers Report and Order*, 31 FCC Rcd at 8029, para. 35. We note that the 28 GHz county licenses will be defined by 1990 county boundaries in order to align with incumbent 28 GHz licenses, which were issued as Basic Trading Areas that were based on 1990 county boundaries. See *Auctions of Upper Microwave Flexible Use Licenses for Next-Generation Wireless Services; Notice and Filing Requirements, Minimum Opening Bids, Upfront Payments, and Other Procedures for Auctions 101 (28 GHz) and 102 (24 GHz)*, Public Notice, 33 FCC Rcd 7575, 7579 para. 6 note 15 (2018).

licenses, and explain the costs and benefits of various approaches, especially with respect to rural areas. Would larger geographic licenses limit the ability of electric utilities or other non-traditional stakeholders in acquiring such licenses? Conversely, are there additional reasons that make larger geographic areas better suited for the broadband license? Stakeholders also should comment on what license size would best facilitate relocation of incumbent users. For example, a smaller license area may reduce the number of incumbents that would need to relocate before deploying a broadband system—but a larger license area may reduce the number of potential broadband licensees that any given incumbent would need to negotiate with.⁵⁸ Or to put it another way, if the Commission decides to use small license areas, multiple broadband licensees might need to act in concert to clear incumbents in the area, whereas if the Commission decides to use larger license areas, more incumbents might need to be cleared before any broadband operations commence.

B. Transition to the New Band Alignment

24. A transition of the 900 MHz band presents particular challenges given the unique spectrum characteristics, varied incumbent uses, and intensity of use in particular geographic areas. In certain areas of the country, the 900 MHz band is heavily encumbered,⁵⁹ with the greatest number of stations located in the coastal Northeast, the Carolinas, the Atlanta region, Florida, the Great Lakes region, the Gulf Coast area, coastal Washington State, and throughout California. For example, in Los Angeles County, California and Broward County, Florida, almost every 900 MHz channel is assigned, including almost every channel in our proposed broadband segment. In contrast, in Cass County, North Dakota, a far less populated area, all SMR channels have been assigned, but no B/ILT channels are in use. As a result, any transition mechanism the Commission adopts for the 900 MHz band must account for such variations in the intensity of spectrum use across geographic areas and provide for alternatives where necessary.

25. In light of these unique challenges of realigning the 900 MHz band, we first propose to authorize a market-driven, voluntary exchange process that would allow existing licensees to come together and mutually agree to a plan for relocating site-based incumbents and transitioning the band for broadband use. We recognize, however, that a voluntary process may not be successful in all markets, particularly those with a substantial number of incumbents. Therefore, in order to facilitate a nationwide realignment for broadband uses, the Commission may need to consider alternatives to be used in combination with a voluntary exchange process. We seek comment on such alternatives, including specifically two other methods of transitioning the band to broadband use: an auction of overlay licenses and an incentive auction. We seek comment on the costs and benefits of our proposal, any alternatives, and their combinations.⁶⁰

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⁵⁵ See *Promoting Investment in the 3550-3700 MHz Band*, GN Docket No. 17-258, Report and Order, FCC 18-149, at 16, para. 28 (Oct. 24, 2018), 2018 WL 5311439 (*3.5 GHz Report and Order*). For the 3.5 GHz band, the Commission plans to rely on 2017 county boundaries, the most recent boundaries currently available through the Census Bureau. See *3.5 GHz Report and Order*, Appendix A, Final Rules.

⁵⁶ See EWA/PDV Further Comments at iv, 19-20.

⁵⁷ See *3.5 GHz Report and Order*, Appendix A, Final Rules.

⁵⁸ For example, Cleco Power LLC, licensee of 900 MHz B/ILT Station WPZH547, has base stations in Rapides, Beauregard, Natchitoches, and Sabine Parishes, Louisiana, with a 48-kilometer radius operating around each base station for mobile operations in surrounding parishes.

⁵⁹ A recent review of the Commission's Universal Licensing System database shows approximately 2,700 900 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.

⁶⁰ On September 14, 2018, NextEra Energy, Inc. filed a cost-benefit analysis of EWA and PDV's proposal, including their proposed mandatory relocation scheme. See Letter from Bryan N. Tramont and Timothy J. Cooney, (continued....)

1. A Market-Driven Voluntary Exchange Process

26. We propose to initially rely on a market-driven approach through which 900 MHz licensees may engage in voluntary exchange mechanisms to facilitate clearing of the broadband segment. This approach seeks to take advantage of the speed and efficiency of voluntary realignment through private agreements between incumbents. In proposing voluntary realignment, we must nevertheless ensure that such a process fulfills the Commission's statutory obligations to license spectrum in the public interest.⁶¹ While the Commission seeks to repurpose spectrum in a manner likely to increase the public's access to affordable broadband wireless communications services, we also recognize the public interest benefit, particularly in the 900 MHz band, of a realignment that maintains access to sufficient narrowband spectrum for PLMR services. We therefore anticipate that realignment of the 900 MHz band may be best achieved by allowing those parties with knowledge of incumbents' existing operations and future needs to engage in market-based negotiations to clear the new broadband segment. We note that the Commission has broad authority to determine in the public interest what licensing scheme fits best with the characteristics of particular bands and services,⁶² and seek comment on how that authority should be applied to address the licensing of 900 MHz broadband services.

27. We propose to give site-based incumbents the opportunity to relocate on a voluntary basis and allow an eligible party to acquire a broadband license on a county-by-county basis in the cleared spectrum. Under this proposal, we would require the prospective broadband licensee to hold the licenses for all 20 geographically-licensed blocks of 900 MHz SMR spectrum in the relevant county. The prospective broadband licensee could then negotiate with site-based incumbents to move narrowband operations out of the broadband segment and agree to clear the spectrum to enable use of 3/3 megahertz of contiguous spectrum. Subject to the restrictions and requirements discussed in this section, the new broadband licensee could then apply for a license to operate on a primary basis in the 3/3 megahertz broadband segment in each county it successfully clears.

28. *Eligibility.* We propose certain eligibility restrictions in order to qualify for a new 3/3 megahertz license in the broadband segment. Our proposed process includes the minimum necessary restrictions and requirements to ensure those agreements include all relevant site-based incumbents and actions that are necessary to successfully transition the band. The proposed market-driven voluntary exchange approach described below would limit basic eligibility for broadband licenses to those incumbents that hold 20 geographically licensed blocks of 900 MHz SMR spectrum, which we anticipate would be best positioned to facilitate the transactions necessary to effectuate relocation.⁶³ Alternatively, we seek comment on whether to allow a licensee to use any combination of 900 MHz spectrum (e.g., B/ILT and/or SMR) to be eligible for a new broadband license, provided that such spectrum totals at least 5 megahertz and covers the entire county for which it seeks a license. We recognize that there are key differences between 900 MHz MTA-based SMR licenses acquired through auction and site-based licenses largely acquired on a first come-first served basis by demonstrating a need to use limited channels for internal purposes. Geographically licensed SMR incumbents currently provide land mobile communications services on a commercial basis over large geographic areas (specifically MTAs). In comparison, site-based licensees, particularly B/ILT, generally have substantially less spectrum holdings that cover a limited geography, and they use a network architecture that employs non-contiguous channels

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_____ Counsels to NextEra, to Marlene H. Dortch, Secretary, FCC, WT Docket No. 17-200, Attachment "The Economics of the 900 MHz Proposal" prepared by the Brattle Group (filed Sept. 14, 2018). *See also* EWA/PDV Further Comments, Attachment 1 at 18.

⁶¹ 47 U.S.C. § 310(d).

⁶² *See* 47 U.S.C. § 309(j)(6)(E); *Benkelman Tel. Co. v. FCC*, 220 F.3d 601, 605-06 (D.C. Cir. 2000); *Bachow Communications, Inc. v. FCC*, 237 F.3d 683 (D.C. Cir. 2001); *DIRECTV, Inc. v. FCC*, 110 F.3d 816 (D.C. Cir. 1997); *M2Z Networks, Inc. v. FCC*, 558 F.3d 554 (D.C. Cir. 2009).

⁶³ *See Mobile Relay Associates v. FCC*, 437 F.3d 1, 8-10 (D.C. Cir. 2006).

to avoid intra-system interference. In addition, limits on the number of site-based frequencies that may be assigned effectively prevent a single site-based licensee from controlling a substantial portion of the site-based channels.⁶⁴ We seek comment on the process outlined in this section and any further eligibility restrictions that may be necessary to serve the Commission's goals.

29. To be eligible for a new 900 MHz broadband license in a given county, we propose that the applicant must: (1) hold licenses covering the entire county for all 20 geographically-licensed SMR blocks,⁶⁵ (2) reach an agreement to clear from the broadband segment, or demonstrate how it will protect, all covered incumbent licensees, and (3) agree to return to the Commission all 900 MHz licenses for the relevant county, including any site-based B/ILT or SMR licenses. We seek comment on these eligibility restrictions, including whether any of the terms should be defined in greater detail.⁶⁶ We also seek comment on any other eligibility restrictions that may be necessary to ensure an efficient realignment process and to limit the amount of spectrum the Commission must license from inventory.

30. Our proposal to require the prospective broadband licensee to hold the licenses for all 20 geographically-licensed blocks of SMR spectrum and to return its 900 MHz holdings is designed to minimize the amount of spectrum the Commission must grant from inventory in order to create the 3/3 megahertz broadband license. In the current alignment of the 900 MHz band, the maximum amount of geographically-licensed SMR spectrum a licensee could hold in a given market is 5 megahertz (2.5 megahertz paired spectrum), which equals all 20 blocks of geographically-licensed SMR spectrum. The remaining 5 megahertz of spectrum in the 900 MHz band is either assigned to SMR or B/ILT site-based licenses or remains in Commission inventory. Our proposed realignment of the 900 MHz band, however, would allot a total of 6 megahertz of spectrum for the broadband segment (3/3 megahertz paired spectrum), and 4 megahertz of spectrum total for the narrowband segment. Therefore, even if the prospective broadband licensee successfully clears site-based incumbents from the broadband segment and returns its rights to all 20 blocks (5 megahertz) of SMR spectrum in exchange for spectrum in the broadband segment, the Commission would still need to grant an additional 1 megahertz of spectrum from Commission inventory to complete the 3/3 megahertz broadband license.⁶⁷ Our eligibility proposal therefore seeks to minimize the amount of spectrum the Commission grants from inventory to create such a license.

31. In certain markets, the Commission may currently hold some SMR inventory, such that the prospective broadband licensee could not hold all 20 geographically-licensed blocks of SMR spectrum. We seek comment on how to apply our proposed eligibility restriction in such cases. Should we decline to apply this process where the Commission would need to issue additional spectrum from inventory beyond the 1 megahertz already required to create a 3/3 broadband segment in any market? Or, where some geographic-area SMR licenses remain in Commission inventory, should we require the prospective broadband licensee to hold all the SMR licenses that have been issued, provided that it meets some minimum threshold of licenses? If so, what would be the appropriate minimum threshold to facilitate the voluntary exchange process in such markets while also mitigating the risk of an undue windfall to the prospective broadband licensee?

⁶⁴ See 47 CFR §§ 90.623, 90.627.

⁶⁵ The licensee must hold the rights to all spectrum associated with each of the 20 SMR blocks, i.e., a total of 5 megahertz.

⁶⁶ See, e.g., Letter from Elizabeth R. Sachs, Counsel to PDV, to Marlene H. Dortch, Secretary, FCC, WT Docket No. 17-200, at 1 (filed Mar. 5, 2019).

⁶⁷ As is the case in the majority of markets, this assumes the prospective broadband licensee does not hold any B/ILT or site-based SMR spectrum in addition to the 20 geographically-licensed SMR blocks. If the prospective broadband licensee also holds site-based licenses, then for every site-based channel that it could return to the Commission, the amount of spectrum the Commission would have to release from inventory to create a 3/3 megahertz broadband license would be reduced by 25 kilohertz.

32. Under our proposal, the prospective broadband licensee must either reach an agreement to clear, or demonstrate how it will provide interference protection to, all covered incumbents relating to the county for which it seeks a 3/3 megahertz broadband license. We propose to define “covered incumbents” as any site-based licensee that is required under current rules to be protected by the placement of a broadband licensee’s base station at any location within the county. Under existing 900 MHz co-channel separation requirements, co-channel systems must comply with a minimum spacing criteria of at least 113 kilometers (70 miles) separation distance between base stations.⁶⁸ The Commission’s rules also permit closer base station mileage separations through: (1) compliance with a specific mileage separation chart, which allows separation down to a minimum of 88 kilometers (55 miles) based on various base station height above average terrain/effective radiated power combinations; or (2) by agreement to lesser separation distances through the filing of concurrence letters from each affected co-channel licensee.⁶⁹ Under our proposal, the prospective broadband licensee would need to account for all covered incumbents in its Transition Plan (see paragraph 35 below) by demonstrating one or more of the following: (1) agreement by covered incumbents to relocate from the broadband segment, (2) protection of covered incumbents through compliance with minimum spacing criteria,⁷⁰ and/or (3) protection of covered incumbents through new or existing letters of concurrence agreeing to lesser base station separations.⁷¹ We seek comment on this approach.

33. In defining the incumbents that the prospective broadband licensee must relocate or protect, we seek to protect incumbents from potential interference that might result from the prospective broadband licensee’s co-channel operations, as well as ensure the prospective broadband licensee’s ability to make unencumbered use of its license. We seek comment on whether this is the appropriate criteria to adequately serve those goals. In the alternative, we seek comment on whether a different metric should be applied to defining “covered incumbent” for negotiation and relocation purposes that would also provide flexibility to locate base stations within a market, while still affording adequate interference protection to incumbent B/ILT systems. Are there better alternatives to relying on current fixed separation parameters? For example, should we require a prospective broadband licensee to demonstrate eligibility by clearing incumbents with a service or interfering contour that intersects the county boundary of the prospective broadband license? Commenters should discuss the costs and benefits of any alternative approach.

34. Our proposal is to implement a process where successful voluntary negotiations in a given market would result in band realignment and issuance of initial broadband licenses without the filing of mutually exclusive applications. If adopted, this approach could substantially increase the prospective broadband licensee’s spectrum value. We therefore seek comment on the risks that a prospective broadband licensee would realize an undue windfall in markets where a voluntary exchange is achieved, and we seek comment on what actions may be necessary to mitigate such risks. Should we require the new broadband licensee to offset the increase in value resulting from the creation of a contiguous band segment? Should we require the prospective broadband licensee to compensate the U.S. Treasury for the difference between the market value of the 3/3 megahertz broadband license and the total value of the SMR licenses it relinquishes, plus any costs it incurs to relocate incumbents from the broadband segment?⁷² We seek comment on whether these or any other anti-windfall provisions might be

⁶⁸ 47 CFR § 90.621(b). We note that this separation distance increases for certain high site locations in California and Washington. *See id.* § 90.621(b)(2), (3), and Short-Spacing Separation Table, n.1.

⁶⁹ *Id.* § 90.621(b)(4)-(5).

⁷⁰ *Id.* § 90.621(b)(4).

⁷¹ *Id.* § 90.621(b)(5).

⁷² We note that in realigning the 800 MHz band, the Commission used a “value for value” approach to determine the extent to which an entity should compensate the Commission for spectrum it receives in exchange for relocating incumbents and relinquishing rights in the realigned band. *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,

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appropriate in this proceeding. Further, we seek comment on how to quantify the public benefits of implementing a voluntary exchange option to repurpose the 900 MHz band for broadband use, in light of any potential windfall that might accrue to incumbents.

35. *Applications.* We propose that an application seeking a 900 MHz broadband license must include: (1) a certification that the applicant satisfies the eligibility restrictions (Eligibility Certification), and (2) a plan for transitioning the band in the particular county (Transition Plan) that describes the private agreements between the prospective broadband licensee and all covered incumbents. We propose that the Eligibility Certification must list the licenses the applicant holds for all 20 geographically-licensed SMR blocks, as well as the covered incumbents with which the applicant negotiated the Transition Plan for that county. We propose that the Transition Plan must describe in detail all information and actions necessary to accomplish the realignment, including: (1) the spectrum frequencies within the broadband segment that the prospective broadband licensee seeks from Commission inventory, (2) the rights to all 20 geographically-licensed SMR blocks, and any site-based SMR or B/ILT licenses in the county that the licensee is relinquishing, (3) the applications that the parties to the agreement will file for spectrum in the narrowband segment in order to relocate or repack licensees,⁷³ (4) a description of how the applicant will provide interference protection to, and/or relocate from the broadband segment, all covered incumbents, and (5) any rule waivers or other actions necessary to implement the agreement. If a prospective broadband licensee seeks to transition multiple counties simultaneously, we propose to allow the applicant to do so pursuant to a single Transition Plan that it would file with the application for each county covered by the Transition Plan.⁷⁴

36. We propose that the prospective broadband licensee may relocate covered incumbents into the narrowband segment. However, to ensure the Commission is made spectrally whole to the greatest extent possible by the prospective broadband licensee relinquishing all current 900 MHz rights in exchange for the new broadband license, we propose that the spectrum the prospective broadband licensee offers for the purposes of relocation may not exceed the incumbent's current spectrum holdings in the county, except where doing so is necessary to achieve equivalent coverage and/or capacity.⁷⁵ For example, if a B/ILT incumbent is currently operating on 5 channels of spectrum in the broadband segment, the prospective broadband licensee may offer the incumbent no more than 5 channels in the narrowband segment to effectuate relocation, unless additional channels are necessary to achieve equivalent coverage and/or capacity. This restriction, however, would not prohibit the prospective broadband licensee and covered incumbents from agreeing to relocate to less spectrum than the incumbent currently holds. For example, parties would be free to negotiate for other consideration—e.g., monetary payments, costs of relocation—in combination with, or in lieu of, relocation spectrum. We also seek comment on whether a requirement that incumbents transition from the current 12.5 kilohertz bandwidth to 6.25 kilohertz bandwidth would facilitate transactions to effectuate relocation. We propose that the Transition Plan must identify the specific

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19 FCC Rcd 14969 (2004), *review denied sub nom Mobile Relay Associates v. FCC*, 437 F.3d 1, 7 (D.C. Cir. 2006). Under that approach, the Commission first determined the market value of the new spectrum the entity (Nextel) would receive, and then provided for offsets against that value by giving Nextel credits for (1) the net value of relinquished spectrum rights, (2) the cost of 800 MHz band reconfiguration, and (3) costs incurred by Nextel to clear the band in which it received its new spectrum rights. *Id.* at 15081, para. 212. If, at the end of the band transition, those combined credits totaled less than the market value of the spectrum Nextel received, Nextel would be required to make a payment equal to the difference to the United States Treasury. *Id.* at 15123-23, para. 329.

⁷³ The necessary applications will not be filed until the Commission has granted the broadband license, but the Transition Plan should describe in detail the specific spectrum that will be covered by those applications and the type of application that will be necessary (e.g., modification of license relocating to new frequencies).

⁷⁴ The grant of such an application would result in separate licenses for each county covered by the Transition Plan.

⁷⁵ See, e.g., NextEra March 8, 2019 *Ex Parte* Letter at 4; NextEra March 6, 2019 *Ex Parte* Letter, Attach. at 6; Letter from Kevin M. Cookler, Counsel to LCRA, to Marlene H. Dortch, Secretary, FCC, WT Docket No. 17-200, at 3 (filed Mar. 6, 2019).

frequencies in the narrowband segment where covered incumbents seek to relocate. We would lift the freeze on B/ILT applications to allow incumbents to file applications necessary to effectuate relocation. We seek comment on this proposal.

37. We reiterate that this proposal is intended to rely on purely voluntary mechanisms for realigning the 900 MHz band. An applicant will only be able to acquire a license for the new 3/3 megahertz broadband segment in a county where it either has reached an agreement to voluntarily relocate, or has demonstrated how it will provide interference protection to, all covered incumbents. This market-driven approach permits the prospective broadband licensee and covered incumbents to negotiate the specific terms of their Transition Plan (e.g., payment of relocation costs, replacement facilities, administrative duties). Unless the prospective broadband licensee agrees to protect incumbents from interference, all covered incumbents must agree to clear, and each will therefore have an incentive to holdout for a larger share of the gains than it individually contributes. We seek comment on our proposal and what, if any, additional requirements may be necessary to ensure an efficient and complete transition process.

38. In other contexts, the Commission has addressed the holdout problem through mandatory relocation. However, many commenters have expressed concern about the costs and disruptions to existing operations that could result from such mandatory relocation.⁷⁶ In addition, we emphasize that our proposal to effectuate a 900 MHz band realignment through market-driven voluntary relocation is intended to facilitate faster broadband deployment in this band, relative to other possible approaches, in markets where a voluntary exchange is achievable. Would requiring mandatory relocation as a component of this transition mechanism be an effective means of mitigating against holdouts, while also preserving the advantages of a purely voluntary and market-driven approach? For example, once the threshold for voluntary exchanges has been met by the prospective broadband licensee, the FCC could require mandatory relocation for the remaining incumbent(s) except for those with complex systems, which could be defined as systems with 65 or more integrated 900 MHz sites. Such mandatory relocation might be applied to remaining incumbents without complex systems if, during the first year of negotiation, the prospective broadband licensee reaches agreement with or demonstrates protection to entities controlling 90% of the channels within the 900 MHz Broadband Service. The number could be reduced to 80% during a second year of voluntary negotiation. We seek comment on this approach. We also seek comment on whether incumbent site-based licensees would be unduly burdened by the imposition of a mandatory relocation requirement.⁷⁷ Should we limit any mandatory relocation to counties where the prospective broadband licensee holds more than 3 megahertz uplink and 3 megahertz downlink in the 900 MHz band (across the county including both SMR and site-based licenses) and, if so, how should we calculate the site-based spectrum holdings? We seek comment on these issues, as well as the costs and benefits of any other approach commenters support for addressing the holdout problem.

39. *Procedures.* We propose to commence the voluntary exchange process by issuing a public notice opening a filing window to accept applications consistent with the proposed eligibility and application requirements. Because the voluntary exchange process is an initial solution that may not result in clearing of a 3/3 broadband segment in all markets, potentially requiring supplemental transition methods, the Commission may ultimately implement an overlay or incentive auction in those areas where the process does not result in realignment of the band. We therefore seek comment on whether the filing window should be open indefinitely, or whether the Commission should designate some period of time by which any qualifying applications must be filed. Would creating a finite window help to encourage negotiations and curtail holdout problems? If so, what period of time would be sufficient to allow incumbents to complete negotiations and develop an agreement to transition the band? Conversely, if the

⁷⁶ See, e.g., NextEra Comments at 6-10; LCRA Comments at 7-10; CIC Comments at 9-13; EEI Comments at 13-15.

⁷⁷ See, e.g., Letter from Elizabeth R. Sachs, Counsel to PDV, to Marlene H. Dortch, Secretary, FCC, WT Docket No. 17-200, at 1 (filed Mar. 7, 2019).

window is undefined, should the Commission provide notice prior to closing the window in those areas where voluntary transition is not successful? If so, how much prior notice would be sufficient for incumbents with pending negotiations to finalize an agreement and make the necessary filings? We seek comment on these and any other issues relating to the application filing window.

40. Consistent with the Commission's Part 1 rules, applications for a new 900 MHz broadband license would be placed on public notice for 30 days, during which time interested parties may file petitions to deny.⁷⁸ After review of the required filings, if the Commission finds that the applicant has satisfied the eligibility restrictions and application requirements discussed in this section and that grant of the application is otherwise in the public interest, it would grant the application and issue a 3/3 broadband segment license. Upon grant, we would lift the freeze on B/ILT applications to allow incumbents to file applications necessary to effectuate relocation. We propose that, notwithstanding the presence of incumbents in the broadband segment requiring clearing by agreement, the timeline for complying with the applicable construction obligations will commence upon the Commission's grant of the new license.

2. An Auction of Overlay Licenses

41. We recognize that a market-driven voluntary exchange process may not result in agreement to relocate all incumbents necessary to provide sufficient contiguous spectrum for broadband services, particularly in markets with heavy B/ILT use. Therefore, we seek comment on whether an auction of overlay 900 MHz broadband licenses, coupled with the right to mandatorily relocate narrowband incumbents in the entire band, might be a viable alternative method in certain markets to ensure adequate access to broadband spectrum.

42. Under this approach, the Commission would conduct, where appropriate, an auction of a single 3/3 megahertz overlay license in a geographic area (e.g., county or other area which the Commission finds most suitable for this transition method). In many narrowband services, the Commission has conducted an auction of overlay licenses while requiring the auction winner to fully protect incumbent operations in the band.⁷⁹ In the 900 MHz band, with its intense spectrum usage in many markets, there may be incumbent licensees with less interest in voluntarily relocating to avoid any disruption to their operations or that present excessive economic or technical demands. Permitting protected co-channel incumbent operations in a market could potentially result in insufficient contiguous spectrum to enable provision of new broadband services, thereby undermining the goals of this proceeding. Accordingly, under this approach, the winning bidder would be entitled to require incumbents to relocate to narrowband frequencies outside the 3/3 broadband segment, provided it pays for appropriate relocation costs as discussed below. We would lift the freeze on B/ILT applications to allow incumbents to file applications necessary to effectuate relocation. We seek comment on this alternative approach, particularly the costs and benefits associated with implementation.

43. As part of the overlay licensee's relocation rights and to facilitate successful incumbent relocation, the overlay broadband licensee would have the right to access all unassigned spectrum throughout the entire 900 MHz band in its licensed geographic area(s), including spectrum outside the 3/3 megahertz broadband segment. Unassigned channels could be used not only for relocation of incumbents from the broadband segment, but also for repacking incumbents currently located in the two narrowband segments. This arrangement would allow the overlay broadband licensee to better repack incumbent licensees within the entire 900 MHz band. However, if the overlay broadband licensee cannot or chooses

⁷⁸ 47 CFR §§ 1.933(b), 1.939.

⁷⁹ For example, this approach was implemented in the 220 MHz service, Paging and Radiotelephone Service and 800 MHz Specialized Mobile Radio Service. *See Auction of Phase II 220 MHz Spectrum Scheduled for June 20, 2007*, Public Notice, 21 FCC Rcd 14305, 1406-07, para. 5 (2006); *Revision of Part 22 and Part 90 of the Commission's Rules to Facilitate Future Development of Paging Systems*, Memorandum Opinion and Order on Reconsideration and Third Report and Order, 14 FCC Rcd 10030, 10059-60, paras. 42-44 (1999); *Auction of 800 MHz Specialized Mobile Radio Service Licenses*, Public Notice, 13 FCC Rcd 1875, 1877 (1997).

not to relocate an incumbent out of the broadband segment, it would be required to protect the operation of such incumbent on an indefinite basis. We seek comment on this approach.

44. Alternatively, to allow maximum flexibility to the overlay licensee, should the Commission consider conducting an auction of a single 5/5 megahertz overlay license in each market? This would allow an overlay licensee to deploy broadband anywhere in the band, subject to protecting any remaining incumbents, and to provide incentives for efficient repacking, but it would have the disadvantage that the Commission would not retain any spectrum for future B/ILT licensing. We seek comment on this alternative approach.

45. Under the auction of either a 3/3 or 5/5 megahertz overlay license approach, we seek comment on establishing a framework for compensating relocated incumbents. Should we require that overlay licensees provide mandatorily relocated incumbents with “comparable facilities,” as the Commission has required in other bands? Specifically, we seek comment on the extent to which the rules governing 800 MHz rebanding⁸⁰ would be appropriate for relocation in the 900 MHz band, or whether other relocation methodologies are more appropriate. Should we adopt various stages for negotiations with specific timeframes for each, as was done in the 800 MHz rebanding context? How should a mandatory relocation be managed in each license area and to what extent should the Commission be involved in the process? Should the Commission give the overlay broadband licensee the flexibility to effectuate the relocation and if so, how would disputes be adjudicated and should mediation be an available option? We seek comment on the costs, benefits, advantages and disadvantages of these various approaches.

46. We also seek comment on the appropriate overall time frame for mandatory relocation and how the Commission should proceed after its completion. We anticipate that after the expiration of the mandatory relocation period, any unassigned spectrum in the two narrowband segments should be returned to the Commission’s inventory. This would permit the Commission to resume licensing of the unassigned narrowband B/ILT 900 MHz spectrum to B/ILT eligible entities. Would a 2-year period for mandatory relocation be appropriate, or should the Commission consider a shorter or longer time frame?

47. Lastly, we seek comment on the most appropriate auction approach in light of any issues that may arise where an SMR incumbent has substantial spectrum holdings in a licensing area. We seek comment on whether the presence of an SMR incumbent that holds substantial spectrum in a licensing area could discourage competition for that area in the auction of an overlay broadband license or whether that incumbent unilaterally could prevent another entity from clearing the broadband segment. One auction design solution to this problem is to use a sealed bid auction or to allow for a final sealed bid round at the end of a multi-round auction. Are there any other issues we should consider pertaining to the quantity of spectrum holdings held by any incumbents? Are there any auction design approaches the Commission could implement to address such issues?

3. An Incentive Auction

48. We understand that neither the market-driven relocation process nor the auction of overlay licenses guarantees clearing of sufficient usable spectrum for broadband services in the 3/3 megahertz segment. Therefore, we also seek comment on whether the Commission should consider using its incentive auction authority to reduce encumbrances in the 900 MHz band.⁸¹ Under an incentive auction approach, the Commission would create a single 3/3 megahertz broadband license in each market by offering incentive-payments to existing MTA licensees in exchange for relinquishing spectrum usage rights, while also repacking site-based and any holdout MTA licensees. Similar to our approach in the 39 GHz band, incumbents with MTA licenses would be offered incentive payments in the form of vouchers in exchange for a commitment to relinquish their licensed spectrum usage rights. Accepting vouchers

⁸⁰ See, e.g., 47 CFR § 90.699.

⁸¹ See 47 U.S.C. § 309(j)(8)(G).

would be voluntary, however, and any MTA licensees participating in the auction for the broadband license would be required to commit to accepting vouchers for all their current licenses.⁸² In addition, any incumbent that wishes to bid for new licenses offered at auction would be required to relinquish all of its existing licenses for vouchers. The Commission would then run a clock auction to set both the price of new county-level broadband licenses and the amounts that incumbents will receive for relinquishing their MTA licenses.⁸³ This single clock auction would simultaneously serve as the reverse and forward components of the incentive auction. At the end of the auction, the value of an incumbent's vouchers would be determined by the MHz-pops of spectrum usage rights relinquished and the price per unit of spectrum in the market as determined in an auction for the broadband license. Thus, an incumbent that wishes to retain licenses in specific geographic areas could bid in the auction for new licenses in those geographic areas—and win—without making an additional payment because incentive payments will be based on the clock price of new licenses determined by the auction.⁸⁴

49. Since site-based B/ILT licenses are currently interleaved with SMR licenses within the proposed broadband segment, the incentive auction would require site-based incumbent licensees to be repacked into the narrowband segments. All site-based incumbents (both within and outside the broadband segment) would be repacked simultaneously with the objective of minimizing the total number of channels required for these licensees to operate. Under this option, newly created vacant channels would be available to repack non-participating MTA licensees and to create the broadband license. If the repacking plan determines that there is insufficient spectrum to create a 3/3 megahertz broadband license, site-based licensees would be offered vouchers in exchange for a commitment to relinquish licenses. We seek comment on this alternative transition mechanism.

50. We also seek comment on whether to reimburse any costs of relocating existing incumbents and, if so, how significant those costs likely would be. We note that these costs may be relatively low given that equipment is interoperable across the entire band and would therefore only require incumbents to retune their existing radio equipment. We seek comment on the likely magnitude of these costs and how we should quantify them. Also, if commenters believe reimbursement costs should be paid, we seek comment on whether we have statutory authority to make such payments and how these payments should be calculated and disbursed among the incumbents. For example, should reimbursements be made on a per-site basis or is there a better metric for determining likely retuning costs? Should we impose these costs instead on new broadband licensees as a condition of their new licenses, as we have proposed in proceedings introducing other new services?⁸⁵

51. While the value of the incentive payments received for vouchers issued to site-based

⁸² As noted in the *Spectrum Frontiers Fourth Report and Order*, the Communications Act authorizes the Commission to use an incentive auction to encourage licensees to relinquish their spectrum usage rights voluntarily provided that at least two bidders compete to relinquish existing rights. *Use of Spectrum Bands Above 24 GHz For Mobile Radio Services*, Report and Order, FCC 18-180, para. 9 (Dec. 12, 2018), 2018 WL 6589804 (*Spectrum Frontiers Fourth Report and Order*). We first addressed this requirement in the broadcast incentive auction, where we concluded that the requirement would be met as long more than one non-commonly controlled party qualifies as an applicant to participate and compete for incentive payments from the proceeds from the auction, and we reserved the discretion to apply the requirement differently depending on the particular context. See *Incentive Auction Report and Order*, 29 FCC Rcd at 6742-43, paras. 413-414. Consistent with our conclusion in the *Spectrum Frontiers Fourth Report and Order*, we conclude that we would conduct such an incentive auction only if there are at least two competing incumbent participants. *Spectrum Frontiers Fourth Report and Order*, FCC 18-180, para. 9.

⁸³ While we seek comment on whether any new broadband licenses should be issued at the county-level in the event we implement an incentive auction transition mechanism using counties, we note that counties nest within MTAs, so under this approach, the total value of an MTA SMR license would be calculated by summing the county-level values as determined by the forward auction.

⁸⁴ See *Spectrum Frontiers Fourth Report and Order*, FCC 18-180, para. 10.

⁸⁵ See, e.g., *Mid-Band NPRM*, 33 FCC Rcd at 6926-27, para. 29.

licensees would be determined by the clock price of the incentive auction, we seek comment on how to quantify the existing spectrum usage rights for purposes of offering vouchers to incumbents that do not hold geographic licenses in cases where such offers are required to achieve a 3/3 megahertz broadband license. One approach would be to allocate the total spectrum made available among all the incumbents that agree to relinquish their licenses in proportion to their contribution. For example, a site-based incumbent could receive vouchers equal to the total spectrum made available multiplied by the ratio of the number of sites they are no longer operating to the total number of B/ILT sites that agree to discontinue service. A second possibility would be to calculate the MHz-pops encumbered by a site-based license and award the licensee a voucher equal to this amount. We seek comment on these and other possible approaches for determining the quantity of spectrum usage rights voluntarily relinquished by site-based licensees should it be necessary to have them do so.

52. Under this approach, the broadband license auction would use a clock auction design with rules similar to those used for the forward auction in the broadcast incentive auction and the Commission's upcoming 24 GHz auction.⁸⁶ The clock auction format would proceed in a series of rounds, with simultaneous bidding for all the county broadband licenses. In each round, the auction would announce prices for each county license, and qualified bidders would indicate whether they are willing to purchase the county license at that clock price. Bidders would be subject to activity and eligibility rules that govern the pace at which they participate in the auction. In each county, the clock price for the license would increase from round to round if bidders indicate total demand that exceeds one license. If supply is equal to demand in a county, a bidder would not be permitted to create "excess supply" by reducing its demand for the broadband license. The clock rounds would continue until, for every county license available, the number of licenses demanded was less than or equal to one. At that point, those bidders indicating demand for a county license at the final clock phase price would be deemed winning broadband license bidders.

53. Following the auction, the processing of voucher payments for each incumbent licensee would depend on whether the spectrum offered in the reverse auction was needed in the forward broadband license auction. In counties where demand at the end of the forward auction equaled supply, the Commission would cancel the participating incumbents' licenses and make payments equal to the product of the final clock price and the MHz-Pops of spectrum relinquished by the incumbent. In counties where there was no demand for the broadband license, we propose that incumbents would retain their existing spectrum usage rights and would receive no payments for their vouchers. To minimize the disruption to existing services, we further propose in this case that incumbent licensees would not be repacked since spectrum in these markets is unlikely to be sufficiently scarce to justify the cost of the repack. Alternatively, the Commission could pay for all vouchers and/or repack incumbents in every county regardless of the demand for a broadband license. We seek comment on these and alternative approaches to implementing voucher payments and repacking incumbents.

54. We next need to address the method for ensuring that the forward auction for broadband licenses will generate sufficient revenues to pay for all reimbursed vouchers and incumbent relocation costs, should it be necessary and possible to make such payments. In the broadcast incentive auction, the Commission adopted a "final stage rule" to ensure that auction proceeds would be sufficient to cover costs, and in other auctions the Commission has adopted aggregate reserve prices to fund the estimated

⁸⁶ See *Auctions of Upper Microwave Flexible Use Licenses for Next-Generation Wireless Services; Comment Sought on Competitive Bidding Procedures for Auctions 101 (28 GHz) and 102 (24 GHz); Bidding in Auction 101 Scheduled to Begin November 14, 2018*, Public Notice, 33 FCC Rcd 4103 (2018). As in those auctions, we would implement our Part 1 general competitive bidding rules to develop detailed final auction procedures in advance of the start of bidding, through a "pre-auction process," which includes soliciting public input on proposed procedures in a "Comment Public Notice" and resolving those issues in a "Procedures Public Notice." See *Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions*, Report and Order, 29 FCC Rcd 6567, 6574, para. 15 (2014) (*Incentive Auctions Report and Order*).

relocation costs. In part, the rule in the broadcast incentive auction implemented a net revenue requirement for the auction that accounted for any bidding credits, relocation expenses, and incentive payments. Under such a net revenue requirement, the auction would not close unless auction proceeds are sufficient to cover all required payments. We seek comment on whether the Commission should establish such a net revenue requirement. Under this approach, the Commission would establish procedures implementing such a net revenue requirement should we proceed with an incentive auction in this band. We seek comment on this approach, and on any other appropriate closing conditions applicable to any or all geographic areas.

55. We seek comment on the potential advantages and disadvantages of each of the three proposals. Would the voluntary private exchange require fewer rulemakings, potentially reducing the time to create an unencumbered broadband license or would transactions costs and holdout problems likely negate this potential benefit? Under the overlay license proposal, could an incumbent with most of the SMR licenses in an area discourage any other parties from bidding because of the potential difficulty of any other party clearing that incumbent? Would the incentive auction approach, by clearing incumbents before auctioning broadband licenses, better allow for any entity to bid for the broadband license in a geographic market? Would the incentive auction more rapidly transition the band due to the elimination of multiple negotiations, holdout problems and the need to determine how best to repack incumbents? Would the complexity of repacking under the incentive auction approach outweigh the benefit of clearing more spectrum and maximizing the amount of spectrum retained for future narrowband licensing? We seek comment on these and other benefits and costs of the three alternative approaches.

C. Licensing and Operating Rules

56. We propose to designate the 900 MHz broadband service as a Miscellaneous Wireless Communications Service governed by Part 27 of the Commission's rules. Broadband licensees in the 900 MHz broadband segment would be required to comply with licensing and operating rules that are applicable to all Part 27 services, including foreign ownership reporting,⁸⁷ renewal criteria,⁸⁸ permanent discontinuance of operations,⁸⁹ partitioning and disaggregation,⁹⁰ and spectrum leasing.⁹¹ We seek comment on this approach and ask commenters to identify any aspects of our general Part 27 service rules that should be modified to accommodate the characteristics of the proposed 900 MHz broadband segment. As set forth below, we also propose to adopt service-specific rules for the 900 MHz broadband segment, in addition to requirements that apply generally to Part 27 licensees. Commenters should discuss the costs and benefits associated with the following proposals and any alternatives. In the alternative, we ask commenters to address whether 900 MHz broadband licenses should be regulated under Part 90 of our rules so that broadband licensees and narrowband incumbents in the 900 MHz band would be operating under a single set of rules. Commenters favoring this approach should identify the Part 90 rules that would need to be amended and suggest specific rule language.

⁸⁷ 47 U.S.C. § 310; 47 CFR § 1.5000 *et seq.*

⁸⁸ 47 CFR § 1.949. We note the Commission recently amended several of the rules applicable to various geographically-licensed wireless radio services. See *Amendment of Parts 1, 22, 24, 27, 74, 80, 90, 95, and 101 To Establish Uniform License Renewal et al.*, Second Report and Order and Further Notice of Proposed Rulemaking and Order, 32 FCC Rcd 8874 (2017) (*WRS Renewal Reform 2nd R&O and FNPRM*). The *WRS Renewal 2nd R&O and FNPRM* adopted a unified framework for construction, renewal, and service continuity rules for flexible-use geographic licenses in the Wireless Radio Services. We note that the rule the Commission adopted to address construction obligations resulting from partition and disaggregation – 47 CFR § 1.950 – is pending approval from the Office of Management and Budget.

⁸⁹ 47 CFR § 1.953.

⁹⁰ *Id.* § 1.950.

⁹¹ *Id.* § 1.9001 *et seq.*

57. *Eligibility.* As discussed in Section III.B.1, in the event the Commission adopts a voluntary exchange process for transitioning the 900 MHz band, we propose specific eligibility restrictions for a new 3/3 megahertz broadband license. Alternatively, if the Commission adopts an overlay or incentive auction approach for realigning the band, consistent with the Commission's approach to date toward flexible use geographic licensing, we seek comment on adopting an open eligibility standard for such licenses in the 900 MHz broadband segment. The Commission has determined with respect to a number of services that eligibility restrictions on licenses should be imposed only when open eligibility would pose a significant likelihood of substantial harm to competition in specific markets and when an eligibility restriction would be effective in eliminating that harm.⁹² Would adopting an open eligibility standard for the licensing of 900 MHz broadband spectrum through competitive bidding, where appropriate, encourage efforts to develop new technologies, products, and services, while helping to ensure efficient use of this spectrum?⁹³ Commenters should discuss the costs and benefits of the open eligibility proposal on competition, innovation, and investment.

58. *Mobile spectrum holdings policies.* Spectrum is an essential input for the provision of wireless services, and the Commission has developed policies to ensure that spectrum is assigned in a manner that promotes competition, innovation, and efficient use.⁹⁴ We seek comment generally on whether and how to address any mobile spectrum holdings issues involving 900 MHz broadband spectrum to meet our statutory requirements and to ensure competitive access to the band. We note that the broadband segment of 3/3 megahertz is less than what the Commission has designated for other flexible-use broadband services in the past, and use of this segment is likely to be focused on business, enterprise, and government customers whose needs are not being met by the consumer-driven, wireless service offerings. Given these characteristics, we are not inclined to include the 900 MHz broadband segment in the Commission's spectrum screen, which helps to identify markets that may warrant further competitive analysis when evaluating proposed secondary market transactions.⁹⁵ Commenters advocating for inclusion of the 900 MHz broadband segment in the screen should address specifically the suitability of this spectrum for use in the provision of mobile telephony/broadband services. Commenters should further discuss and quantify the costs and benefits of any proposals to apply mobile spectrum holdings policies to the proposed 900 MHz broadband segment.

59. *License term.* Part 27 licenses vary in length.⁹⁶ For some broadband licenses, the Commission has adopted longer terms,⁹⁷ particularly where, as here, the licensee would face "relocation

⁹² See, e.g., *Service Rules for Advanced Wireless Services in the 2000-2020 MHz and 2180-2200 MHz Bands*, Report and Order and Order of Proposed Modification, 27 FCC Rcd 16102, 16193, paras. 241-42 (2012); *Service Rules for the 698-746, 747-762 and 777-792 MHz Bands*, Second Report and Order, 22 FCC Rcd 15289, 15381, 15383-84, paras. 253, 256 (2007); *Allocations and Service Rules for the 71-76 GHz, 81-86 GHz and 92-95 GHz Bands*, Report and Order, 18 FCC Rcd 23318, 23346-47, para. 70 (2003).

⁹³ See 47 U.S.C. § 309(j)(3). We note that an open eligibility approach would not affect citizenship, character, or other generally applicable qualifications that may apply under our rules. See *id.* §§ 301, 308(b), 310.

⁹⁴ The Communications Act requires the Commission to examine closely the impact of spectrum aggregation on competition, innovation, and the efficient use of spectrum to ensure that spectrum is assigned in a manner that serves the public interest, convenience, and necessity. See 47 U.S.C. §§ 303(g), 307, 308(b), 309(a).

⁹⁵ The Commission's spectrum screen for evaluating proposed secondary market transactions includes a number of spectrum bands used to provide mobile wireless services directly to consumers, such as the cellular, PCS, 600 MHz, 700 MHz, and Advanced Wireless Service bands. For a description of the spectrum screen, see *Communications Marketplace Report et al.*, FCC 18-181, 2018 WL 6839365 at para. 32, Figure A-23 (rel. Dec. 26, 2018), <https://docs.fcc.gov/public/attachments/FCC-18-181A1.pdf>.

⁹⁶ 47 CFR § 27.13.

⁹⁷ See, e.g., *Amendment of the Commission's Rules with Regard to Commercial Operations in the 1695-1710 MHz, 1755-1780 MHz, and 2155-2180 MHz Bands*, Report and Order, 29 FCC Rcd 4610, 4658, para. 132 (2014) (*AWS-3*

and band clearance issues.⁹⁸ We propose to adopt a 15-year term for licenses in the 900 MHz broadband spectrum.⁹⁹ We seek comment on the costs and benefits of this proposal. In addition, we seek comment on whether and to what extent we should adopt shorter terms for subsequent renewal terms, given that relocation, band clearance, and initial performance requirements already will have been satisfied upon renewal of a given 900 MHz broadband license.¹⁰⁰ We invite commenters to submit alternate proposals for the appropriate license term, which should similarly include a discussion of the costs and benefits.

60. *Performance requirements.* The Commission typically establishes performance requirements to ensure that spectrum is intensely and efficiently utilized, and it has applied different performance and construction requirements to different spectrum bands based on considerations relevant to those bands.¹⁰¹ We continue to believe that performance requirements play a critical role in ensuring that licensed spectrum does not lie fallow. Accordingly, to ensure that licensees begin providing service to consumers in a timely manner, we seek comment on adopting quantifiable benchmarks in the proposed broadband segment. Specifically, we seek comment on requiring a 900 MHz broadband licensee to provide reliable signal coverage and to offer service to at least 45 percent of the population in each of its license areas within six years of the license issuance date (first performance benchmark), and to at least 80 percent of the population in each of its license areas within 12 years from the license issue date (second performance benchmark). We note that the period for complying with these performance requirements would begin on the date that the license is issued, irrespective of the extent to which the broadband licensee is able to successfully relocate existing licensees out of the 3/3 megahertz segment. We believe that 12 years from the date of license issuance will provide sufficient time for any 900 MHz broadband licensee to meet the proposed coverage requirements. After satisfying the 12-year, second performance benchmark, a licensee will be expected to continue to provide reliable signal coverage and offer service at or above that level for the remaining three years in the proposed 15-year license term in order to warrant license renewal.¹⁰² Establishing benchmarks before the end of the license term will ensure continuity of service over the license term, which is essential to our evaluation under the Commission's renewal standards.

61. We also seek comment on whether the proposals discussed above represent the appropriate balance between license-term length and a significant final buildout requirement. We seek comment on the proposed buildout requirements and any potential alternatives. For example, given the

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Report and Order) (adopting 12-year term for AWS-3 licenses); *see also Mid-Band NPRM*, 33 FCC Rcd at 6964, para. 149 (seeking comment on 15-year license term).

⁹⁸ *AWS-1 Service Rules Order*, 18 FCC Rcd at 25190, para. 70 (adopting an initial license term of 15 years for AWS-1 licenses).

⁹⁹ The Communications Act does not specify a term limit for wireless radio services licenses. The only statutory limit on license terms is eight years for licenses in the broadcast services. *See* 47 U.S.C. § 307(c)(1); *see also* 47 CFR § 73.1020(a).

¹⁰⁰ *See, e.g.*, 47 CFR § 27.14(k) (AWS-3 licenses have a 12-year initial license terms and 10-year renewal terms), (l) (600 MHz band licenses have 12-year initial license terms and 10-year renewal terms).

¹⁰¹ *See, e.g., Service Rules for Advanced Wireless Services H Block—Implementing Section 6401 of the Middle Class Tax Relief and Job Creation Act of 2012 Related to the 1915-1920 MHz and 1995-2000 MHz Bands*, Report and Order, 28 FCC Rcd 9483, 9558-59, para. 195 (2013); *see also AWS-3 Report and Order*, 29 FCC Rcd at 4659-60, para. 135; *Incentive Auctions Report and Order*, 29 FCC Rcd at 6877-78, para. 764. For auctioned services, the Act requires that the Commission's rules include "performance requirements, such as appropriate deadlines and penalties for performance failures, to ensure prompt delivery of service to rural areas, to prevent stockpiling or warehousing of spectrum by licensees or permittees, and to promote investment in and rapid deployment of new technologies and services." 47 U.S.C. § 309(j)(4)(B).

¹⁰² *See WRS Renewal Reform 2nd R&O and FNPRM*, 32 FCC Rcd at 8886-89, paras. 27-34 (adopting continuity of service and other renewal showing requirements for WRS licensees).

potential use of the 900 MHz broadband segment by private wireless users such as electric utilities or other B/ILT eligibles, we seek comment on what alternative metrics would be necessary, if any, to accommodate such users.¹⁰³ Should we adopt specific performance requirements tailored to account for use of the spectrum for private business purposes? We also seek comment on whether small entities face any special or unique issues with respect to buildout requirements such that they would require certain accommodations or additional time to comply. Finally, commenters should discuss and quantify how any proposed buildout requirements will affect investment and innovation, as well as discuss and quantify other costs and benefits associated with the proposal.

62. A prospective broadband licensee may have previously constructed facilities for site-based and/or geographic-area narrowband operations pursuant to its construction obligations under existing 900 MHz rules. Our voluntary exchange proposal for realigning the band would allow an eligible incumbent SMR licensee to exchange its holdings across non-contiguous narrowband segments for the rights to 3/3 megahertz of contiguous spectrum newly authorized for mobile use. Accordingly, to achieve our policy goals of reconfiguring the 900 MHz band specifically to enable broadband operations, we propose to require 900 MHz broadband licensees to deploy broadband technologies and offer broadband services in satisfying the proposed performance requirements. We seek comment on how to define broadband services for the purposes of this obligation. We recognize that many broadband services are commonly delivered over 5-, 10-, or 20-megahertz bandwidths and therefore seek comment on the appropriate definition of broadband services given the comparatively limited bandwidth of a 3/3 megahertz band segment.

63. We also seek comment on whether to similarly apply a broadband deployment requirement if the Commission uses an incentive or overlay auction to transition the 900 MHz band. Alternatively, depending on the transition mechanism the Commission adopts, should we apply a more general flexible use standard to the proposed performance requirements? For example, should we provide 900 MHz broadband licensees the flexibility to provide other narrowband services such as narrowband-Internet of Things (NB-IoT)? We note that NB-IoT services and other CII-related uses may be potentially less suited to a population-coverage metric, and licensees that wish to provide such services may benefit from an alternative performance benchmark metric. We seek comment on the appropriate metric to accommodate such service offerings, such as a performance metric based on geographic-area coverage (or presence in a license area).¹⁰⁴ We also seek comment on these coverage metrics and any alternative levels of coverage that might be appropriate, including the costs and benefits of the coverage metrics discussed and any alternatives.

64. *Penalty for failure to meet performance requirements.* In conjunction with performance benchmarks, we seek to adopt clear and enforceable penalties for failing to meet those benchmarks. We propose that, in the event a 900 MHz broadband licensee fails to meet the first performance benchmark, the licensee's second benchmark and license term would be reduced by two years, thereby requiring it to meet the second performance benchmark two years sooner (i.e., at 10 years into the license term) and reducing its license term to 13 years. We further propose that, in the event a 900 MHz broadband licensee fails to meet the second performance benchmark for a particular license area, its authorization for that license area shall terminate automatically without Commission action.

65. We propose that, in the event a licensee's authority to operate terminates, the licensee's spectrum rights would become available for reassignment pursuant to the competitive bidding provisions of section 309(j) of the Communications Act (if we assign 900 MHz broadband licenses through competitive bidding). Further, consistent with the Commission's rules for other broadband licenses, we

¹⁰³ See, e.g., Letter from Brett Kilbourne, General Counsel and VP of Policy, UTC, to Marlene H. Dortch, Secretary, FCC, WT Docket No. 17-200, at 1 (filed Mar. 9, 2019).

¹⁰⁴ As indicated above, licensees like electric utilities and other B/ILT entities that use the service for private business purposes may also require alternative performance benchmark metrics.

propose that any 900 MHz broadband licensee that forfeits its license for failure to meet its performance requirements would be precluded from regaining that license.¹⁰⁵ Finally, we seek comment on other penalties that would effectively ensure timely buildout.

66. *Competitive bidding procedures.* As discussed above, if we adopt a geographic area licensing scheme that allows acceptance of mutually exclusive applications for 900 MHz broadband licenses, then, consistent with our statutory mandate, we will grant the licenses through a system of competitive bidding.¹⁰⁶ As the Commission has done in previous auctions, we propose to conduct any auction for 900 MHz broadband licenses in conformity with the general competitive bidding rules set forth in Part 1, subpart Q, of the Commission's rules.¹⁰⁷ Under this proposal, such rules would be subject to any modifications that the Commission may adopt for its Part 1 general competitive bidding rules in the future.¹⁰⁸ We seek comment on general application of the Part 1 competitive bidding rules to any auction of 900 MHz broadband spectrum licenses. We also seek comment on whether any of our Part 1 rules or other competitive bidding policies would be inappropriate or should be modified for an auction of licenses in this band. We seek comment on the costs and benefits of these proposals.

67. We seek comment on whether to make bidding credits for designated entities available for this band. We also seek comment on how to define a small business if we decide to offer small business bidding credits. In recent years, for other flexible use licenses we have adopted bidding credits for the two larger designated entity business sizes provided in the Commission's Part 1 standardized schedule of bidding credits.¹⁰⁹ Consistent with our approach in these other services, for the 900 MHz broadband spectrum, we seek comment on defining a small business as an entity with average gross revenues for the preceding three years not exceeding \$55 million, and a very small business as an entity with average gross revenues for the preceding three years not exceeding \$20 million. A qualifying "small businesses" would be eligible for a bidding credit of 15 percent and qualifying "very small businesses" would be eligible for a bidding credit of 25 percent. We also seek comment on whether to offer rural service providers a designated entity bidding credit for licenses in this band.¹¹⁰ Commenters addressing

¹⁰⁵ See, e.g., 47 CFR § 27.14(a) (AWS-1 and AWS-3), (q)(6) (AWS-4), (r)(4) (H Block).

¹⁰⁶ See 47 U.S.C. § 309(j)(1).

¹⁰⁷ See 47 CFR §§ 1.2101-1.2114.

¹⁰⁸ In its most recent amendments to the Part 1 competitive bidding rules, the Commission, among other things, updated the standardized schedule of small business size standards, instituted a rural service provider bidding credit, and adopted a process by which we may establish a reasonable monetary limit or cap on the total amount of bidding credits that an eligible small business or rural service provider may be awarded in a particular auction. *Updating Part 1 Competitive Bidding Rules*, Report and Order, 30 FCC Rcd 7493, 7530-31, para. 88, 7539-48, paras. 109-30 (2015) (*Updating Part 1 R&O*).

¹⁰⁹ See *Incentive Auctions Report and Order*, 29 FCC Rcd at 6761-63, paras. 473-75; *Updating Part 1 R&O*, 30 FCC Rcd at 7524-25, para. 74, 7528, para. 83 (adopting revised small business size standards for auctions of licenses in the 600 MHz Band); *Spectrum Frontiers Report and Order*, 31 FCC Rcd at 8099-8100, paras. 249-50 (adopting small business size standards for auctions of licenses in the Upper Microwave Flexible Use Service); 47 CFR § 1.2110(f)(2)(i)(A) (businesses with average gross revenues for the preceding 3 years not exceeding \$4 million may be eligible for a bidding credit of 35 percent), (B) (bidding credit of 25 percent for businesses with average gross revenues for the preceding 3 years not exceeding \$20 million), (C) (bidding credit of 15 percent for businesses with average gross revenues for the preceding 3 years not exceeding \$55 million). While the Commission is not required to adopt bidding credits for a particular service, the Part 1 rules provide that the Commission may do so by adopting small business or rural service provider bidding credits in the service-specific rules for a band. 47 CFR § 1.2110(f)(1). However, any caps with respect to available bidding credits are adopted on an auction-by-auction basis. *Id.* § 1.2110(f)(2)(ii) (cap on designated entity bidding discount), (4)(ii) (cap on rural service provider discount).

¹¹⁰ 47 CFR § 1.2110(f)(4)(i) (bidding credit of 15 percent for applicants meeting the requirements for being designated as a rural service provider). To be eligible to receive a rural service provider bidding credit, an applicant

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designated entity bidding credits should consider which characteristics of licenses in the band may affect whether designated entities will apply for them.¹¹¹

68. *Renewal term construction obligations.* In addition to, and independent of, the general renewal requirements contained in section 1.949 of our rules, which apply to all Wireless Radio Services (WRS) licensees, we also seek comment on application of specific renewal term construction obligations to 900 MHz broadband licensees. In the *WRS Renewal Reform FNPRM*, we reiterated the Commission's mandate under the Communications Act to promote "the development and rapid deployment of new technologies, products, and services . . . for those residing in rural areas," and we sought comment on various renewal term construction obligations that might serve those goals.¹¹² Further, we noted that the Communications Act requires that, in prescribing regulations for the assignment of initial licenses through a system of competitive bidding, the Commission shall "include performance requirements, such as appropriate deadlines and penalties for performance failures, to ensure prompt delivery of service to rural areas, to prevent stockpiling or warehousing of spectrum by licensees or permittees, and to promote investment in and rapid deployment of new technologies and services."¹¹³ In furtherance of these statutory mandates and in order to address the real and growing digital divide between rural and urban areas in the United States, the *WRS Renewal Reform FNPRM* sought comment on various renewal term construction obligations, such as incremental increases in the construction metric in each subsequent renewal term—e.g., by 5 or 10 percent—up to a certain threshold.¹¹⁴ In the event that licensees fail to satisfy any additional renewal term construction obligations, the Commission sought comment on a range of penalties and on methods for reassigning the unused spectrum, including automatic termination, "keep-what-you-serve," and "use or share" approaches.¹¹⁵

69. The *WRS Renewal Reform FNPRM* proposed to apply rules adopted in that proceeding to all flexible geographic licenses.¹¹⁶ Given our proposal to license this band on a geographic basis for flexible use, any additional renewal term construction obligations proposed in the *WRS Renewal Reform FNPRM* also would apply to licenses in the 900 MHz broadband spectrum. We seek comment on whether there are unique characteristics of 900 MHz broadband spectrum that might require a different approach to the 900 MHz band from the various proposals raised by the *WRS Renewal Reform FNPRM*. For example, while most existing wireless radio services have 10-year license terms,¹¹⁷ here we seek comment on a 15-year license term for 900 MHz broadband licensees. Do any of our proposals for this band, such as potentially longer license terms, necessitate a more tailored approach than the rules of general applicability proposed in the *WRS Renewal Reform FNPRM*? For instance, should we require buildout to 85 percent of the population by the end of second license term? Similarly, in the event we

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must meet the requirements set forth in Part 1. An applicant eligible for both small business bidding credits and rural service provider bidding credits may only receive one of the two credits. *Id.* § 1.2110(f)(2)(i), (4)(i).

¹¹¹ To the extent that we adopt an auction approach for a transition of the 900 MHz band, we anticipate that we will resolve the issues of whether to offer bidding credits, to what extent such credits will be available, and the standards for eligibility for the credits, in an auction procedures Public Notice.

¹¹² See *WRS Renewal Reform 2nd R&O and FNPRM*, 32 FCC Rcd at 8911-18, paras. 100-23 (quoting 47 U.S.C. § 309(j)(3)(A)).

¹¹³ 47 U.S.C. § 309(j)(4)(B).

¹¹⁴ See *WRS Renewal Reform 2nd R&O and FNPRM*, 32 FCC Rcd at 8912-14, paras. 105-09. The "renewal term" is tied to the license and refers to the second full term a license enters after being renewed at the end of the initial term. Under this incremental increase approach, assignment of the license to a new licensee would not impact whether a license is deemed to be in its first or second full license term. *Id.*

¹¹⁵ *Id.* at 8915-17, paras. 114-17.

¹¹⁶ *Id.* at 8915, paras. 111-12.

¹¹⁷ See, e.g., 47 CFR §§ 24.15 (PCS); 27.13(a), (c), (d), (e), (g), (h), (i) (WCS).

permit licensees to demonstrate compliance with initial term performance requirements by providing IoT services, should an applicant deploying IoT applications in 900 MHz broadband spectrum be required to exceed its original construction metric by an additional five percent? Commenters advocating rules specific to the reconfigured 900 MHz band should address the costs and benefits of their proposed rules, and they should discuss how a given proposal would encourage investment and deployment in areas that might not otherwise benefit from significant wireless coverage.

D. Technical Rules

1. Broadband Segment

70. Our goal in establishing technical rules for broadband operations is to develop flexible rules that enable a wide variety of services, while providing sufficient protection to licensees in adjacent narrowband spectrum, as well as to licensees in the broadband segment in adjacent areas. This approach allows our rules to keep pace with changing technology and ensure that this band is used efficiently. We seek comment on our proposed technical rules, and whether they achieve these goals.¹¹⁸

71. Currently, 900 MHz base stations are limited to an effective radiated power not to exceed 1 kilowatt (30 dBw) and an antenna height above average terrain (HAAT) not to exceed 304 meters (1,000 feet), with the maximum permissible power decreasing as the HAAT rises above 304 meters.¹¹⁹ In recent proceedings, the Commission has applied the power spectral density (PSD)¹²⁰ concept when adopting transmission power limits, so as to take into account the availability and deployment of advanced mobile broadband technologies, such as LTE.¹²¹ A PSD model allows greater broadband coverage than non-PSD limits.¹²² We propose to permit an effective radiated power for base and repeater stations in the broadband segment not to exceed 400 watts/megahertz in non-rural areas and 800 watts/megahertz in rural areas, with the maximum permissible power decreasing as the HAAT rises above 304 meters. For operations in the Canada/Mexico border region, licensees are subject to international agreements between Canada and Mexico. The existing agreements, which include limitations on power and channel usage, are designed for narrowband operations, as broadband operations in the band did not exist and were not contemplated at the time the agreements were negotiated.¹²³ Therefore, new or modified agreements are likely to be necessary to both maximize broadband use in the border region and help prevent interference to/from Canada and Mexico operations. Future broadband licensees in the 900 MHz band would be subject to any international agreements governing border-area operations.

72. We also propose to establish a median field strength limit of 40 dB μ V/m at any given point along the geographic license area boundary in the broadband segment unless the affected licensee agrees to a higher field strength limit. This limit corresponds to the current field strength limit at the

¹¹⁸ See Appendix A, *infra*.

¹¹⁹ See 47 CFR § 90.635(a).

¹²⁰ See *id.* § 22.99 (defining “power spectral density” to mean “[t]he power of an emission in the frequency domain, such as in terms of ERP or EIRP, stated per unit bandwidth, *e.g.*, watts/MHz”).

¹²¹ See, *e.g.*, *Cellular Reform Second Report and Order*, 32 FCC Rcd at 2520, 2535, paras. 2, 40.

¹²² See *id.*

¹²³ See Sharing Arrangement Between the Department of Communications of Canada and the Federal Communications Commission of the United States of America Concerning the Use of the Bands 896-901 MHz and 935-940 MHz Along the Canada-United States Border, dated August 15, 1990; https://transition.fcc.gov/ib/sand/agree/files/can-nb/896_940.pdf and the Protocol Between The Department Of State Of The United States Of America And The Secretariat Of Communications And Transportation Of The United Mexican States Concerning the Allotment, Assignment and Use of The 806-824/851-869 MHz and 896-901/935-940 MHz Bands for Terrestrial Non-Broadcasting Radiocommunication Services Along the Common Border, dated June 8, 2012; https://transition.fcc.gov/ib/sand/agree/files/mex-nb/806_896.pdf.

border between co-channel 900 MHz SMR licensees.¹²⁴

73. We propose to make broadband licensees responsible for preventing harmful interference¹²⁵ to narrowband operations and for resolving any interference in the shortest time practicable. We note that, under existing 900 MHz co-channel separation requirements, co-channel systems generally must comply with a minimum spacing criteria of at least 113 kilometers (70 miles) separation distance between base stations.¹²⁶ We seek comment on applying existing minimum spacing criteria to 900 MHz broadband base station operations as a means of protecting co-channel narrowband licensees. In addition, section 90.672(a)(1)(i)(A)-(B) currently defines unacceptable interference in the 900 MHz B/ILT Pool as a median desired signal strength of -88 dBm or higher as measured at the radiofrequency input of the receiver of a mobile unit, or -85 dBm or higher as measured at the radiofrequency input of the receiver of a portable station.¹²⁷ Some commenters, however, propose to define harmful interference as receiving a median desired signal strength of -98 dBm or higher as measured at the radiofrequency input of the receiver of a mobile unit, or -95 dBm or higher as measured at the radiofrequency input of the receiver of a portable station (hand-held device), and suggest that we account for environmental noise by incorporating fade margins of 10 dB.¹²⁸ We seek comment on whether these criteria are appropriate, or whether we should adopt technical standards and procedures that more closely align with the existing rules regarding unacceptable interference to non-cellular 800 MHz licensees from 800 MHz cellular systems or Part 22 Cellular Radiotelephone systems, and within the 900 MHz B/ILT Pool.¹²⁹ We also ask whether it is practical to adopt a single standard to protect all narrowband operations from broadband operations, or whether separate criteria are needed for different circumstances, such as if the 897.5-900.5 MHz/936.5-939.5 MHz band is being used for broadband operations in one area but an adjacent area has not transitioned to the new band alignment.

74. As discussed above, the placement of a 3/3 megahertz broadband license at 897.5-900.5 MHz/936.5-939.5 MHz would create 1.5 megahertz of separation between 900 MHz broadband operations, and adjacent Air-Ground Radiotelephone Service and fixed microwave systems. It would also provide 500 kilohertz of separation between broadband operations and Narrowband Personal Communications Service operations. We believe this approach would protect Air-Ground Radiotelephone Service, fixed, and Narrowband Personal Communications Service users from harmful interference, and allow greater separation between co-located narrowband channels. Additionally, we propose to establish an out-of-band emission limit outside a licensee's frequency band of operation to be attenuated by at least $43 + 10 \log(P)$ dB for uplink operations in the 897.5-900.5 MHz band¹³⁰ and by at least $50 + 10 \log(p)$ dB for downlink operations in the 936.5-939.5 MHz band. Narrowband Personal Communications Service infrastructure consists of mainly fixed data operations with large numbers of fixed low-power remote mobile and portable receivers. These units, such as advanced metering infrastructure systems, are highly sensitive, increasing the risk of receiving harmful interference. We believe the more stringent asymmetrical emission mask that we propose will further protect Narrowband Personal Communications Service users from out-of-band emissions. We ask commenters to discuss whether our proposed out-of-band emission limits are sufficient to protect narrowband operations in the adjacent narrowband

¹²⁴ See 47 CFR § 90.671; see also Appendix A, proposed 47 CFR § 27.1521.

¹²⁵ Under the Commission's rules, harmful interference is defined as interference which endangers the functioning of a radionavigation service or of other safety services or seriously degrades, obstructs, or repeatedly interrupts a radiocommunication service operating in accordance with the ITU Radio Regulations. 47 CFR § 2.1(c).

¹²⁶ 47 CFR § 90.621(b).

¹²⁷ *Id.* § 90.672(a)(1)(i)(A)-(B).

¹²⁸ See EWA/PDV Reply, Exhibit A at 11; EWA/PDV Proposed Rules.

¹²⁹ See 47 CFR §§ 90.672-90.674.

¹³⁰ See *id.* § 90.669(a).

segments, and whether we should consider other harmful interference mitigation methods, such as limits on LTE transmitter power or additional transmitter filtering requirements.

75. Lastly, we ask commenters to discuss whether our proposed technical parameters are consistent with interference resistance of current 900 MHz narrowband radio equipment and systems. In other words, will the Commission be able to ensure adequate interference protection to narrowband operations by imposing appropriate technical limits to broadband operations only, or will co-existence of adjacent narrowband and broadband operations require changes to narrowband equipment, such as replacement or additional equipment or hardware and software upgrades, in addition to simple retuning?

2. Narrowband Segments

76. Under our proposal, in the markets that are transitioned to broadband use through one or more of the mechanisms described in Section III.B, the 896-897.5/935-936.5 MHz and 900.5-901/939.5-940 MHz bands would no longer have a distinction between B/ILT and SMR blocks, and would instead be designated as the narrowband segment available for site-based operations. We seek comment on whether any changes to the existing technical and operational rules are necessary or desirable to sustain continued 900 MHz site-based narrowband operations.¹³¹ Are the existing Part 90 technical rules suitable for narrowband operations in the newly designated paired narrowband segments? Specifically, given the proposal to eliminate the distinction between B/ILT and SMR blocks in the narrowband segment in transitioned markets, would new and existing narrowband segment licensees need additional or modified interference protections? We note that, under our voluntary exchange proposal, the band may be transitioned to the new broadband alignment on a county-by-county basis. Where a county has successfully been transitioned, would narrowband licensees in adjacent counties not transitioned to broadband require modified interference protection from newly licensed co-channel broadband operations? If so, commenters should specify the changes they believe should be made to the technical and operational rules for the two narrowband segments.

IV. PROCEDURAL MATTERS

77. *Ex Parte Presentations.* The proceeding shall be treated as a “permit-but-disclose” proceeding in accordance with the Commission’s *ex parte* rules.¹³² Persons making *ex parte* presentations must file a copy of any written presentation or a memorandum summarizing any oral presentation within two business days after the presentation (unless a different deadline applicable to the Sunshine period applies). Persons making oral *ex parte* presentations are reminded that memoranda summarizing the presentation must (1) list all persons attending or otherwise participating in the meeting at which the *ex parte* presentation was made, and (2) summarize all data presented and arguments made during the presentation. If the presentation consisted in whole or in part of the presentation of data or arguments already reflected in the presenter’s written comments, memoranda or other filings in the proceeding, the presenter may provide citations to such data or arguments in his or her prior comments, memoranda, or other filings (specifying the relevant page and/or paragraph numbers where such data or arguments can be found) in lieu of summarizing them in the memorandum. Documents shown or given to Commission staff during *ex parte* meetings are deemed to be written *ex parte* presentations and must be filed consistent with rule 1.1206(b). In proceedings governed by rule 1.49(f) or for which the Commission has made available a method of electronic filing, written *ex parte* presentations and memoranda summarizing oral *ex parte* presentations, and all attachments thereto, must be filed through the electronic comment filing system available for that proceeding, and must be filed in their native format (e.g., .doc, .xml, .ppt, searchable .pdf). Participants in the proceeding should familiarize themselves with the Commission’s *ex parte* rules.

78. *Comment Period and Filing Procedures.* Pursuant to sections 1.415 and 1.419 of the

¹³¹ See, e.g., *NOI*, 32 FCC Rcd at 6429-30, paras. 24-25.

¹³² 47 CFR § 1.1200 *et seq.*

Commission's rules, 47 CFR §§ 1.415, 1.419, 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://apps.fcc.gov/ecfs/>.
- Paper Filers: Parties who choose to file by paper must file an original and one copy of each filing. If more than one active docket or rulemaking number appears in the caption of this proceeding, filers must submit two additional copies for each additional docket or rulemaking number.

79. 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 9050 Junction Drive, Annapolis Junction, MD 20701.
- U.S. Postal Service first-class, Express, and Priority mail must be addressed to 445 12th Street, SW, Washington DC 20554.

80. 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).

81. *Availability of Documents.* Comments, reply comments, and *ex parte* submissions will be available for public inspection during regular business hours in the FCC Reference Center, Federal Communications Commission, 445 12th Street, S.W., Room CY-A257, Washington, D.C. These documents will also be available via ECFS. Documents will be available electronically in ASCII, Microsoft Word, and/or Adobe Acrobat.

82. *Initial Regulatory Flexibility Analysis.* As required by the Regulatory Flexibility Act,¹³³ the Commission has prepared an Initial Regulatory Flexibility Analysis (IRFA) of the possible significant economic impact on a substantial number of small entities of the proposals addressed in this *Notice of Proposed Rulemaking*. The IRFA is set forth in Appendix B. Written public comments are requested on the IRFA. These comments must be filed in accordance with the same filing deadlines for comments on the *Notice of Proposed Rulemaking*, and should have a separate and distinct heading designating them as responses to the IRFA. The Commission's Consumer and Governmental Affairs Bureau, Reference Information Center, will send a copy of this *Notice of Proposed Rulemaking*, including the IRFA, to the Chief Counsel for Advocacy of the Small Business Administration in accordance with the Regulatory Flexibility Act.¹³⁴

83. *Paperwork Reduction Analysis.* This document contains proposed new or modified information collection requirements. The Commission, as part of its continuing effort to reduce paperwork burdens, invites the general public and the Office of Management and Budget (OMB) to

¹³³ 5 U.S.C. § 603.

¹³⁴ See *id.* § 603(a).

comment on the information collection requirements contained in this document, as required by the Paperwork Reduction Act of 1995, Public Law 104-13. In addition, pursuant to the Small Business Paperwork Relief Act of 2002, Public Law 107-198, *see* 44 U.S.C. 3506(c)(4), we seek specific comment on how we might further reduce the information collection burden for small business concerns with fewer than 25 employees.

84. *Further 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

85. IT IS ORDERED, pursuant to the authority found in sections 4(i), 302, 303, and 309, of the Communications Act of 1934, as amended, 47 U.S.C. §§ 151, 152, 153, 154(i), 201, 301, 302a, 303, 304, 307, 308, 309, 310, 319, 324, 332, 333, and section 1.411 of the Commission's Rules, 47 C.F.R. § 1.411, that this *Notice of Proposed Rulemaking* IS HEREBY ADOPTED.

86. IT IS FURTHER ORDERED that the Commission's Consumer and Governmental Affairs Bureau, Reference Information Center, SHALL SEND a copy of this *Notice of Proposed Rulemaking*, including the Initial Regulatory Flexibility Analysis, to the Chief Counsel for Advocacy of the Small Business Administration.

FEDERAL COMMUNICATIONS COMMISSION

Marlene H. Dortch
Secretary

APPENDIX A

Proposed Rules

The Federal Communications Commission proposes to amend 47 CFR parts 1, 2, 20, 27 and 90 as follows:

PART 1 – PRACTICE AND PROCEDURE

1. The authority citation for part 1 continues to read as follows:

Authority: 47 U.S.C. chs. 2, 5, 9, 13; Sec. 102(c), Div. P, Public Law 115-141, 132 Stat. 1084; 28 U.S.C. 2461, unless otherwise noted.

2. Section 1.907 is amended by revising the definition of “Covered Geographic Licenses” to read as follows:

§ 1.907 Definitions.

* * * * *

Covered Geographic Licenses. Covered geographic licenses consist of the following services: 1.4 GHz Service (part 27, subpart I of this chapter); 1.6 GHz Service (part 27, subpart J); 24 GHz Service and Digital Electronic Message Services (part 101, subpart G); 218-219 MHz Service (part 95, subpart F); 220-222 MHz Service, excluding public safety licenses (part 90, subpart T); 600 MHz Service (part 27, subpart N); 700 MHz Commercial Services (part 27, subparts F and H); 700 MHz Guard Band Service (part 27, subpart G); 800 MHz Specialized Mobile Radio Service (part 90, subpart S); 900 MHz Specialized Mobile Radio Service (part 90, subpart S); 900 MHz Broadband Service (part 27, subpart P); Advanced Wireless Services (part 27, subparts K and L); Air-Ground Radiotelephone Service (Commercial Aviation) (part 22, subpart G); Broadband Personal Communications Service (part 24, subpart E); Broadband Radio Service (part 27, subpart M); Cellular Radiotelephone Service (part 22, subpart H); Dedicated Short Range Communications Service, excluding public safety licenses (part 90, subpart M); H Block Service (part 27, subpart K); Local Multipoint Distribution Service (part 101, subpart L); Multichannel Video Distribution and Data Service (part 101, subpart P); Multilateration Location and Monitoring Service (part 90, subpart M); Multiple Address Systems (EAs) (part 101, subpart O); Narrowband Personal Communications Service (part 24, subpart D); Paging and Radiotelephone Service (part 22, subpart E; part 90, subpart P); VHF Public Coast Stations, including Automated Maritime Telecommunications Systems (part 80, subpart J); Upper Microwave Flexible Use Service (part 30); and Wireless Communications Service (part 27, subpart D).

* * * * *

3. Section 1.1307 is amended by revising Table 1 by revising the entry for Miscellaneous Wireless Communications Services, and adding a new entry for 900 MHz Broadband Service between the entry for Broadband Radio Service and Educational Broadband Service and the entry for Upper Microwave Flexible Use Service, to read as follows:

§ 1.1307 Actions that may have a significant environmental effect, for which Environmental Assessments (EAs) must be prepared.

* * * * *

(b) * * *

(1) * * *

Table 1—Transmitters, Facilities and Operations Subject to Routine Environmental Evaluation

Service (title 47 CFR rule part)	Evaluation required if:
* * *	* * *
Miscellaneous Wireless Communications Services (part 27 except subparts M and P)	(1) For the 1390-1392 MHz, 1392-1395 MHz, 1432-1435 MHz, 1670-1675 MHz, and 2385-2390 MHz bands: Non-building-mounted antennas: height above ground level to lowest point of antenna <10 m and total power of all channels >2000 W ERP (3280 W EIRP). Building-mounted antennas: Total power of all channels >2000 W ERP (3280 W EIRP).
* * *	* * *
900 MHz Broadband Service (subpart P of part 27)	Non-building-mounted antennas: height above ground level to lowest point of antenna <10 m and total power of all channels >1000 W ERP (1640 W EIRP). Building-mounted antennas: Total power of all channels >1000 W ERP (1640 W EIRP).
* * *	* * *

* * * * *

4. Section 1.9005 is amended by adding a new paragraph (mm) to read as follows:

§ 1.9005 Included services.

* * * * *

(mm) The 900 MHz Broadband Service (part 27 of this chapter).

PART 2 – FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS

5. The authority citation for part 2 continues to read as follows:

Authority: 47 U.S.C. 154, 302a, 303, and 336, unless otherwise noted.

6. Section 2.106 is amended by revising page 31 to read as follows:

International Table			United States Table		FCC Rule Part(s)	
Region 1 Table	Region 2 Table	Region 3 Table	Federal Table	Non-Federal Table		
890-942 FIXED MOBILE except aeronautical mobile 5.317A BROADCASTING 5.322 Radiolocation	890-902 FIXED MOBILE except aeronautical mobile 5.317A Radiolocation	890-942 FIXED MOBILE 5.317A BROADCASTING Radiolocation	890-902	(See previous page)		
			894-896 AERONAUTICAL MOBILE US116 US268	Public Mobile (22)		
			896-901 FIXED MOBILE except aeronautical mobile US116 US268	Wireless Communications (27) Private Land Mobile (90)		
		5.318 5.325		US116 US268 G2	US116 US268	Personal Communications (24)
		902-928 FIXED Amateur Mobile except aeronautical mobile 5.325A Radiolocation 5.150 5.325 5.326		902-928 RADIOLOCATION G59 5.150 US218 US267 US275 G11	902-928 5.150 US218 US267 US275	ISM Equipment (18) Private Land Mobile (90) Amateur Radio (97)
		928-942 FIXED MOBILE except aeronautical mobile 5.317A Radiolocation		928-932	928-929 FIXED US116 US268 NG35	Public Mobile (22) Private Land Mobile (90) Fixed Microwave (101)
					929-930 FIXED LAND MOBILE US116 US268	Private Land Mobile (90)
					930-931 FIXED MOBILE US116 US268	Personal Communications (24)
					931-932 FIXED LAND MOBILE US116 US268	Public Mobile (22)
				932-935 FIXED US268 G2	932-935 FIXED US268 NG35	Public Mobile (22) Fixed Microwave (101)
				935-941	935-940 FIXED MOBILE except aeronautical mobile US116 US268	Wireless Communications (27) Private Land Mobile (90)
					940-941 FIXED MOBILE US116 US268	Personal Communications (24)

PART 20 – COMMERCIAL MOBILE SERVICES

7. The authority citation for part 20 continues to read as follows:

Authority: 47 U.S.C. 151, 152(a) 154(i), 157, 160, 201, 214, 222, 251(e), 301, 302, 303, 303(b), 303(r), 307, 307(a), 309, 309(j)(3), 316, 316(a), 332, 610, 615, 615a, 615b, 615c, unless otherwise noted.

8. Section 20.12 is amended by revising paragraph (a)(1) to read as follows:

§ 20.12 Resale and roaming.

(a)(1) Scope of manual roaming and resale. Paragraph (c) of this section is applicable to providers of Broadband Personal Communications Services (part 24, subpart E of this chapter), Cellular Radio Telephone Service (part 22, subpart H of this chapter), Specialized Mobile Radio Services in the 800 MHz and 900 MHz bands (included in part 90, subpart S of this chapter), and 900 MHz Broadband Service (included in part 27, subpart P of this chapter) if such providers offer real-time, two-way switched voice or data service that is interconnected with the public switched network and utilizes an in-network switching facility that enables the provider to re-use frequencies and accomplish seamless hand-offs of subscriber calls. The scope of paragraph (b) of this section, concerning the resale rule, is further limited so as to exclude from the requirements of that paragraph those Broadband Personal Communications Services C, D, E, and F block licensees that do not own and control and are not owned and controlled by firms also holding cellular A or B block licenses.

* * * * *

PART 27 – MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES

9. The authority citation for part 27 continues to read as follows:

Authority: 47 U.S.C. 154, 301, 302a, 303, 307, 309, 332, 336, 337, 1403, 1404, 1451, and 1452, unless otherwise noted.

10. Section 27.1 is amended by adding paragraph (b)(15) to read as follows:

§ 27.1 Basis and purpose.

* * * * *

(b) * * *

(15) 897.5-900.5 MHz and 936.5-939.5 MHz.

11. Section 27.5 is amended by adding paragraph (m) to read as follows:

§ 27.5 Frequencies.

* * * * *

(m) *900 MHz Broadband.* The paired 897.5-900.5 MHz and 936.5-939.5 MHz bands are available for assignment on a geographic basis. For operations in the 897.5-900.5 MHz and 936.5-939.5 MHz bands (designated as Channels 121-360 in section 90.613 of this chapter), no new applications for narrowband systems under part 90, subpart S of this chapter will be accepted and no applications for modification of existing stations for major changes as defined in § 1.929 of this chapter will be accepted pursuant to § 27.1517 of this part.

* * * * *

12. Section 27.12 is amended by revising paragraph (a) to read as follows:

(a) Except as provided in paragraph (b) and in §§ 27.604, 27.1201, 27.1202, and 27.1509, any entity other than those precluded by section 310 of the Communications Act of 1934, as amended, 47 U.S.C. 310, is eligible to hold a license under this part.

13. Section 27.13 is amended by adding paragraph (m) to read as follows:

§ 27.13 License Period.

* * * * *

(m) *900 MHz Broadband.* Authorizations for the 897.5-900.5 MHz and 936.5-939.5 MHz bands will have a term not to exceed 15 years from the date of initial issuance.

* * * * *

14. Part 27 is amended by adding a new subpart P to read as follows:

Subpart P—Regulations Governing Licensing and Use of 900 MHz Broadband Service in the 896-901 and 935-940 MHz Bands

27.1501 Scope
 27.1503 Definitions
 27.1505 Licensing of the 897.5-900.5/936.5-939.5 MHz band
 27.1507 900 MHz Broadband subject to competitive bidding
 27.1509 Eligibility
 27.1511 Performance requirements
 27.1513 [Reserved]
 27.1515 [Reserved]
 27.1517 Frequencies
 27.1519 Effective radiated power limits for 900 MHz Broadband systems
 27.1521 Field strength limit
 27.1523 [Reserved]
 27.1525 Emission limits
 27.1527 [Reserved]

§ 27.1501 Scope.

This subpart sets out the regulations governing the licensing and operations of 900 MHz BB systems operating in the 897.5-900.5/936.5-939.5 MHz band. It includes eligibility requirements and operational and technical standards for stations licensed in this band. It also supplements the rules regarding application procedures contained in part 1, subpart F of this chapter and the competitive bidding procedures contained in part 1, subpart Q of this chapter. The rules in this subpart are to be read in conjunction with the applicable requirements contained elsewhere in this part; however, in case of conflict, the provisions of this subpart shall govern with respect to licensing, competitive bidding and operation in this frequency band.

§ 27.1503 Definitions.

Terms used in this subpart shall have the following meanings:

(a) *900 MHz Broadband (900 MHz BB)*. The market-based 900 MHz broadband systems in the 897.5-900.5/936.5-939.5 MHz band licensed by the Commission pursuant to the provisions of this subpart.

(b) *900 MHz Broadband (900 MHz BB) licensee*. An entity that holds a 900 MHz BB license issued pursuant to § 27.1505 of this subpart.

(c) *900 MHz Narrowband*. The segment of realigned 900 MHz spectrum in the 896-897.5/900.5-901/935-936.5/939.5-940 MHz band designated for narrowband operations and licensed pursuant to 47 CFR part 90, subpart S of this chapter.

(d) *Covered incumbent licensee*. Any entity that holds an existing site-based license in the 897.5-900.5/936.5-939.5 MHz band that, pursuant to § 90.621 of this chapter, is required to be protected by the 900 MHz BB licensee's placement of a base station at any location within the county covered by the BB license.

(d) *Power spectral density (PSD)*. The power of an emission in the frequency domain, such as in terms of ERP or EIRP, stated per unit bandwidth, e.g., watts/MHz.

(e) *Prospective broadband licensee*. An entity that holds the licenses for all 20 blocks of geographically-licensed SMR spectrum in the 896-901/935-940 MHz band and seeks to acquire a 900 MHz BB license via a Voluntary Exchange Process.

(f) *Voluntary Exchange Process*. The process for realigning the 896-901/935-940 MHz band, whereby the prospective broadband licensee and covered incumbent licensees voluntarily agree to a Transition Plan that will relocate to the 900 MHz Narrowband segment and/or provide interference protection to all incumbent operations, thereby making the 900 MHz Broadband segment available for the prospective broadband licensee's use, pursuant to the provisions of this subpart.

(g) *Transition Plan*. Under a Voluntary Exchange Process for realigning the 900 MHz band, a filing made to the Commission as part of the prospective broadband licensee's application for a new 900 MHz BB license that describes: (1) the spectrum frequencies within the broadband segment that the prospective broadband licensee seeks from Commission inventory, (2) the rights to all 20 geographically-licensed SMR blocks, and any site-based SMR or B/ILT licenses in the county that the licensee is relinquishing, (3) the applications that the parties to the agreement will file for spectrum in the narrowband segment in order to relocate or repack licensees, (4) a description of how the applicant will provide interference protection to, and/or relocate from the broadband segment, all covered incumbents, and (5) any rule waivers or other actions necessary to implement the Transition Plan.

§ 27.1505 Licensing of the 897.5-900.5/936.5-939.5 MHz band.

(a) *License Area*. [Reserved]

(b) A 900 MHz BB licensee that permanently discontinues service as defined in § 1.953 must notify the Commission of the discontinuance within 10 days by filing FCC Form 601 requesting license cancellation. An authorization will automatically terminate, without specific Commission action, if service is permanently discontinued as defined in this chapter, even if a licensee fails to file the required form requesting license cancellation.

§ 27.1507 900 MHz Broadband subject to competitive bidding.

Mutually exclusive initial applications for 900 MHz broadband licenses are subject to competitive bidding. The general competitive bidding procedures set forth in 47 CFR part 1, subpart Q of this chapter will apply unless otherwise provided in this subpart.

§ 27.1509 Eligibility

(a) *Voluntary Exchange Process.* Eligibility for a 900 MHz BB license in a county that is transitioned using a Voluntary Exchange Process is limited to the following restrictions:

(1) The applicant must hold the licenses for all 20 blocks of geographically-licensed 900 MHz SMR spectrum in the county;

(2) The applicant must account for all covered incumbent(s) by demonstrating one or more of the following: (1) agreement by covered incumbent(s) to relocate from the broadband segment, (2) protection of covered incumbent(s) through compliance with minimum spacing criteria set forth in § 90.621(b) of this chapter, and/or (3) protection of covered incumbent(s) through new or existing letters of concurrence agreeing to lesser base station separations. The applicant may use its current 900 MHz holdings in the narrowband segment to relocate covered incumbents. Spectrum used for the purposes of relocating incumbent(s) may not exceed the incumbent's current spectrum holdings in the relevant county, unless additional channels are necessary to achieve equivalent coverage and/or capacity; and

(3) The applicant must agree to return to the Commission the rights to all 20 blocks of geographically-licensed SMR spectrum in the relevant county, as well as any B/ILT or SMR site-based licenses.

(b) *Auction.* Eligibility for a 900 MHz BB license in a county that has been transitioned using an auction mechanism is subject to the restrictions listed in § 27.12 of this chapter.

§ 27.1511 Performance requirements.

(a) 900 MHz BB licensees shall demonstrate compliance with performance requirements by filing a construction notification with the Commission, within 15 days of the expiration of the applicable benchmark, in accordance with the provisions set forth in § 1.946(d) of this chapter.

(1) The licensee must certify whether it has met the applicable performance requirements. The licensee must file a description and certification of the areas for which it is providing service. The construction notifications must include electronic coverage maps and supporting technical documentation regarding the type of service it is providing for each licensed area within its service territory and the type of technology used to provide such service, and certify the accuracy of such documentation. Supporting documentation must include the assumptions used to create the coverage maps, including the propagation model and the signal strength necessary to provide reliable service with the licensee's technology.

(2) To demonstrate compliance with these performance requirements, licensees shall use the most recently available decennial U.S. Census Data at the time of measurement and shall base their measurements of population served on areas no larger than the Census Tract level. The population within a specific Census Tract (or other acceptable identifier) will be deemed served by the licensee only if it provides reliable signal coverage to and offers service within the specific Census Tract (or other acceptable identifier). To the extent the Census Tract (or other acceptable identifier) extends beyond the boundaries of a license area, a licensee with authorizations for such areas may include only the population within the Census Tract (or other acceptable identifier) towards meeting the performance requirement of a single, individual license.

(b) The following performance requirements apply to 900 MHz BB licensees:

(1) A licensee shall provide reliable signal coverage and offer service within six years from the date of the initial license to at least 45 percent of the population in each of its license areas (“First Buildout Requirement”).

(2) A licensee shall provide reliable signal coverage and offer service within 12 years from the date of the initial license to at least 80 percent of the population in each of its license areas (“Second Buildout Requirement”).

(3) If a licensee fails to establish that it meets the First Buildout Requirement for a particular license area, the licensee’s Second Buildout Requirement deadline and license term will be reduced by two years.

(4) If a licensee fails to establish that it meets the Second Buildout Requirement for a particular license area, its authorization for each license area in which it fails to meet the Second Buildout Requirement shall terminate automatically without Commission action, and the licensee will be ineligible to regain it if the Commission makes the license available at a later date.

(c) *Broadband Service Requirement.* To satisfy the performance requirements described in paragraph (b), 900 MHz BB licensees must deploy broadband technologies and offer broadband services.

§ 27.1513 [Reserved]

§ 27.1515 [Reserved]

§ 27.1517 Frequencies.

896-901 MHz and 935-940 MHz bands. The 897.5-900.5 MHz and 936.5-939.5 MHz band segments are available for licensing with an authorized bandwidth up to 3 megahertz. The 897.5-900.5 MHz segment must only be used for uplink transmissions. The 936.5-939.5 MHz segments must only be used for downlink transmissions.

§ 27.1519 Effective radiated power limits for 900 MHz Broadband systems.

(a) Maximum ERP. The power limits specified in this section are applicable to operations outside the Canadian and Mexican border areas. Power limits for operation in those areas are specified in section 27.1523 of this part.

(1) General Limit.

(i) The ERP for base and repeater stations must not exceed 400 watts/megahertz power spectral density (PSD) per sector and an antenna height of 304 m height above average terrain (HAAT), except that antenna heights greater than 304 m HAAT are permitted if power levels are reduced below 400 watts/megahertz ERP in accordance with Table 1 of paragraph (e) of this section.

(ii) Provided that they also comply with paragraphs (b) and (c) of this section, licensees are permitted to operate base and repeater stations with up to a maximum ERP of 1000 watts/megahertz power spectral density (PSD) per sector and an antenna height of 304 m height above average terrain (HAAT), except that antenna heights greater than 304 m HAAT are permitted if power levels are reduced below 1000 watts/megahertz ERP in accordance with Table 2 of paragraph (e) of this section.

(2) Rural Areas. For systems operating in areas more than 110 km (68.4 miles) from the U.S./Mexico border and 140 km (87 miles) from the U.S./Canadian border that are located in counties

with population densities of 100 persons or fewer per square mile, based upon the most recently available population statistics from the Bureau of the Census:

(i) The ERP for base and repeater stations must not exceed 800 watts/megahertz power spectral density (PSD) per sector and an antenna height of 304 m height above average terrain (HAAT), except that antenna heights greater than 304 m HAAT are permitted if power levels are reduced below 800 watts/megahertz ERP in accordance with Table 3 of paragraph (e) of this section.

(ii) Provided that they also comply with paragraphs (b) and (c) of this section, base and repeater stations may operate with up to a maximum ERP of 2000 watts/megahertz power spectral density (PSD) per sector and an antenna height of 304 m height above average terrain (HAAT), except that antenna heights greater than 304 m HAAT are permitted if power levels are reduced below 2000 watts/megahertz ERP in accordance with Table 4 of paragraph (e) of this section.

(3) Mobile, control and auxiliary test stations must not exceed 10 watts ERP.

(4) Portable stations must not exceed 3 watts ERP.

(b) Power flux density (PFD). Each 900 MHz BB base or repeater station that exceeds the ERP limit of paragraphs (a)(1)(i) or (a)(2)(i) of this section must be designed and deployed so as not to exceed a modeled PFD of 3000 microwatts/m²/MHz over at least 98% of the area within 1 km of the base or repeater station antenna, at 1.6 meters above ground level. To ensure compliance with this requirement, the licensee must perform predictive modeling of the PFD values within at least 1 km of each base or repeater station antenna prior to commencing such operations and, thereafter, prior to making any site modifications that may increase the PFD levels around the base or repeater station. The modeling must take into consideration terrain and other local conditions and must use good engineering practices for the 900 MHz band.

(c) Power measurement. Measurement of 900 MHz BB base transmitter and repeater ERP must be made using an average power measurement technique. Power measurements for base transmitters and repeaters must be made in accordance with either of the following:

(1) A Commission-approved average power technique (see FCC Laboratory's Knowledge Database); or

(2) For purposes of this section, peak transmit power must be measured over an interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage. The measurement results shall be properly adjusted for any instrument limitations, such as detector response times, limited resolution bandwidth capability when compared to the emission bandwidth, sensitivity, etc., so as to obtain a true peak measurement for the emission in question over the full bandwidth of the channel.

(d) PAR limit. The peak-to-average ratio (PAR) of the transmission must not exceed 13 dB.

(e) Height-power limit. As specified in paragraph (a) of this section, the following tables specify the maximum base station power for antenna heights above average terrain (HAAT) that exceed 304 meters.

Table 1 – Permissible Power and Antenna Heights for Base Stations permitted to Transmit with up to 400 Watts/Megahertz

Antenna height (AAT) in meters (feet)	Effective radiated power (ERP) (watts/megahertz)
Above 1372 (4500)	26
Above 1220 (4000) To 1372 (4500)	28
Above 1067 (3500) To 1220 (4000)	30
Above 915 (3000) To 1067 (3500)	40
Above 763 (2500) To 915 (3000)	56
Above 610 (2000) To 763 (2500)	80
Above 458 (1500) To 610 (2000)	140
Above 305 (1000) To 458 (1500)	240
Up to 305 (1000)	400

Table 2 – Permissible Power and Antenna Heights for Base Stations Permitted to Transmit with up to 1000 Watts/Megahertz

Antenna height (AAT) in meters (feet)	Effective radiated power (ERP) (watts/megahertz)
Above 1372 (4500)	65
Above 1220 (4000) To 1372 (4500)	70
Above 1067 (3500) To 1220 (4000)	75
Above 915 (3000) To 1067 (3500)	100
Above 763 (2500) To 915 (3000)	140
Above 610 (2000) To 763 (2500)	200
Above 458 (1500) To 610 (2000)	350
Above 305 (1000) To 458 (1500)	600
Up to 305 (1000)	1000

Table 3 – Permissible Power and Antenna Heights for Base Stations Permitted to Transmit with up to 800 Watts/Megahertz

Antenna height (AAT) in meters (feet)	Effective radiated power (ERP) (watts/megahertz)
Above 1372 (4500)	52
Above 1220 (4000) To 1372 (4500)	56
Above 1067 (3500) To 1220 (4000)	60
Above 915 (3000) To 1067 (3500)	80
Above 763 (2500) To 915 (3000)	112
Above 610 (2000) To 763 (2500)	160
Above 458 (1500) To 610 (2000)	280
Above 305 (1000) To 458 (1500)	480
Up to 305 (1000)	800

Table 4 – Permissible Power and Antenna Heights for Base Stations Permitted to Transmit with up to 2000 Watts/Megahertz

Antenna height (AAT) in meters (feet)	Effective radiated power (ERP) (watts/megahertz)
Above 1372 (4500)	130
Above 1220 (4000) To 1372 (4500)	140
Above 1067 (3500) To 1220 (4000)	150
Above 915 (3000) To 1067 (3500)	200
Above 763 (2500) To 915 (3000)	280
Above 610 (2000) To 763 (2500)	400
Above 458 (1500) To 610 (2000)	700
Above 305 (1000) To 458 (1500)	1200
Up to 305 (1000)	2000

§ 27.1521 Field strength limit.

The predicted or measured median field strength must not exceed 40 dB μ V/m at any given point along the 900 MHz BB market boundary, unless the affected licensee agrees to a different field strength. This value applies to both the initially offered service areas and to partitioned service areas.

§ 27.1523 [Reserved]

§ 27.1525 Emission limits.

The power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) in watts by at least the following amounts:

- (a) For 900 MHz BB operations in 897.5-900.5 MHz band by at least $43 + 10 \log (P)$ dB.
- (b) For 900 MHz BB operations in the 936.5-939.5 MHz band, by at least $50 + 10 \log (P)$ dB.

(c) Measurement procedure. Compliance with the provisions of paragraphs (a) and (b) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the licensee's band, a resolution bandwidth of at least 1 percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

(d) The measurements of emission power can be expressed in peak or average values, provided they are expressed in the same parameters as the transmitter power.

PART 90 – PRIVATE LAND MOBILE RADIO SERVICES

15. The authority citation for part 90 continues to read as follows:

Authority: 47 U.S.C. 154(i), 161, 303(g), 303(r), 332(c)(7), 1401-1473.

16. Section 90.7 is amended by adding a definition for “900 MHz Broadband (900 MHz BB)” in alphabetical order to read as follows:

§ 90.7 Definitions.

* * * * *

900 MHz Broadband (900 MHz BB). See section 27.1503 of part 27 of this chapter.

* * * * *

17. Section 90.35 is be amended by revising paragraph (c)(71) to read as follows:

§ 90.35 Industrial/Business Pool.

(c) * * *

(71) Subpart S of this part contains rules for assignment of frequencies in the 806-821/851-866 MHz band and for narrowband operations in the 896-901/935-940 MHz band.

* * * * *

18. Section 90.205 is amended by revising paragraph (k) to read as follows:

§ 90.205 Power and antenna height limits.

* * * * *

(k) 806-824 MHz, 851-869 MHz, 896-901 MHz and 935-940 MHz. Power and height limitations for frequencies in the 806-821/851-866 MHz band and for narrowband operations in the 896-901/935-940 MHz band are specified in § 90.635 of this part.

* * * * *

19. Section 90.209 is amended by revising paragraph (b)(3) and adding a new footnote 7 to the table in paragraph (b)(5) to read as follows:

§ 90.209 Bandwidth limitations.

* * * * *

(b) * * *

(3) For all other types of emissions, except for emissions associated with 900 MHz BB systems under subpart P of part 27 of this chapter, the maximum authorized bandwidth shall not be more than that normally authorized for voice operations.

* * * * *

(5) * * *

Standard Channel Spacing/Bandwidth

Frequency band (MHz)	Channel spacing (kHz)	Authorized bandwidth (kHz)
* * *	* * *	* * *
896-901/935-940 ⁷	12.5	13.6
* * *	* * *	* * *

* * * * *

⁷ 900 MHz BB systems may operate on channels and with bandwidths pursuant to the rules specified in subpart P of part 27 of this chapter.

* * * * *

20. Section 90.210 is amended by adding a new footnote 7 to the table in the introductory text to read as follows:

§ 90.210 Emission masks.

* * * * *

APPLICABLE EMISSION MASKS

Frequency band (MHz)	Mask for equipment with audio low pass filter	Mask for equipment without audio low pass filter
* * *	* * *	* * *
896-901/935-940 ⁷	I	J
* * *	* * *	* * *

* * * * *

⁷ Equipment used with 900 MHz BB systems operating under subpart P of part 27 of this chapter is subject to the emission limitations in § 27.1525 of this chapter.

* * * * *

21. Section 90.213 is amended by adding a new footnote 15 to the table in paragraph (a) to read as follows:

§ 90.213 Frequency stability.

(a) * * *

Minimum Frequency Stability [Parts per million (ppm)]

Frequency range (MHz)	Fixed and base stations	Mobile stations	
		Over 2 watts output power	2 watts or less output power
* * *	* * *	* * *	* * *
896-901 ¹⁵	140.1	1.5	1.5
* * *	* * *	* * *	* * *
935-940 ¹⁵	0.1	1.5	1.5
* * *	* * *	* * *	* * *

* * * * *

¹⁵ Equipment used with 900 MHz BB systems operating under subpart P of part 27 of this chapter is exempt from the frequency stability requirements of this section. Instead, the frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

* * * * *

22. Section 90.601 is amended to read as follows:

§ 90.601 Scope.

This subpart sets out the regulations governing the licensing and operations of all systems operating in the 806-824/851-869 MHz and 896-901/935-940 MHz bands, except for 900 MHz BB systems operating in the 897.5-900.5/936.5-939.5 MHz band under subpart P of part 27 of this chapter. It includes eligibility requirements, and operational and technical standards for stations licensed in these bands. It also supplements the rules regarding application procedures contained in part 1, subpart F of this chapter. The rules in this subpart are to be read in conjunction with the applicable requirements contained elsewhere in this part; however, in case of conflict, the provisions of this subpart shall govern with respect to licensing and operation in these frequency bands.

23. Section 90.613 is amended by revising the introductory text to read as follows:

§ 90.613 Frequencies available.

The following table indicates the channel designations of frequencies available for assignment to eligible applicants under this subpart. Frequencies shall be assigned in pairs, with mobile and control station transmitting frequencies taken from the 806-824 MHz band with corresponding base station

frequencies being 45 MHz higher and taken from the 851-869 MHz band, or with mobile and control station frequencies taken from the 896-901 MHz band with corresponding base station frequencies being 39 MHz higher and taken from the 935-940 MHz band. For operations in the 897.5-900.5 MHz and 936.5-939.5 MHz bands (Channels 121-360), no new applications for narrowband systems under this subpart will be accepted and no applications for modification of existing stations for major changes as defined in § 1.929 of this chapter will be accepted pursuant to § 27.1517 of this chapter. Only the base station transmitting frequency of each pair is listed in the following table.

APPENDIX B

Initial Regulatory Flexibility Analysis

1. As required by the Regulatory Flexibility Act of 1980, as amended (RFA),¹ the Commission has prepared this present Initial Regulatory Flexibility Analysis (IRFA) of the possible significant economic impact on a substantial number of small entities by the policies and rules proposed in this *Notice of Proposed Rulemaking (Notice)*. Written public comments are requested on this IRFA. Comments must be identified as responses to the IRFA and must be filed by the deadlines for comments as specified in the *Notice*. The Commission will send a copy of this *Notice*, including this IRFA, to the Chief Counsel for Advocacy of the Small Business Administration (SBA).² In addition, the *Notice* and IRFA (or summaries thereof) will be published in the Federal Register.³

A. Need for, and Objectives of, the Proposed Rules

2. This *Notice* proposes to realign the 900 MHz band to create a broadband segment and to reserve the remainder of the 900 MHz band for continued narrowband operations. More specifically, the *Notice* seeks comment on the Commission's proposal to realign the 896-901/935-940 MHz band (900 MHz band) to create a 3/3 megahertz broadband segment to enable private broadband network solutions, while reserving the remaining 2/2 megahertz of spectrum for incumbents who wish to continue narrowband operations. The *Notice* also proposes to permit a market-driven approach through voluntary exchanges between incumbents to effectuate band clearing and realignment. Additionally, the *Notice* seeks comment on alternative options of conducting an auction of overlay licenses, coupled with mandatory band clearing of incumbents currently operating in the broadband segment, and conducting an incentive auction. The objective of this proposal is to increase access to spectrum to promote innovative broadband services that improve spectrum efficiency and expand operational flexibility, while continuing to accommodate use by narrowband incumbents. This proposal is consistent with the Commission's recent efforts in other frequency bands to increase access to spectrum to promote innovative broadband services that improve spectrum efficiency and expand operational flexibility.

3. The 900 MHz band consists of 399 narrowband (12.5 kilohertz) frequency pairs grouped into 10-channel blocks that alternate between Specialized Mobile Radio (SMR) blocks that are geographically licensed by Major Trading Area (MTA) and Business/Industrial/Land Transportation (B/ILT) blocks in which channels are assigned on a site-by-site basis. SMR service was established by the Commission to provide land mobile communications on a commercial (i.e., for profit) basis, while B/ILT radio systems serve a great variety of communications needs to support licensees' day-to-day business operations, safety, and emergency needs. Creation of a broadband segment for this band would help meet the stringent communications needs of the band's current users, especially electric utilities and other B/ILT eligibles. Moreover, in light of continuing evolutions in technology and the marketplace, the Commission believes that enabling broadband operations would address users' future needs and facilitate use of this band for next-generation technologies and services.

B. Legal Basis

4. The proposed action is authorized pursuant to sections 1, 2, 3, 4(i), 201, 301, 302, 303, 304, 307, 308, 309, 310, 319, 324, 332, and 333 of the Communications Act of 1934, as amended, 47 U.S.C. §§ 151, 152, 153, 154(i), 201, 301, 302a, 303, 304, 307, 308, 309, 310, 319, 324, 332, 333.

¹ See 5 U.S.C. § 603. The RFA, 5 U.S.C. §§ 601-612, has been amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA), Pub. L. No. 104-121, Title II, 110 Stat. 857 (1996).

² See 5 U.S.C. § 603(a).

³ *Id.*

C. Description and Estimate of the Number of Small Entities to Which the Proposed Rules Will Apply

5. The RFA directs agencies to provide a description of and, where feasible, an estimate of the number of small entities that may be affected by the proposed rules, if adopted.⁴ The RFA generally defines the term "small entity" as having the same meaning as the terms "small business," "small organization," and "small governmental jurisdiction."⁵ In addition, the term "small business" has the same meaning as the term "small business concern" under the Small Business Act.⁶ A small business concern is one which: (1) is independently owned and operated; (2) is not dominant in its field of operation; and (3) satisfies any additional criteria established by the SBA.⁷

6. *Small Businesses, Small Organizations, and Small Governmental Jurisdictions.* We propose to restrict eligibility to those entities that, after successful voluntary negotiations, are able to demonstrate, among other criteria, that they have reach agreement with all incumbent licensees to relocate from the 900 MHz broadband segment in a market. We also alternatively seek comment on an open eligibility standard for the auction of overlay licenses of the broadband segment, or an incentive auction. Our action in this proceeding may, over time, affect small entities that are not easily categorized at present. We therefore describe here, at the outset, three broad groups of small entities that could be directly affected herein.⁸ First, while there are industry specific size standards for small businesses that are used in the regulatory flexibility analysis, according to data from the SBA's Office of Advocacy, in general a small business is an independent business having fewer than 500 employees.⁹ These types of small businesses represent 99.9 percent of all businesses in the United States, which translates to 28.8 million businesses.¹⁰

7. Next, the type of small entity described as a "small organization" is generally "any not-for-profit enterprise which is independently owned and operated and is not dominant in its field."¹¹ Nationwide, as of August 2016, there were approximately 356,494 small organizations based on registration and tax data filed by nonprofits with the Internal Revenue Service (IRS).¹²

⁴ 5 U.S.C. § 603(b)(3).

⁵ 5 U.S.C. § 601(6).

⁶ 5 U.S.C. § 601(3) (incorporating by reference the definition of "small business concern" in 15 U.S.C. § 632). Pursuant to 5 U.S.C. § 601(3), the statutory definition of a small business applies "unless an agency, after consultation with the Office of Advocacy of the Small Business Administration and after opportunity for public comment, establishes one or more definitions of such term which are appropriate to the activities of the agency and publishes such definition(s) in the Federal Register."

⁷ 5 U.S.C. § 632 (1996).

⁸ See 5 U.S.C. § 601(3)-(6).

⁹ See SBA, Office of Advocacy, Frequently Asked Questions, Question 1—What is a small business? (2016), https://www.sba.gov/sites/default/files/advocacy/SB-FAQ-2016_WEB.pdf.

¹⁰ See SBA, Office of Advocacy, Frequently Asked Questions, Question 2—How many small businesses are there in the U.S.? (2016), https://www.sba.gov/sites/default/files/advocacy/SB-FAQ-2016_WEB.pdf.

¹¹ 5 U.S.C. § 601(4).

¹² Data from the Urban Institute, National Center for Charitable Statistics (NCCS) reporting on nonprofit organizations registered with the IRS was used to estimate the number of small organizations. Reports generated using the NCCS online database indicated that as of August 2016 there were 356,494 registered nonprofits with total revenues of less than \$100,000. Of this number, 326,897 entities filed tax returns with 65,113 registered nonprofits reporting total revenues of \$50,000 or less on the IRS Form 990-N for Small Exempt Organizations and 261,784 nonprofits reporting total revenues of \$100,000 or less on some other version of the IRS Form 990 within 24 months of the August 2016 data release date. See the NCCS Web Tools NCCS Nonprofits page, where the report showing this data can be generated by selecting the following data fields: Report: "The Number and Finances of All

(continued...)

8. Finally, the small entity described as a “small governmental jurisdiction” is defined generally as “governments of cities, counties, towns, townships, villages, school districts, or special districts, with a population of less than fifty thousand.”¹³ U.S. Census Bureau data from the 2012 Census of Governments¹⁴ indicate that there were 90,056 local governmental jurisdictions consisting of general purpose governments and special purpose governments in the United States.¹⁵ Of this number there were 37,132 General purpose governments (county,¹⁶ municipal and town or township¹⁷) with populations of less than 50,000 and 12,184 Special purpose governments (independent school districts¹⁸ and special districts¹⁹) with populations of less than 50,000. The 2012 U.S. Census Bureau data for most types of governments in the local government category show that the majority of these governments have populations of less than 50,000.²⁰ Based on this data we estimate that at least 49,316 local government jurisdictions fall in the category of “small governmental jurisdictions.”

9. *Wireless Telecommunications Carriers (except Satellite)*. This industry comprises establishments engaged in operating and maintaining switching and transmission facilities to provide communications via the airwaves. Establishments in this industry have spectrum licenses and provide services using that spectrum, such as cellular services, paging services, wireless internet access, and wireless video services.²¹ The appropriate size standard under SBA rules is that such a business is small if it has 1,500 or fewer employees.²² For this industry, U.S. Census data for 2012 show that there were 967 firms that operated for the entire year.²³ Of this total, 955 firms had employment of 999 or fewer

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Registered 501(c) Nonprofits”; Show: “Registered Nonprofits”; By: “Total Revenue Level (years 1995, Aug to 2016, Aug)”; and For: “2016, Aug” then selecting “Show Results.” See NCCS Nonprofits, <https://nccs.urban.org/sites/all/nccs-archive/html/tablewiz/tw.php> (last visited July 10, 2018).

¹³ 5 U.S.C. § 601(5).

¹⁴ See 13 U.S.C. § 161. The Census of Government is conducted every five (5) years compiling data for years ending with “2” and “7.” See also Program Description Census of Government, <https://factfinder.census.gov/faces/affhelp/jsf/pages/metadata.xhtml?lang=en&type=program&id=program.en.COG#> (last visited July 10, 2018).

¹⁵ See U.S. Census Bureau, Local Governments by Type and State: 2012 – United States -- States 2012 Census of Governments (Sept. 26, 2013), <https://factfinder.census.gov/bkmk/table/1.0/en/COG/2012/ORG02.US01>. Local governmental jurisdictions are classified in two categories - General purpose governments (county, municipal and town or township) and Special purpose governments (special districts and independent school districts).

¹⁶ See U.S. Census Bureau, County Governments by Population-Size Group and State: 2012 – United States -- States 2012 Census of Governments (Sept. 26, 2013), <https://factfinder.census.gov/bkmk/table/1.0/en/COG/2012/ORG06.US01>. There were 2,114 county governments with populations less than 50,000.

employees and 12 had employment of 1000 employees or more.²⁴ Thus under this category and the associated size standard, the Commission estimates that the majority of wireless telecommunications carriers (except satellite) are small entities.

10. *Private Land Mobile Radio Licensees – 900 MHz Band.* Private land mobile radio (PLMR) systems serve an essential role in a vast range of industrial, business, land transportation, and public safety activities. Companies of all sizes operating in all U.S. business categories use these radios. The 900 MHz band (896-901/935-940 MHz) is designated for narrowband PLMR communications by Business/Industrial/Land Transportation (B/ILT) licensees and for Specialized Mobile Radio (SMR) providers, with deployed systems primarily used for two-way communication by land transportation, utility, manufacturing, and petrochemical companies. Only B/ILT and SMR licensees are eligible to operate in the 900 MHz band. Currently, there are 420 B/ILT licensees and 42 SMR licensees who would be affected by our actions in this proceeding.

11. The SBA has not developed a small business size standard specifically applicable to PLMR – 900 MHz Band users. The closest applicable category is Wireless Telecommunications Carriers (except Satellite) which encompasses business entities engaged in *radiotelephone communications*.²⁵ The appropriate size standard for this category under SBA rules is that such a business is small if it has 1,500 or fewer employees.²⁶ For this industry, U.S. Census Bureau data for 2012 show that there were 967 firms that operated for the entire year.²⁷ Of this total, 955 firms had employment of 999 or fewer employees and 12 had employment of 1000 employees or more.²⁸ Thus, under this category and the associated size standard, the Commission estimates that the majority of PLMR-900 MHz Band licensees are small entities.

12. Pursuant to 47 C.F.R. § 90.814(b)(1), the Commission has established a small business size standard for purposes of auctioning 900 MHz SMR licenses as a firm that has had average annual gross revenues of \$15 million or less in the three preceding calendar years.²⁹ The SBA has approved this

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¹⁷ See U.S. Census Bureau, Subcounty General-Purpose Governments by Population-Size Group and State: 2012 - United States -- States 2012 Census of Governments (Sept. 26, 2013), <https://factfinder.census.gov/bkmk/table/1.0/en/COG/2012/ORG07.US01>. There were 18,811 municipal and 16,207 town and township governments with populations less than 50,000.

¹⁸ See U.S. Census Bureau, Elementary and Secondary School Systems by Enrollment-Size Group and State: 2012 - United States -- States 2012 Census of Governments (Sept. 26, 2013), <https://factfinder.census.gov/bkmk/table/1.0/en/COG/2012/ORG11.US01>. There were 12,184 independent school districts with enrollment populations less than 50,000.

¹⁹ See U.S. Census Bureau, 2012 Census of Governments, Special District Governments by Function and State: 2012 - United States -- States 2012 Census of Governments (Sept. 26, 2013), <https://factfinder.census.gov/bkmk/table/1.0/en/COG/2012/ORG09.US01>. The U.S. Census Bureau data did not provide a population breakout for special district governments.

²⁰ See U.S. Census Bureau, County Governments by Population-Size Group and State: 2012 - United States -- States 2012 Census of Governments (Sept. 26, 2013), <https://factfinder.census.gov/bkmk/table/1.0/en/COG/2012/ORG06.US01>; Subcounty General-Purpose Governments by Population-Size Group and State: 2012 - United States -- States 2012 Census of Governments (Sept. 26, 2013), <https://factfinder.census.gov/bkmk/table/1.0/en/COG/2012/ORG07.US01>; Elementary and Secondary School Systems by Enrollment-Size Group and State: 2012 - United States -- States 2012 Census of Governments (Sept. 26, 2013), <https://factfinder.census.gov/bkmk/table/1.0/en/COG/2012/ORG11.US01>. While U.S. Census Bureau data did not provide a population breakout for special district governments, if the population of less than 50,000 for this category of local government is consistent with the other types of local governments the majority of the 38, 266 special district governments have populations of less than 50,000.

²¹ U.S. Census Bureau, 2012 NAICS Definitions, 517210 Wireless Telecommunications Carriers (Except Satellite), <https://factfinder.census.gov/faces/affhelp/jsf/pages/metadata.xhtml?lang=en&type=ib&id=ib.en./ECN.NAICS2012.517210> (last visited July 10, 2018).

small business size standard for the 900 MHz auctions.³⁰ Consequently, we estimate that the majority of affected SMR authorizations are held by small entities.

13. The Commission has not developed a small business size standard specifically applicable to PLMR users in general, or for B/ILT licensees whose services fall under a larger category of PLMR services. We therefore rely on the SBA's size standard for Wireless Telecommunications Carriers (except Satellite) which encompasses business entities engaged in radiotelephone communications employing no more than 1,500 persons to assess the impact on B/ILT licensees.³¹ While relying on the SBA's size standard, we note that the Commission does not require PLMR licensees to disclose information about the number of employees and does not have information that could be used to determine exactly how many B/ILT licensees constitute small entities under this definition. Nevertheless, we estimate that the majority of affected B/ILT authorizations are held by small entities.

D. Description of Projected Reporting, Recordkeeping, and Other Compliance Requirements for Small Entities

14. The potential rule changes proposed in this *Notice*, if adopted, could impose new reporting, recordkeeping, or other compliance requirements on some small entities. In addition to the proposed rule changes associated with the proposed realignment of the 900 MHz band, there could also be new service rule compliance obligations. For the operations in the newly created 3/3 megahertz broadband segment, the *Notice* seeks comment on various service rules that should apply, including performance, construction, and technical operating requirements. Additionally, the *Notice* seeks comment on the costs and benefits of the proposed realignment approaches and any associated rule changes or requirements.

15. *Application Freeze.* In order to preserve the spectral landscape while this rulemaking proceeding is pending, the Wireless Telecommunications Bureau suspended acceptance and processing of

(Continued from previous page) _____

²² 13 CFR § 121.201, NAICS code 517210.

²³ U.S. Census Bureau, Information: Subject Series: Estab and Firm Size: Employment Size of Firms for the U.S.: 2012 Economics Census of the United States, (Jan. 08, 2016), https://factfinder.census.gov/bkmk/table/1.0/en/ECN/2012_US/51SSSZ5//naics~517210.

²⁴ *Id.* Available census data do not provide a more precise estimate of the number of firms that have employment of 1,500 or fewer employees; the largest category provided is for firms with “1000 employees or more.”

²⁵ U.S. Census Bureau, 2012 NAICS Definitions, “517210 Wireless Telecommunications Carriers (Except Satellite),” See <https://factfinder.census.gov/faces/affhelp/jsf/pages/metadata.xhtml?lang=en&type=ib&id=ib.en/ECN.NAICS2012.517210>.

²⁶ See 13 CFR § 121.201, NAICS code 517210.

²⁷ U.S. Census Bureau, *2012 Economic Census of the United States*, Table EC1251SSSZ5, Information: Subject Series: Estab and Firm Size: Employment Size of Firms for the U.S.: 2012 NAICS Code 517210. https://factfinder.census.gov/bkmk/table/1.0/en/ECN/2012_US/51SSSZ5//naics~517210.

²⁸ *Id.* Available census data do not provide a more precise estimate of the number of firms that have employment of 1,500 or fewer employees; the largest category provided is for firms with “1000 employees or more.”

²⁹ 47 CFR § 90.814(b)(1).

³⁰ See Letter to Tom Sugrue, Chief, Wireless Telecommunications Bureau, Federal Communications Commission, from Aida Alvarez, Administrator, Small Business Administration, dated August 10, 1999.

³¹ See 13 CFR § 121.201, NAICS code 517210.

applications for new or expanded use of 900 MHz B/ILT channels.³² To facilitate the transition to a 3/3 megahertz broadband segment, the *Notice* notes that the Commission would lift the freeze on B/ILT applications to allow incumbents to file applications necessary to effectuate relocation.

16. *Transition Mechanism.* The *Notice* proposes to permit a market-driven approach through voluntary exchanges between incumbents to effectuate band clearing and realignment and seeks comment on this proposal. The *Notice* also seeks comment on the alternatives of assigning by competitive bidding one overlay broadband license in each market area, where the winning broadband licensee in each market will have authority to operate on a primary basis with the right to relocate incumbents from the entire broadband segment, and the ability to operate a broadband network upon clearing the broadband segment. The *Notice* further seeks comment on the use of an incentive auction as an alternative transition mechanism.

17. *Applications.* In the *Notice*, we propose that an application filed with the Commission seeking a 900 MHz broadband license must include: (1) a certification that the applicant satisfies the eligibility restrictions (Eligibility Certification), and (2) a plan for transitioning the band in the particular county (Transition Plan) that describes the private agreements between the prospective broadband licensee and all covered incumbents. We also propose that the Eligibility Certification must list the licenses the applicant holds for all 20 SMR blocks, as well as the covered incumbents with which the applicant negotiated the Transition Plan for that county. Additionally, we propose that the Transition Plan must describe in detail all information and actions necessary to accomplish the realignment, including: (1) the spectrum frequencies within the broadband segment that the prospective broadband licensee seeks from Commission inventory, (2) the rights to all geographically-licensed SMR blocks, and any site-based SMR or B/ILT licenses in the county that the licensee is relinquishing, (3) the applications that the parties to the agreement will file for spectrum in the narrowband segment in order to relocate or repack licensees, (4) a description of how the applicant will provide interference protection to, and/or relocate from the broadband segment, all covered incumbents, and (5) any rule waivers or other actions necessary to implement the agreement. Small entities may require the expertise of engineers to analyze steps necessary to effectuate relocation to the narrowband segment, but we expect such tasks could be completed by engineering staff that already oversee their licensed operations and would not require small entities to hire additional staff. Similarly, while small entities may desire the advice of legal counsel in negotiating the Transition Plan, the Commission does not anticipate that such matters will be so complex as to require additional legal or regulatory compliance staff.

18. *Licensing and Operating Rules.* The Commission proposes to designate 900 MHz broadband service as a Miscellaneous Wireless Service and that broadband licensees in the 900 MHz broadband segment would be required to comply with licensing and operating rules that are applicable to all Part 27 services, including foreign ownership reporting,³³ renewal criteria,³⁴ permanent discontinuance of operations,³⁵ partitioning and disaggregation,³⁶ and spectrum leasing,³⁷ and seeks comment on this

³² See *Wireless Telecommunications Bureau Announces Temporary Filing Freeze on the Acceptance of Certain Part 90 Applications for 896-901/935-940 MHz (900 MHz Band) Spectrum*, Public Notice, DA 18-949 (WTB Sept. 13, 2018).

³³ 47 U.S.C. § 310; 47 CFR § 1.5000 *et seq.*

³⁴ 47 CFR § 1.949. We note the Commission recently amended several of the rules applicable to various geographically-licensed wireless radio services. See *Amendment of Parts 1, 22, 24, 27, 74, 80, 90, 95, and 101 To Establish Uniform License Renewal et al.*, Second Report and Order and Further Notice of Proposed Rulemaking and Order, 32 FCC Rcd 8874 (2017) (*WRS Renewal Reform 2nd R&O and FNPRM*).

³⁵ 47 CFR § 1.953.

³⁶ *Id.* § 1.950.

³⁷ *Id.* § 1.9001 *et seq.*

approach.

19. *Performance Requirements.* The *Notice* seeks comment and proposes to require a 900 MHz broadband licensee to provide reliable signal coverage and offer service to at least forty-five (45) percent of the population in each of its license areas within six years of the license issue date (first performance benchmark), and to at least eighty (80) percent of the population in each of its license areas within 12 years from the license issue date (second performance benchmark). The *Notice* also proposes to require the broadband licensee to deploy broadband technologies and offer broadband services under a voluntary exchange mechanism and seeks comment on whether that requirement should be adopted where, in the alternative or in combination, licenses are issued through competitive bidding. Further, recognizing the potential use of the 900 MHz broadband segment by private wireless users such as electric utilities or other B/ILT eligibles, the *Notice* seeks comment on whether alternative metrics may be necessary to accommodate such users. Similarly, the *Notice* recognizes that 900 MHz broadband licensees would have the flexibility to provide services that are potentially less suited to a population coverage metric, such as Internet of Things type services, and seeks comment on potential alternatives to a population-based benchmark that could account for such uses.

20. Along with performance benchmarks, the *Notice* seeks comment and proposes penalties it believes will most effectively ensure timely buildout. Specifically, the *Notice* proposes that, in the event a 900 MHz broadband licensee fails to meet the first performance benchmark, the licensee's second benchmark and license term would be reduced by two years, thereby requiring it to meet the second performance benchmark two years sooner (at 10 years into the license term) and reducing its license term to 13 years. The *Notice* proposes that, in the event a 900 MHz broadband licensee fails to meet the second performance benchmark for a particular license area, its authorization for each license area in which it fails to meet the performance requirement shall terminate automatically without Commission action.

21. The proposed performance benchmarks would apply to any small entity that obtains a new 3/3 megahertz broadband license. Given the proposal to require that the prospective broadband licensee hold the existing licenses for all 20 geographically-licensed SMR blocks, we anticipate the new broadband licensee will have existing operations in, and be familiar with, the 900 MHz band. While the prospective broadband licensee may already have the engineering staff and expertise necessary to provide existing narrowband services in the 900 MHz band, given the proposal to require broadband services for the purposes of satisfying performance benchmarks, the new licensee may need to hire additional staff to ensure compliance with those requirements.

22. *Compliance Procedures.* In addition to compliance procedures applicable to all Part 27 licensees, including the filing of electronic coverage maps and supporting documentation, the *Notice* proposes that such electronic coverage maps must accurately depict the boundaries of each license area in the licensee's service territory. If a licensee does not provide reliable signal coverage to an entire license area, the *Notice* proposes that its map must accurately depict the boundaries of the area or areas within each license area not being served. Further, the *Notice* proposes that each licensee also must file supporting documentation certifying the type of service it is providing for each licensed area within its service territory and the type of technology used to provide such service. Supporting documentation must include the assumptions used to create the coverage maps, including the propagation model and the signal strength necessary to provide reliable service with the licensee's technology. The proposed compliance procedures are consistent with existing procedures for Part 27 and Part 90 services, and would likely not require additional staffing for small entities that are existing operators. For small entities that are not existing operators and do not have existing staffing dedicated to regulatory compliance, engineering and legal expertise may be necessary for the purposes of making the requisite filings and demonstrating compliance with the proposed performance obligations.

23. *Renewal Term Construction Obligations.* The *WRS Renewal Reform FNPRM* proposed

to apply rules adopted in that proceeding to all flexible geographic licenses.³⁸ Given the proposal to license this band on a geographic basis for flexible use, any additional renewal term construction obligations proposed in the *WRS Renewal Reform FNPRM* also would apply to licenses in the 900 MHz broadband spectrum. Accordingly, the *Notice* seeks comment on whether there are unique characteristics of the 900 MHz broadband spectrum that might require a different approach than the various proposals raised by the *WRS Renewal Reform FNPRM*.

24. *Competitive Bidding Procedures.* As an alternative option under consideration, the *Notice* seeks comment on, consistent with the competitive bidding procedures used in previous auctions, conducting auctions for licenses in the 900 MHz broadband spectrum in conformity with the general competitive bidding rules set forth in Part 1, subpart Q, of the Commission's rules.³⁹ Specifically, the *Notice* seeks comment on employing the Part 1 rules governing competitive bidding design, designated entity preferences, unjust enrichment, application and certification procedures, payment procedures, reporting requirements, and the prohibition on certain communications between auction applicants. Under this proposal, such rules would be subject to any modifications that the Commission may adopt for its Part 1 general competitive bidding rules in the future.⁴⁰ The *Notice* seeks comment on whether any of our Part 1 rules or other competitive bidding policies would be inappropriate or should be modified for an auction of licenses in this frequency band.

25. *Technical Rules.* Currently, 900 MHz base stations are limited to an effective radiated power (ERP) not to exceed 1 kilowatt (30 dBw) and an antenna height above average terrain (HAAT) not to exceed 304 meters (1,000 feet), with the maximum permissible power decreasing as the HAAT rises above 304 meters. In a number of recent proceedings, the Commission has applied the power spectral density (PSD) concept when adopting transmission power limits, so as to take into account the availability and deployment of advanced mobile technologies, such as Long Term Evolution (LTE). The *Notice* seeks comment and proposes to permit an ERP for base and repeater stations in the broadband segment not to exceed 400 watts/megahertz in non-rural areas and 800 watts/megahertz in rural areas, with the maximum permissible power decreasing as the HAAT rises above 304 meters. The *Notice* notes that future broadband licensees in the 900 MHz band would be subject to any new or modified international agreements governing border-area operations.

26. The *Notice* proposes to make broadband segment licensees responsible for resolving any harmful interference to narrowband operations in the shortest time practicable, and seeks comment on the appropriate standards to protect co-channel narrowband licensees from broadband operations. The *Notice* seeks comment on whether existing minimum spacing criteria applicable to 900 MHz broadband base station operations would be a sufficient means of providing interference protection. Additionally, the *Notice* seeks comment on the Commission's existing definition of harmful interference as a median desired signal strength of -88 dBm or higher as measured at the radiofrequency input of the receiver of a mobile unit, or -85 dBm or higher as measured at the radiofrequency input of the receiver of a portable station, as well as one commenter's proposal to define harmful interference as receiving a median desired signal strength of -98 dBm or higher as measured at the radiofrequency (RF) input of the receiver of a mobile unit, or -95 dBm or higher as measured at the RF input of the receiver of a portable station (hand-held device). The *Notice* asks commenters to discuss whether these criteria are appropriate, or whether the Commission should adopt technical standards and procedures that more closely align with the existing

³⁸ *WRS Renewal Reform 2nd R&O and FNPRM*, 32 FCC Rcd at 8915, paras. 111-12.

³⁹ See 47 CFR §§ 1.2101-1.2114.

⁴⁰ In its most recent amendments to the Part 1 competitive bidding rules, the Commission, among other things, updated the standardized schedule of small business size standards, instituted a rural service provider bidding credit, and adopted a process by which we may establish a reasonable monetary limit or cap on the total amount of bidding credits that an eligible small business or rural service provider may be awarded in a particular auction. *Competitive Bidding Update Report & Order*, 30 FCC Rcd at 7530-31, para. 88, 7539-48, paras. 109-30.

rules regarding unacceptable interference to non-cellular 800 MHz licensees from 800 MHz cellular systems or part 22 Cellular Radiotelephone systems, and within the 900 MHz B/ILT Pool.

27. The *Notice* proposes to place a 3/3 megahertz broadband license at 897.5-900.5 MHz/936.5-939.5 MHz, which would create 500 kilohertz of separation between broadband operations and Narrowband Personal Communications Service operations, protecting Narrowband Personal Communications Service users from harmful interference and creating greater separation between collocated narrowband systems. Additionally, the *Notice* proposes to establish an out-of-band emission (OOBE) limit outside a licensee's frequency band of operation to be attenuated by at least $43 + 10 \log (P)$ dB for uplink operations in the 896-901 MHz band and by at least $50 + 10 \log (p)$ dB for downlink operations in the 935-940 MHz band. The Commission believes this more stringent asymmetrical emission mask will further protect Narrowband Personal Communications Service users from OOBE and seeks comment on this assumption.

28. The *Notice* also proposes to establish a median field strength limit of 40 dBuV/m at any given point along the geographic license area boundary in the broadband segment, unless the affected licensees agree to a higher field strength limit. This corresponds to the current field strength limit at the border between co-channel 900 MHz SMR licensees. The Commission seeks comment on these proposals, specifically whether these proposed technical rules and parameters would be sufficient to prevent disruption to low-latency, high-reliability utility operations of adjacent narrowband systems.

29. The proposed technical rules largely mirror existing Part 90 technical rules, and small entities that are existing operators would likely already have staff with the requisite expertise to ensure compliance. For small entities that are not existing operators and do not have existing staffing dedicated to tailoring technical systems, engineering expertise may be necessary for the purposes of making ensuring compliance with the proposed technical parameters and interference protection criteria.

E. Steps Taken to Minimize the Significant Economic Impact on Small Entities, and Significant Alternatives Considered

30. The RFA requires an agency to describe any significant alternatives that it has considered in developing its approach, which may include the following four alternatives (among others): "(1) the establishment of differing compliance or reporting requirements or timetables that take into account the resources available to small entities; (2) the clarification, consolidation, or simplification of compliance or reporting requirements under the rule for small entities; (3) the use of performance rather than design standards; and (4) an exemption from coverage of the rule, or any part thereof, for small entities."⁴¹

31. The proposals contained in the *Notice* are designed to enable broadband operations in the 900 MHz band to facilitate use of this band for next-generation technologies and services. This action is critical to the continuation of technological advancement, furthers the goals of the Telecommunications Act of 1996, and serves the public interest. We are likewise committed to ensuring that the disruption to incumbent operations, and the economic impact of this proceeding on both incumbent licensees and new broadband licensees, is minimal. The Commission has taken steps to enable it to minimize the economic burden on small entities that could occur if some of the rule changes or approaches proposed in the *Notice* are adopted. Specifically, in the *Notice*, the Commission seeks to identify whether small entities face any special or unique issues with respect to the proposed licensing and operating rules such that they would require certain accommodations or additional time to comply by seeking comment on this issue. The Commission also seeks comment on modifications that could be made to our rules regarding administrative processes that would reduce the economic impacts of proposed rule changes on small entities. Seeking comment specifically targeting small entities should provide the Commission with the requisite data to consider the most cost-effective approach to minimize the economic impact for such entities while achieving its statutory objectives.

⁴¹ See 5 U.S.C. § 603(c)(1)-(4).

32. In order to minimize the economic impact resulting from the proposed rules on small entities and other licensees in the 900 MHz band, the technical rules applicable to operations in the two narrowband segments would remain unchanged. In other words, despite the creation of the 3/3 megahertz broadband segment, 900 MHz narrowband B/ILT and SMR uses would operate under the same technical rules as today and would not impose any additional economic impact for small entities. In addition, since we propose to rely on voluntary mechanisms to facilitate clearing of the 3/3 megahertz broadband segment, if any incumbent chooses not to relocate, it would remain subject to the same technical rules as it is today, and a broadband licensee would be responsible to protect the incumbent's operations from harmful interference indefinitely.

33. Only broadband licensees would be required to comply with the new proposed rules. Because we are cognizant that small entities must allocate resources carefully over the length of their license term and have more limited funds should they be required to compete at auction for a particular license, the *Notice* proposes to apply a 15-year license term for broadband licenses. The certainty of a longer license term would provide broadband licensees who are small entities sufficient incentive to make the long-term investments necessary for compliance.

34. Additionally, we also recognize that a smaller geographic area for the broadband license—such as MSAs, counties, etc.—might better align with the interests of licensees who are small entities and operate in smaller areas. Using a smaller broadband license size could provide an opportunity for small 900 MHz licensees to obtain directly a broadband license to meet their broadband needs. Recognizing that these alternatives may benefit small entities, the *Notice* seeks comment on the alternatives and asks commenters to discuss specific advantages and disadvantages of using a smaller geographic area for the broadband license.

35. Another alternative on which the *Notice* seeks comment is the adoption of bidding credits for small businesses and rural service providers in any auction of spectrum in the 900 MHz broadband segment. The Commission administers these bidding credit programs to promote small business and rural service provider participation in auctions and in the provision of spectrum-based services. Based on our analysis of past auction data, the relative costs of participation are lowered for small businesses that take full advantage of the bidding credit programs.

36. The Commission finds an overriding public interest in encouraging investment in wireless networks, facilitating access to scarce spectrum resources, and promoting the rapid deployment of mobile services to Americans. All licensees, including small entities, play a crucial role in achieving these goals. Thus, to identify additional approaches that could further minimize the economic impact on small entities the Commission seeks comment on alternative obligations, timing for implementation, scope of subject licenses, and other measures that could accommodate the needs and resources of small entities. Prior to adopting final rules in this proceeding, the Commission will evaluate comments filed in response to the *Notice*, and carefully consider these matters and the impact of all rule changes on small entities.

F. Federal Rules that May Duplicate, Overlap, or Conflict with the Proposed Rules

37. None.