

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

In the Matter of)
Amendment of Part 90 of the Commission's Rules) WP Docket No. 07-100
Implementing a Nationwide, Broadband,) PS Docket No. 06-229
Interoperable Public Safety Network in the 700)
MHz Band)
Service Rules for the 698-746, 747-762 and 777-) WT Docket No. 06-150
792 MHz Bands)

FOURTH REPORT AND ORDER AND
FIFTH FURTHER NOTICE OF PROPOSED RULEMAKING

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Reply Comment Date: (90 days after publication in the Federal Register).

By the Commission:

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I. INTRODUCTION AND BACKGROUND

1. In this Fourth Report and Order and Fifth Further Notice of Proposed Rulemaking (*Fourth Report and Order* and *Fifth Further Notice*, respectively), we first adopt rule changes to Part 90 of the Commission’s rules pertaining to public safety operations in the 4940-4990 MHz (4.9 GHz) band to clarify, as well as correct certain provisions in the technical rules and several entries in the Public Safety Pool Frequency Table and associated list of limitations. We next seek comment on specific proposals designed to establish appropriate frequency coordination procedures for 4.9 GHz operations and to encourage improved spectrum efficiency and greater use of the 4.9 GHz band. These steps are part of our continuing effort to provide clear and concise rules that facilitate and promote the deployment of new wireless technologies, devices and services.¹ In addition, given directives in the Middle Class Tax Relief and Job Creation Act of 2012 (“Spectrum Act”)² to develop a nationwide interoperable public safety broadband network, we invite comment on how the 4.9 GHz band can best be used to complement this network.

2. In April 2009, the Commission released the *Report and Order and Further Notice of Proposed Rulemaking* (*Report and Order* and *Further Notice*, respectively) to “encourag[e] public safety users to more fully utilize the 4.9 GHz band” for broadband communications.³ In the *Report and Order*, the Commission amended Part 90 of the Commission’s rules to permit licensing in the 4.9 GHz band, on a primary basis, of permanent fixed links used to deliver broadband services.⁴ In the *Further Notice*, the Commission proposed (1) to reinstate a provision that had previously exempted 4.9 GHz band applicants from certified frequency coordination,⁵ (2) to require instead that applicants for 4.9 GHz primary permanent fixed stations complete the formalized licensee-to-licensure coordination process established in

¹ See, e.g., 1998 Biennial Regulatory Review – 47 C.F.R. Part 90 – Private Land Mobile Radio Services, WT Docket No. 98-182, *Report and Order and Further Notice of Proposed Rule Making*, 15 FCC Rcd 16673 (2000) (*Biennial Review R&O*); see also Biennial Regulatory Review – Amendment of Parts 1, 22, 24, 27 and 90 to Streamline and Harmonize Various Rules Affecting Wireless Radio Services, WT Docket No. 03-264, *Notice of Proposed Rulemaking*, 19 FCC Rcd 708 (2004).

² Pub. L. No. 112-96, 126 Stat. 156 (2012).

³ See Amendment of Part 90 of the Commission’s Rules, WP Docket No. 07-100, *Report and Order and Further Notice of Proposed Rulemaking*, 24 FCC Rcd 4298, 4304 ¶ 10 (2009) (*Report and Order* and *Further Notice*, respectively).

⁴ See *Report and Order* at 4303 ¶ 9. Subsequently, the Public Safety and Homeland Security Bureau established a new station class code, “FXB,” and provided instructions for licensing 4.9 GHz primary permanent fixed stations. See Public Safety and Homeland Security Bureau Establishes a New Station Class Code and Provides Licensing Instructions for Primary Permanent Fixed Stations in the 4940-4990 MHz Band Allocated for Public Safety Use, *Public Notice*, 24 FCC Rcd 14313 (PSHSB 2009).

⁵ See *Further Notice*, 24 FCC Rcd at 4316-4317 ¶ 43.

Part 101 for fixed microwave stations,⁶ (3) to correct an error in the band plan for the 4.9 GHz band and clarify how channels may be aggregated, and (4) to correct additional errors in the Public Safety Pool Frequency Table and associated list of limitations.⁷

3. The Commission received five comments and two reply comments in response to the *Further Notice*.⁸ None of the commenters raised any question about these proposals, with the exception of the proposed licensee-to-licensee coordination process, for which a majority of commenters proposed database and registration approaches as alternatives. By this *Fourth Report and Order*, we adopt the proposals from the *Further Notice* except for the licensee-to-licensee coordination process. In order to permit further comment on proposals for coordination, we further explore 4.9 GHz coordination in the *Fifth Further Notice*. The *Fifth Further Notice* also seeks additional comment on the information we received at the February 25, 2011, 4.9 GHz Workshop hosted by the Commission on several issues, including not only coordination but also eligibility, licensing, band plan, power and antenna gain, aeronautical mobile use, and standards.⁹

4. We also seek further comment on how public safety use of the 4.9 GHz band can best promote the long-established goal of establishing a nationwide public safety broadband network operating in the 700 MHz band. As we observed in the *Fourth Further Notice of Proposed Rulemaking (Fourth FNPRM)* in this proceeding, while the 700 MHz band contemplated for this network is allocated for mobile use, public safety broadband networks also have a critical need for fixed uses, such as for surveillance and backhaul capacity, and that public safety entities are currently using the 4.9 GHz band for such uses.¹⁰ Accordingly, the Commission sought comment on several 4.9 GHz issues, including how 4.9 GHz band networks could complement 700 MHz public safety broadband networks.¹¹

5. The Spectrum Act, enacted on February 22, 2012, has provided the road map for deployment of the nationwide interoperable public safety broadband network contemplated by the Commission in the *Fourth FNPRM*. Section 6101 of the Spectrum Act directs the Commission to reallocate the 700 MHz “D Block” (758-763 MHz/788-793 MHz) for public safety services.¹² Section 6201 of the Act requires the Commission to assign a license for both the D Block and the existing public

⁶ See *id.* at 4317 ¶ 45.

⁷ See *id.* at 4318-4319 ¶¶ 46-52.

⁸ The commenters, and the abbreviations or acronyms used to refer to them herein, are listed in Appendix A. Because New Orleans filed comments that are not responsive to the *Further Notice* but rather to the *Notice of Proposed Rulemaking*, which was resolved by the *Report and Order*, we find no reason to consider its comments here. See New Orleans Comments; Amendment of Part 90 of the Commission’s Rules, *Notice of Proposed Rulemaking and Order*, WP Docket No. 07-100, 22 FCC Rcd 9595 (2007).

⁹ See Federal Communications Commission Announces Agenda for Workshop on the 4.9 GHz Band: Spectrum Dedicated to Public Safety for Broadband Use, *Public Notice* (rel. Feb. 17, 2011). See full video of the 4.9 GHz Workshop at <http://www.youtube.com/fccdotgovvideo#p/search/0/mZmtU9atyeY> (4.9 GHz Workshop Video).

¹⁰ 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; WT Docket No. 06-150, PS Docket No. 06-229, WP Docket No. 07-100, *Third Report and Order and Fourth Further Notice of Proposed Rulemaking*, 26 FCC Rcd 733, 768 ¶ 130 (2011) (*Third Report and Order* and *Fourth FNPRM*, respectively).

¹¹ See *id.* at 769 ¶ 131.

¹² Spectrum Act § 6101.

safety broadband spectrum (763-769 MHz/793-799 MHz) to the First Responder Network Authority (FirstNet), an independent authority within the National Telecommunications and Information Administration (NTIA).¹³ The Spectrum Act also establishes a Public Safety Trust Fund, with \$7 billion available for buildout of the new network.¹⁴ The *Fifth Further Notice* seeks comment about how the new statutory framework for the public safety broadband network should affect public safety operations in the 4.9 GHz band, and whether FirstNet is or should be eligible for a 4.9 GHz band license.

II. FOURTH REPORT AND ORDER

6. In this *Fourth Report and Order*, we adopt rule changes to three aspects of the technical provisions of Part 90 of the Commission's rules pertaining to public safety operations. All of these changes are designed to correct typographical or other ministerial errors in these provisions. First, we reinstate a rule provision, formerly codified at Section 90.175(j)(17) of the Commission's rules but inadvertently deleted in 2004, that exempted 4.9 GHz band applicants from certified frequency coordination. Next, we correct the bandwidth of Channel 14 in the 4.9 GHz band plan from five megahertz to one megahertz, and amend the band plan to list the center frequencies for each channel aggregation permitted in the rules. Finally, we correct minor errors in the Public Safety Pool Frequency Table and associated list of limitations. These changes will improve spectrum efficiency and clarify provisions of the rules so as to encourage greater use of the 4.9 GHz band. Their costs are negligible, because they would impose no apparent investment or expenditure requirements on any affected entities to achieve compliance.

A. 4.9 GHz General Exemption from Certified Frequency Coordination

7. In the *Further Notice*, the Commission sought comment on its proposal to amend Section 90.175(j) of the Commission's rules¹⁵ to restore an exemption for applications for 4.9 GHz band frequencies from certified frequency coordination requirements.¹⁶ The rationale for this exemption had been that all of these frequencies are subject to shared use and thus already require cooperation and coordination under the Commission's rules.¹⁷ The Commission tentatively concluded that an unrelated rulemaking had overwritten this exemption in 2004 by ministerial error.¹⁸

¹³ Spectrum Act §§ 6201, 6204. NTIA has not yet established FirstNet as of the release of this *Fourth Report and Order* and *Fifth Further Notice*.

¹⁴ *Id.* § 6413(b)(3).

¹⁵ 47 C.F.R. § 90.175(j).

¹⁶ See *Further Notice*, 24 FCC Rcd at 4317 ¶ 43. The exemption appeared under 47 C.F.R. § 90.175(j)(17) (2003). In 2004, the Commission revised Section 90.175 by removing subparagraph (j)(13) and redesignating subparagraphs (j)(14) through (17) as (j)(13) through (16). See 69 Fed. Reg. 39,867 (July 1, 2004). The 4.9 GHz exemption appeared under 47 C.F.R. § 90.175(j)(16) as a result.

¹⁷ See *Further Notice*, 24 FCC Rcd at 4315 ¶ 41. See also 47 C.F.R. § 90.1209(b).

¹⁸ See *Further Notice*, 24 FCC Rcd at 4316 ¶ 42. The Commission found that Federal Register publication of a Report and Order on the Dedicated Short-Range Communications Services had inadvertently overwritten the 4.9 GHz exemption in Section 90.175(j)(16). See Amendment of the Commission's Rules Regarding Dedicated Short-Range Communication Services in the 5.850-5.925 GHz Band (5.9 GHz Band), Amendment of Parts 2 and 90 of the Commission's Rules to Allocate the 5.850-5.925 GHz Band to the Mobile Service for Dedicated Short Range Communications of Intelligent Transportation Services, *Report and Order*, WT Docket No. 01-90, ET Docket No. 98-95, 19 FCC Rcd 2458, Appendix A, 2503 ¶ 8 (2003); 69 Fed. Reg. 46,438 (Aug. 3, 2004).

8. Harris Corporation (Harris) and the National Public Safety Telecommunications Council (NPSTC) filed comments in support of restoring the exemption.¹⁹ Harris states that “[c]ertification of coordination is unnecessary given local government’s interest in maximizing use and avoiding interference among its various public safety agencies.”²⁰ Harris further notes that “as more public safety communications planning (particularly with regard to interoperable communications like that envisioned for the 4.9 GHz band) is done at the state level, there is inherently more state and local-government coordination amongst public safety agencies.”²¹ As the Commission observed in the *Further Notice*, the omission has been in effect for a substantial period of time, and some entities may be operating under the assumption that formal coordination from a certified frequency coordinator is required for 4.9 GHz applications.²² Given the inadvertent nature of the deletion of this provision from the rules, and the lack of comments objecting to its reinstatement, we reinstate the provision exempting 4.9 GHz band applicants from certified frequency coordination requirements. For the reasons identified by Harris, clarifying our existing rule has clear benefits, and we do not currently believe that the benefits associated with unintended certified frequency coordination procedures outweigh their costs to public safety entities. Notwithstanding the exemption from certified frequency coordination requirements, however, we continue to believe, as we noted in the *Further Notice*, that “additional measures are required to minimize the potential for interference.”²³ Accordingly, we explore possible additional coordination requirements in the *Fifth Further Notice*, including those advanced by commenters in response to the *Further Notice*.

B. 4.9 GHz Band Plan Correction and Clarification

9. The Commission also sought comment on a proposal to correct the bandwidth for channel number 14 in Section 90.1213 of the Commission’s rules from five megahertz to one megahertz.²⁴ The original designation of five megahertz bandwidth to channel 14 in the Commission’s rules appears to have been a ministerial error, as it renders the band plan asymmetrical and is the only channel in the band plan that has bandwidth overlap with the adjacent channels. In the *Further Notice*, the Commission noted that this correction would eliminate bandwidth overlap with adjacent channels, improve spectrum efficiency, restore symmetry to the band plan, and reflect the correct allocation between one-megahertz and five-megahertz channels that the Commission had actually specified in the *4.9 GHz Third Report and Order*.²⁵ The Commission further proposed to grandfather existing licensees to minimize the effect of this clarification on existing operations.²⁶ Also, for the purpose of clarifying channel centers for various channel aggregations, the Commission sought comment on a proposal to amend the table in Section 90.1213 to list the center frequencies that should be requested on applications,

¹⁹ See Harris Comments at 4; NPSTC Comments at 9-10.

²⁰ Harris Comments at 4.

²¹ *Id.*

²² *Further Notice*, 24 FCC Rcd 4316-7 ¶ 43.

²³ *Id.* at 4317 ¶ 44.

²⁴ See *id.*, 24 FCC Rcd at 4319 ¶ 47. See also 47 C.F.R. § 90.1213.

²⁵ See *Further Notice*, 24 FCC Rcd at 4319 ¶ 47. See also *The 4.9 GHz Band Transferred from Federal Government Use*, WT Docket No. 00-32, *Memorandum Opinion and Order and Third Report and Order*, 18 FCC Rcd 9152, 9168 ¶ 39 (2003) (*4.9 GHz Third Report and Order*).

²⁶ See *Further Notice*, 24 FCC Rcd at 4319 ¶ 47.

for every possible channel aggregation permitted in the rules.²⁷ NPSTC expressed support for this proposal,²⁸ and no parties opposed it.

10. Because the Commission's proposed clarification for Section 90.1213 would correct a discrepancy in the codification of the rule, and the amended table will help 4.9 GHz applicants specify on their applications the correct center frequency for any given channel aggregation as permitted in the rules, we adopt these two changes to the 4.9 GHz band plan. We grandfather any existing licensees that are authorized for greater than one megahertz bandwidth on channel 14 or for non-standard center frequencies. This will relieve existing licensees from burdens and costs that would be required to comply with these changes. Since the 4.9 GHz band is lightly used today relative to other public safety bands, we do not believe that grandfathering will cause significant problems, which could include cases of mutual bandwidth overlap interference between existing licensees on channel 14 with five megahertz bandwidth and licensees on adjacent channels.

C. Public Safety Pool Corrections

11. The Commission also sought comment on a proposal to implement three amendments to correct ministerial errors in the Public Safety Pool Frequency Table and associated list of limitations, each of which would clarify our rules and eliminate the potential for confusion. As none of these three amendments was opposed, we thus adopt each of them. None of the changes will restrict or limit licensee operation beyond what is currently authorized by our rules, and thus we find no need to grandfather incumbent licensees from the effect of any of them.

12. First, in the Section 90.20(d)(66)(i) table of frequency pairs, the Commission proposed to correct the mobile-only frequency for Channel MED-4 from 463.075 MHz to 468.075 MHz.²⁹ We confirm our tentative conclusion that the current rule reflects a typographical error. The error is evidenced by the absence of any rule change to explain it and the fact that all other mobile only frequencies in this table are in the 468 MHz range while the listed frequency at issue here (463.075 MHz) already appears in the "Frequencies base and mobile (megahertz)" column of the table.³⁰

13. Second, in the Section 90.20(c)(3) table of Public Safety Pool frequencies, the Commission proposed to replace limitation 38 with limitation 10 on nine medical service frequencies.³¹ In 2005, the Commission issued an order that, *inter alia*, replaced limitation 38 with limitation 10 in the Public Safety Pool Frequency Table³² because the two limitations were identical.³³ Today, limitation 38

²⁷ *Id.* at 4319 ¶ 48.

²⁸ NPSTC Comments at 9-10.

²⁹ *See Further Notice*, 24 FCC Rcd at 4320 ¶ 50. *See also* 47 C.F.R. § 90.20(d)(66)(i).

³⁰ *See* 47 C.F.R. § 90.20(d)(66)(i).

³¹ *Further Notice*, 24 FCC Rcd at 4320 ¶ 51. The nine frequencies with limitation 38 are: 462.950, 467.950, 467.95625, 467.9625, 467.96875, 467.975, 467.98125, 467.9875 and 467.99375 MHz.

³² *See* Biennial Regulatory Review - Amendment of Parts 1, 22, 24, 27, and 90 to Streamline and Harmonize Various Rules Affecting Wireless Radio Services, *Report and Order and Further Notice of Proposed Rulemaking*, WT Docket No. 03-264, 20 FCC Rcd 13900 (2005) (2005 Biennial Review R&O).

³³ *See* 47 C.F.R. §§ 90.20(d)(10), (38) (2005). In 2005, both limitations read: "A licensee regularly conducting two-way communication operations on this frequency may, on a secondary basis, also transmit one-way alert-paging signals to ambulance and rescue squad personnel." *Id.*

is “reserved” and thus devoid of any actual regulation,³⁴ but the Commission never has completed the limitation replacement in the table of frequencies. Today’s action will correct this oversight.³⁵

14. Third, the Commission proposed to amend Section 90.20(c)(3) by replacing the text in the limitation column “O=’xl’≤72” for the 1427 to 1432 MHz band with the numeral “72.”³⁶ As explained in the *Further Notice*, this correction will clarify our intention to apply limitation 72 to this band.

15. After further scrutiny of the Public Safety Pool Frequency Table, we identified another typographical error in the table not previously identified in the *Further Notice*. In the original 2007 *Notice of Proposed Rulemaking and Order* in WP Docket No. 07-100, the Commission made “certain minor editorial amendments to Part 90 to correct errors or omissions of publication, eliminate duplicative language, or conform language among rule sections.”³⁷ Among these changes, the Commission deleted “obsolete references to Section 90.20(d)(60) and (61).”³⁸ However, when the Commission deleted limitations 60 and 61 for frequencies 453.03125 and 453.04375 MHz in the Public Safety Pool Frequency Table, the Commission also changed limitation number 59 to 49 on these frequencies without explanation.³⁹ These additional changes were the result of typographical errors. Limitation 49 states that “[t]his frequency may be assigned only for forest firefighting and conservation activities in accordance with the provisions of § 90.265,”⁴⁰ but frequencies 453.03125 and 453.04375 MHz do not appear in that section.⁴¹ In contrast, limitation 59 states that “[t]he continuous carrier mode of operation may be used for telemetry transmission on this frequency.”⁴² The telemetry focus of limitation 59 is consistent with limitation 62, which also applies to these frequencies.⁴³ We take this opportunity to correct these errors and change limitation number 49 back to 59 on these frequencies. Because we are merely correcting a typographical error to restore the original language of the rule, we find for good cause that prior notice and comment on the correction are unnecessary.⁴⁴

³⁴ See 47 C.F.R. § 90.20(d)(38).

³⁵ In the *Further Notice*, we also pointed out an inadvertent reference in the final rule appendix to frequency 462.9375 MHz, which does not in fact have limitation 38. See *Further Notice*, 24 FCC Rcd at 4319 ¶ 51. Since the rules as codified do not include limitation 38 for this frequency, no correction is needed with respect to it. 47 C.F.R. § 90.20(c)(3).

³⁶ See *Further Notice*, 24 FCC Rcd at 4319 ¶ 52.

³⁷ Amendment of Part 90 of the Commission’s Rules, WP Docket No. 07-100, *Notice of Proposed Rulemaking and Order*, 22 FCC Rcd 9595, 9608 ¶ 30 (2007).

³⁸ *Id.*

³⁹ See *id.*, 22 FCC Rcd at 9621. Cf. 47 C.F.R. § 90.20(c)(3) (2006) (previous version of codified rule referred to limitation 59, not limitation 49).

⁴⁰ 47 C.F.R. § 90.20(d)(49).

⁴¹ See 47 C.F.R. § 90.265.

⁴² 47 C.F.R. § 90.20(d)(59).

⁴³ 47 C.F.R. § 90.20(d)(62). Limitation 62 states in part, “This frequency is also authorized for use by biomedical telemetry stations.” *Id.*

⁴⁴ See 5 U.S.C. § 553(b)(B).

III. FIFTH FURTHER NOTICE OF PROPOSED RULEMAKING

16. In 2002, when the Commission allocated the 4.9 GHz band for fixed and mobile services in support of public safety, it envisioned that the band would support new broadband applications such as high-speed digital technologies and wireless local area networks (WLANs) for incident scene management, dispatch operations, and vehicular/personal communications.⁴⁵ This allocation responded to new national priorities focusing on homeland security, and was designed “to transition to an environment in which the public safety community enjoys maximum access to emerging broadband technologies.”⁴⁶ The Commission’s allocation gained extensive support by first responders, the National Public Safety Telecommunications Council (NPSTC), and others asserting that the public safety community was in great need of additional spectrum to meet their critical operations needs, and that the 4.9 GHz band was ideal for these emerging broadband technologies.⁴⁷

17. Notwithstanding the Commission’s action to accord primary status to broadband permanent fixed point-to-point links in 2009,⁴⁸ we believe that the development of the 4.9 GHz band, to date, has fallen short of its potential.⁴⁹ We therefore take this opportunity to reevaluate our existing policies and to consider new approaches to spur robust and efficient use in this band. Toward that end, we seek comment on a number of important issues. First, we solicit views on the alternative frequency coordination proposals for 4.9 GHz licensees advanced in response to our *Further Notice*. Second, we seek comment on how 4.9 GHz licensees currently use this spectrum, how we might obtain more information about such uses, what applications and uses are best suited for the band, and what are the most cost-effective ways to improve accessibility to the band while minimizing the adverse impact on incumbent operations. We seek comment on specific proposals regarding expanded eligibility and alternative licensing approaches. Next, we seek comment about the impact of the newly enacted Spectrum Act on broadband uses of the 4.9 GHz band by public safety entities. We also seek comment on adjustments to the existing channel plan for this band and other technical changes designed to promote more efficient use of the spectrum. Finally, we ask whether the need for interoperability warrants the adoption of technical standards in this band.

18. In this *Fifth Further Notice*, we also request comment on a wide range of questions that will enable us to weigh the costs and benefits associated with all rule changes we will be considering. For this reason, we request that commenters provide specific data and information, such as actual or estimated dollar figures for each specific cost or benefit addressed, including a description of how the data or information was calculated or obtained and any supporting documentation or other evidentiary support. All comments will be considered and given appropriate weight. Vague or unsupported assertions

⁴⁵ See *The 4.9 GHz Band Transferred from Federal Government Use*, WT Docket No. 00-32, *Second Report and Order and Further Notice of Proposed Rule Making*, 17 FCC Rcd 3955, 3956 ¶ 1 (2002).

⁴⁶ *Id.*

⁴⁷ *Id.*, 17 FCC Rcd at 3960-61 ¶ 7.

⁴⁸ See *Report and Order*, 24 FCC Rcd at 4303 ¶ 9.

⁴⁹ There are 2,442 licenses in the 4.9 GHz band, based on an FCC Universal Licensing System search on May 23, 2012. (Search parameters: Radio Service = PA – Public Safety 4940-4990 MHz Band; Authorization Type = Regular; Status = Active.) We estimate that fewer than 2,442 governmental entities hold these licenses because certain entities may have multiple licenses. By contrast, Census Bureau data for 2007 indicate that there were 89,476 local governmental jurisdictions in the United States, all of which are eligible to hold licenses in the 4.9 GHz band. See U.S. Census Bureau, *Statistical Abstract of the United States: 2012*, Section 8, at 267, Table 428; 47 C.F.R. §§ 90.523(a), 90.1203(a).

regarding costs or benefits generally can be expected to receive less weight and be less persuasive than more specific and supported statements.

A. Coordination

19. As noted above, our rules currently require 4.9 GHz licensees to “cooperate in the selection and use of channels in order to reduce interference and make the most effective use of the authorized facilities.”⁵⁰ In the *Further Notice*, the Commission expressed concern that this rule “may not ensure that applicants for primary permanent fixed stations offer sufficient protection to other primary permanent fixed stations and other co-primary users,”⁵¹ and that “additional measures are required to minimize the potential for interference.”⁵² Accordingly, the Commission advanced a proposal for a notification and response coordination procedure used in Part 101 of the Commission’s rules.⁵³ The Commission also invited commenters to suggest any alternative measures that would serve the purpose of the proposal.⁵⁴ The comments identified two such alternatives: the registration and database creation approach, and the regional plan approach. We seek comment below on these alternatives.

20. Although quantifying the benefits of coordination to primary users and the added costs imposed on applicants may be difficult, we believe it is important to determine whether adopting a coordination procedure will significantly benefit the public. This is due to the apparent benefits of coordination: (i) reduced risk of interference, which translates into clearer communications, which in turn may mean the difference of life or death in an emergency situation, and (ii) improved spectrum efficiency, which would allow more entities to use the 4.9 GHz band for wireless broadband communications. We therefore are seeking more information on the benefits and costs of implementing such a procedure. Specifically, are the Commission’s concerns from the *Further Notice* as recounted above sufficiently valid to warrant a more formal coordination requirement? Is Section 90.1209(b) sufficient as it is? Are there interference issues today that cannot be resolved by the requirements of this rule? How would the 4.9 GHz license environment look if the Commission does not alter 4.9 GHz coordination requirements? If commenters agree with the Commission’s concerns, are there non-regulatory alternatives to new coordination procedures?

1. Part 101 approach

21. *Background and prior comments.* In the *Further Notice*, the Commission sought comment on a proposal to modify Section 90.1209(b) to require applicants for primary fixed stations providing point-to-point and point-to-multipoint communications to complete the prior coordination procedures of Section 101.103(d) of the Commission’s rules.⁵⁵ In response, the National Spectrum

⁵⁰ 47 C.F.R. § 90.1209(b).

⁵¹ See *Further Notice*, 24 FCC Rcd at 4317 ¶ 44. The rule also notes that in the absence of cooperation in resolving instances of harmful interference, the Commission may impose restrictions, and that it may also “prohibit the use of any 4.9 GHz channel under a system license at a given geographical location when, in the judgment of the Commission, its use in that location is not in the public interest.” 47 C.F.R. § 90.1209(b).

⁵² See *Further Notice*, 24 FCC Rcd at 4317 ¶ 44.

⁵³ See *id.* at 4317 ¶ 45. See also 47 C.F.R. Part 101.

⁵⁴ See *Further Notice*, 24 FCC Rcd at 4317 ¶ 45.

⁵⁵ See *id.* at 4317 ¶ 45. See also 47 C.F.R. §§ 90.1209(b), 101.103(d). Under this approach, proposed frequency usage of fixed microwave stations must be prior coordinated with existing licensees, permittees, and applicants in the area. See *id.* The coordination involves two separate elements: notification and response. See *id.* § 101.103(d)(2)(i). The notification to licensees must include relevant technical details of the proposal. See *id.* § (continued....)

Management Association (NSMA) supported the approach as “allow[ing] a high degree of frequency reuse while avoiding harmful interference.”⁵⁶ It notes that “[m]any public safety organizations are licensees of fixed microwave spectrum under Part 101 and we believe that these users have confidence in the value of the prior coordination process for these systems.”⁵⁷ NSMA recommends that coordination should be required for all permanent fixed systems, including secondary systems, for three reasons: site-by-site licensing is required for all fixed stations;⁵⁸ secondary systems are potential interference sources;⁵⁹ and this interference is most appropriately addressed in the coordination process.⁶⁰

22. NPSTC, Harris, APCO and Motorola oppose the Part 101 coordination method. These parties emphasize that Part 101 links are highly directional and thus can be represented as narrow paths on a coordination map; in contrast, they note, the low-power, less-directional, geographically-dispersed links in a 4.9 GHz network must be represented as a service area or sector.⁶¹ NPSTC argues that Section 101.103(d) requirements regarding “permissible levels” of interference and resolution of “technical problems” are difficult to apply in the 4.9 GHz context, where there are a large variety of operations and where system overlap is often impossible to avoid.⁶² It also notes that the Section 101.103(d)(1) provision for attaching an explanation to the application in the event technical problems cannot be resolved includes no criteria to be applied to either accept or reject such an explanation.⁶³ In reply comments, Motorola agrees that “requiring public safety agencies to coordinate and reply without standards to guide the engagement will lead to protracted and burdensome negotiations.”⁶⁴ Motorola states that “it would be difficult, if not impossible, to establish technical criteria for this band given the diversity of networks and devices that can be deployed in the 4.9 GHz band.”⁶⁵ Harris similarly notes that in this context Part 101 coordination would “create confusion, be burdensome and would slow the deployment of broadband and data-sharing applications.”⁶⁶

23. NSMA submitted reply comments to address these concerns about Part 101 coordination.⁶⁷ NSMA notes that Part 101 coordination “takes place among the licensees” and does not

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101.103(d)(2)(ii). Once notification is provided, affected parties have thirty days to respond. *See id.* § 101.103(d)(2)(iv). All new applications and major technical amendments must certify that coordination, including response, has been completed. *See id.* § 101.103(d)(2)(i). The certification must specify the names of the licensees, permittees, and applicants with which coordination was accomplished. *See id.*

⁵⁶ NSMA Comments at 1.

⁵⁷ *Id.* at 1-2.

⁵⁸ *See* 47 C.F.R. § 90.1207(d).

⁵⁹ Secondary operations are “radio communications which may not cause interference to operations authorized on a primary basis and which are not protected from interference from those primary operations.” 47 C.F.R. § 90.7.

⁶⁰ *See* NSMA Comments at 2-3.

⁶¹ NPSTC Comments at 5-6; Harris Comments at 7; Motorola Reply Comments at 2.

⁶² *See* NPSTC Comments at 7-9.

⁶³ *Id.* at 8.

⁶⁴ Motorola Reply Comments at 2-3.

⁶⁵ *Id.* at 3.

⁶⁶ Harris Comments at 8.

⁶⁷ *See* NSMA Reply Comments at 1.

require the involvement of FCC-certified frequency coordinators or regional planning committees.⁶⁸ Moreover, NSMA states that “the interference criteria used are those deemed appropriate by the parties involved and may be based on good engineering practice as applicable to the band” and that Part 101 coordination “can be completed much more quickly [than 30 days] or even verbally if the parties agree.”⁶⁹ Finally, NSMA argues that when directional antennas are used to form point-to-point links, “methods of direct interference calculations [used in the Part 101 context] could be used even if the antennas are lower in gain and larger in beamwidth.”⁷⁰

24. *Discussion.* We acknowledge the views of the majority of commenters that Part 101-type coordination procedures proposed in the *Further Notice* may not be appropriate for this band because they would add a level of uncertainty and complexity to the coordination process. For example, Section 101.103(d)(1) requires applicants to select technical parameters “that will avoid interference in excess of permissible levels to other users.”⁷¹ As NPSTC noted above, “permissible levels” of interference are not defined in the 4.9 GHz rules under Part 90. Motorola also noted that requiring public safety agencies to coordinate without technical standards to guide the engagement could lead to protracted and burdensome negotiations,⁷² as incumbent licensees have no technical guidance on whether a proposed 4.9 GHz fixed link could cause interference to existing 4.9 GHz operations. We recognize that it would be difficult to establish technical criteria operations due to the diversity of networks and devices that can be deployed in the 4.9 GHz band. While we invite further comment on Part 101-type coordination procedures for the 4.9 GHz band, we consider and invite comments on other coordination procedures below.

2. Registration and database approach

25. *Comments.* NPSTC and APCO assert that the Commission should provide for a registration procedure administered by the National Regional Planning Council (NRPC) in conjunction with individual public safety 700 MHz regional planning committees (RPCs).⁷³ NPSTC states that “a NPSTC representative held informal discussions with the NRPC recently and it appears that the NRPC, in conjunction with individual RPCs, is willing to assist with such a registration process.”⁷⁴ Motorola supports this NRPC/RPC registration proposal.⁷⁵

26. *Discussion.* Given the support of the majority of commenters and several participants in the 4.9 GHz Workshop,⁷⁶ and the passage of time since the Commission adopted the majority of the 4.9

⁶⁸ *Id.* at 1.

⁶⁹ *Id.*

⁷⁰ *Id.* at 2. NSMA does concede, however, that “the traditional direct interference calculations intending to limit receiver threshold degradation to 1 dB or less might not be applicable for mesh links formed between sector or omnidirectional antennas [in the 4.9 GHz band].” *Id.*

⁷¹ 47 C.F.R. § 101.103(d)(1).

⁷² See Motorola Reply Comments at 2-3.

⁷³ See NPSTC Comments at 1; APCO Comments at 2. We assume that references to the “National Regional Planning Committee” mean the “National Regional Planning Council” (NRPC). See <http://www.nrpc.us>

⁷⁴ NPSTC Comments at 9.

⁷⁵ Motorola Reply Comments at 2.

⁷⁶ See 4.9 GHz Workshop Video; presentations and remarks by David Buchanan, Chair, Spectrum Committee, NPSTC; Joe Ross, Senior Partner, Televate, LLC; Pam Montanari, Radio & Data Systems Manager, Pinellas County, Florida.

GHz service rules in 2003 and 2004, we seek further comment on the possibility of having the NRPC and/or RPCs administer registration in the 4.9 GHz band. We note that neither the NRPC nor any RPC filed comments or reply comments to the *Further Notice*, so we invite their input in particular. Commenters should explain whether and why the NRPC and/or RPCs are the most appropriate entities to administer this process, or if other entities would be better or equally qualified. We solicit views concerning each of the following areas described below: registration, database options, and coordination.

27. *Registration.* Under the NPSTC and APCO proposal, the registration process would populate a database with *existing* licensee technical parameter data so that a coordinating entity may select appropriate frequencies for *new* applicants. Based on our experiences, databases can provide a practical tool for certified frequency coordinators to perform their channel assignments if the appropriate information is included in the database.⁷⁷ For example, the Universal Licensing System (ULS) does not contain receiver locations for point-to-point or point-to-multipoint links,⁷⁸ base station coordinates, antenna gain, output power, and antenna height for facilities licensed on a geographic basis.⁷⁹ Without this information, a coordinating entity would have great difficulty in protecting incumbent primary fixed links and base stations from interference from later-coordinated operations.

28. For this reason, we propose to require all current 4.9 GHz licensees to register the technical parameters of their permanent fixed point-to-point, point-to-multipoint and base-to-mobile stations, including permanent fixed receivers when applicable, into a database. A database registration requirement would reduce the incidence of actual interference and would ensure that primary operations receive proper interference protection. In combination with existing license information available in ULS, this data would provide any coordinating entity with a detailed survey of the operating environment in a given geographic area. We solicit input on a comprehensive list of technical parameters that the database should store for each type of operation to facilitate successful coordination. A database administrator would first populate the database with data from ULS and then update the database on a regular basis. Subsequent registrations would supplement ULS data with additional data that is not currently in ULS, but would be needed in order to coordinate new applications. We envision that a coordinating entity, acting on behalf of an applicant, would use this database to select the most appropriate frequencies for new facilities. The database would need to be updated as licenses for new facilities are granted. We envision that this database would enable any coordinating entity to use the technical information in the database to coordinate new users while protecting incumbent licensees from interference. This framework would enable licensees with primary status to register the technical parameters of their facilities with the database administrator in order to ensure that their existing operations are protected from interference from new operations. We seek comment on all aspects of this proposal, including the entity best suited to operate the database. Are there any other benefits to a registration database requirement?

⁷⁷ See, e.g., <http://www.apco911.org/spectrum-management/frequency-coordination/frequency-coordination-overview.html> (last visited May 23, 2012) (explaining that APCO maintains an extensive database).

⁷⁸ A permanent fixed point-to-point link consists of a permanent fixed transmitter and a permanent fixed receiver to transmit information one way. A permanent fixed point-to-multipoint link is similar, but with multiple receivers. Permanent fixed point-to-point and point-to-multipoint stations are licensed on a site-by-site basis. See 47 C.F.R. § 90.1207(d). This rule only applies to the permanent fixed transmitters; thus, data for fixed receivers is not stored in ULS.

⁷⁹ The current 4.9 GHz license format is geographic in nature except for permanent fixed point-to-point and point-to-multipoint stations. It gives the licensee authority to operate base stations, mobile units, and temporary fixed stations anywhere within the jurisdiction of the license. See 47 C.F.R. §§ 90.1207(a), (b), (c). Thus, data for base stations is not stored in ULS.

29. We seek comment on whether the lack of available information regarding existing 4.9 GHz fixed links is a problem that requires our attention. Specifically, we welcome views on whether the anticipated benefits of using some form of a registration database would outweigh the potential burdens imposed on licensees and applicants by the collection of the type of information with such a database. The registration requirement would also impose information collection costs on licensees and applicants. With respect to burdens, what are the time and labor costs for licensees to register their data? Are licensees concerned about privacy and security regarding putting the details of their 4.9 GHz networks into a database? In considering the database options below, we ask commenters to consider the overall costs and benefits associated with each option.

30. *Database options.* To the extent that commenters support a mandatory database registration requirement, we seek comment on the most cost effective means to achieve that goal. We tentatively conclude that the most cost-effective option is for the Commission to create and maintain a 4.9 GHz registration database that is modeled after an existing registration database. We note, for example, that the Commission created a registration database as part of ULS for use on an interim basis in the millimeter wave 70/80/90 GHz bands.⁸⁰ For purposes of populating the database for the 70/80/90 GHz bands, the Commission collected information such as coordinates of permanent fixed transmitters and receivers along with technical parameters and equipment information on FCC Form 601 Schedule M. We seek comment on the utility of this approach. Could the Commission use a similar approach to leverage its experience and staff expertise to create a new dedicated 4.9 GHz database, thus leading to lower initial development costs and ongoing operating costs? The 3650 MHz band has a similar database to 70/80/90 GHz, but it does not collect receiver information. We tentatively conclude that this model is not ideal because it is difficult to coordinate around primary permanent fixed point-to-point links if there is no receiver information.

31. We also seek comment on whether the Computer-Assisted Pre-Coordination Resource and Database (CAPRAD) would be more suitable to accommodate a database for coordinating applications seeking to use the 4.9 GHz band. CAPRAD is an established, third-party database for the 700 and 800 MHz narrowband channels that RPCs use in advance of submitting regional plans to the FCC.⁸¹ Although RPCs widely use CAPRAD, we note that the Commission has never mandated its use. We note that RPCs are unfunded entities and may not be able to afford third party database access as part of their coordination duties. Accordingly, we seek comment on CAPRAD funding and administration for both development of 4.9 GHz capability and long-term continuity and maintenance of the database.

32. Finally, we solicit views about whether other parties would be in the best position to develop and administer a 4.9 GHz database. For example, in the White Spaces proceeding, the Office of Engineering and Technology designated nine commercial entities to serve as TV band device database administrators.⁸² Among other requirements, the entities had to demonstrate technical expertise, describe

⁸⁰ See Wireless Telecommunications Bureau Announces Licensing and Interim Link Registration Process, Including Start Date for Filing Applications for Non-Exclusive Nationwide Licenses in the 71-76 GHz, 81-86 GHz, AND 92-95 GHz Bands, *Public Notice*, 19 FCC Rcd 9439 (WTB 2004). The Wireless Telecommunications Bureau eventually tasked three database managers to develop and manage databases of link registrations by FCC licensees in the millimeter wave bands. See Allocations and Service Rules for the 71-76 GHz, 81-86 GHz and 92-95 GHz Bands, WT Docket No. 02-146, *Order*, 19 FCC Rcd 20524 (WTB 2004).

⁸¹ See <http://caprad.org>.

⁸² See Unlicensed Operation in the TV Broadcast Bands, ET Docket No. 04-186, Additional Spectrum for Unlicensed Devices Below 900 MHz and in the 3 GHz Band, ET Docket No. 02-380, *Order*, 26 FCC Rcd 554 (OET 2011).

database function and architecture, and describe how devices would communicate with the database.⁸³ If commenters support a new 4.9 GHz database developed and administered by third parties, we seek comment on its funding. Should the database administrator(s) charge coordinators for access, and what fee structure is reasonable?

33. Alternatively, we seek comment on whether the database paradigm developed in the TV White Spaces (TVWS) context itself could be extended to accommodate public safety use in the 4.9 GHz band. Could the TVWS databases be extended to include public safety registration information for this band? Could existing or newly authorized TVWS database administrators administer this additional functionality? Could such a system provide a platform, over time, to enable secondary commercial use of the band with database-enabled protections to public safety operations?⁸⁴ We note that the TVWS database paradigm is vastly different from the other suggestions above because it could enable a dynamic, almost real-time environment where different entities or different transmitters or links could be used at different times based on prior knowledge of activity in the band. Is such a dynamic database advantageous for the 4.9 GHz band? If so, then what is the feasibility for equipment manufacturers to provide geolocation capability to 4.9 GHz equipment and enable almost real-time flow of geolocation and 4.9 GHz band usage information between the equipment and a database? How would the database integrate existing operations that do not have these capabilities with new operations? What is the time frame for developing and deploying equipment? Finally, what are the cost implications on equipment and for coordination?

34. *Coordination.* We seek suggestions for appropriate coordination procedures. Should we mandate that 4.9 GHz applicants seek the concurrence of their RPC as a condition to Commission action on new applications and major modifications of existing facilities? What entities could provide coordination services on a continuing basis? How would 4.9 GHz coordination compare to the coordination process handled by certified frequency coordinators in the other public safety frequency bands? We seek comment on whether alternative entities, such as the certified public safety frequency coordinators, should handle coordination functions for the 4.9 GHz band. We also seek comment on what technical criteria should be used to ensure that new 4.9 GHz facilities protect existing users from interference. Should the technical criteria be codified in our rules or should it be an industry-agreed standard?

35. *Applicability of coordination procedure.* We note that the *Further Notice* proposal for a more formal coordination procedure was limited to primary fixed operations.⁸⁵ We seek comment on whether we should require coordination for other uses, such as temporary fixed, mobile, and (as NSMA has urged) secondary permanent fixed uses. We also seek comment on whether all possible uses should be subject to a coordination requirement, or whether certain uses should be exempt and be subject only to Section 90.1209.

36. *Inactive/unformed RPCs.* We seek comment on registration requirements in regions with inactive or unformed RPCs. NPSTC states, “[o]ne concern that could arise with such a process is that a few of the 700 MHz RPC’s are not yet active.”⁸⁶ In 2008, NPSTC found that “87% of the current [4.9

⁸³ *Id.* at 555 ¶ 4.

⁸⁴ *See infra* Section III.B.

⁸⁵ *See Further Notice*, 24 FCC Rcd at 4317 ¶ 45.

⁸⁶ NPSTC Comments at 9.

GHz] licenses do fall within active RPC areas,⁸⁷ which would leave 13% of 4.9 GHz licensees without an RPC. We seek updated information on this question. In the event that individual RPCs administer registration, should registration in such areas default to the NRPC?

37. *Costs and benefits.* We seek comment on the costs and benefits associated with registration administered by the NRPC/RPCs. We ask commenters representing the NRPC or the RPCs to discuss to what extent they possess the personnel, technical, and financial resources to administer registration responsibilities for the 4.9 GHz band considering that these organizations are unfunded. Should the NRPC/RPCs be entitled to charge licensees a fee for registration? What is the likely or appropriate amount of such fees or other costs? We seek comment on whether the benefits associated with this proposal can be quantified and whether they outweigh the costs?

3. Regional plan approach, Section 90.1211

38. Section 90.1211(a) of the Commission's rules specifies that each region may (but is not required to) submit a plan on guidelines to be used for sharing spectrum in the 4.9 GHz band.⁸⁸ Paragraphs (b) and (c) of Section 90.1211 contain elements to be included in regional plans and instructions for their modification, respectively.⁸⁹ In 2004, the Commission reaffirmed its decision in the *4.9 GHz Third Report and Order* not to make regional planning mandatory in the 4.9 GHz band.⁹⁰

39. Harris notes that Section 90.1211 already specifies a process for ensuring coordination of 4.9 GHz links and proposes that it be amended so that the Regional Plans also cover permanent fixed links, as well as mobile and temporary fixed links.⁹¹ Harris asserts that having a single entity manage coordination in each region is appropriate because public safety 4.9 GHz networks can use the same infrastructure for fixed and nomadic links," and that such an approach "would better implement the Commission's intended licensing based on the geographic jurisdiction of licensees."⁹² In its view, "[t]he RPCs would be aware of operational links within a defined area on a map of a jurisdiction in which a licensee uses a specific channel and can provide 'coverage sectors' or 'frequency coverage' where a network is deployed on that frequency."⁹³ Harris does not mention the NRPC, and thus appears to endorse a regional as opposed to a national approach. Nor does it mention a registration database.

40. Under the Harris approach, we ask whether RPCs could manage coordination in each region by submitting regional plans to the Commission rather than having licensees register technical parameters in a database. How would RPCs be able to coordinate new applicants successfully around incumbent operations without a comprehensive database?

⁸⁷ *Id.*

⁸⁸ 47 C.F.R. § 90.1211(a).

⁸⁹ 47 C.F.R. §§ 90.1211(b), (c).

⁹⁰ See *The 4.9 GHz Band Transferred from Federal Government Use*, WT Docket No. 00-32, *Memorandum Opinion and Order*, 19 FCC Rcd 22325, 22331-32 ¶¶ 17-20 (2004) (*4.9 GHz MO&O*).

⁹¹ Harris Comments at 5.

⁹² *Id.* at 5-6.

⁹³ *Id.* at 6.

41. In 2004, the Commission stayed the 2004 deadline for submitting regional plans.⁹⁴ Because the stay is still in effect,⁹⁵ we seek comment on whether we should lift the stay in this proceeding and pursue Harris' recommendation. What would be the appropriate deadline for RPCs to submit plans on guidelines to be used for sharing the 4.9 GHz spectrum within the relevant region? Would twelve months after the lifting of this stay allow sufficient time? For commenters that support lifting the stay, should we modify the rule and now mandate that all active RPCs submit plans on guidelines to be used for sharing the 4.9 GHz spectrum within the relevant region? Should we require periodic updates to the plans to account for evolution in use of the band, and if so what period would be appropriate? Should we amend Section 90.1211(b) so that regional plans include descriptions of permanent fixed links, as Harris suggests, and also base stations? What other modifications to the rule would be necessary? For commenters that support a continued stay, would subsections (b) and (c), which detail minimum common elements for all plans and modification procedures, continue to serve any purpose? If not, should we delete those rules altogether, and why? Finally, are the national registration database approach and the regional plan approach mutually exclusive? If not, how could certain elements of each approach be combined to serve the public interest?

B. Expanded Eligibility and Alternate Licensing

42. We also take this opportunity to explore additional ways in which we could promote efficient and increased use of the 4.9 GHz band. One approach is to expand eligibility to include certain non-public safety entities. Three other approaches – all suggested by participants at the 4.9 GHz Workshop – are to implement usage-specific licensing, to substitute jurisdictional licensing for individual entity licensing, and to allow all permanent fixed point-to-point operations on a primary basis regardless of whether they support broadband or narrowband traffic.⁹⁶ These approaches are not necessarily mutually exclusive, so we seek comment on various combinations of these approaches in addition to responses to the more specific questions we ask below.

43. *Expanded eligibility.* Currently, only entities providing public safety services are eligible for licenses in the 4.9 GHz band.⁹⁷ Non-public safety entities may use the 4.9 GHz spectrum by entering into sharing agreements with eligible 4.9 GHz public safety licensees, but only for “operations in support of public safety.”⁹⁸ We invite parties that have entered into such agreements to file comments describing their arrangements and how they are using 4.9 GHz spectrum. We seek comment on whether the Commission should extend eligibility to use the band to non-public safety users, subject to protections to maintain the integrity of public safety operations. While we believe that all primary uses of the 4.9 GHz band should remain limited to operations in support of public safety consistent with Section 90.1203(b), we tentatively conclude that expanding eligibility for commercial use on a secondary basis would benefit and reduce regulatory burdens on non-public safety entities by removing a barrier to entry to use the 4.9

⁹⁴ See *The 4.9 GHz Band Transferred from Federal Government Use*, WT Docket No. 00-32, *Order*, 19 FCC Rcd 15270 (2004) (*Stay Order*).

⁹⁵ See 47 C.F.R. § 90.1211, “EFFECTIVE DATE NOTE: At 69 FR 51959, Sept. 23, 2004, paragraph (a) of § 90.1211 was stayed indefinitely.”

⁹⁶ See 4.9 GHz Workshop Video and more specific citations *infra*.

⁹⁷ See 47 C.F.R. §§ 90.1203(a), 90.523.

⁹⁸ See 47 C.F.R. § 90.1203(b). We note that the Commission designated the 4.9 GHz for public safety use by rule; that is, use for public safety services is not a statutory requirement for this band. See *The 4.9 GHz Band Transferred from Federal Government Use*, WT Docket No. 00-32, *Second Report and Order and Further Notice of Proposed Rule Making*, 17 FCC Rcd 3955 (2002).

GHz band. In particular, we note the spectral proximity of the 4.9 GHz band to the 5 GHz band widely used by unlicensed Wi-Fi networks.⁹⁹ We seek comment on whether expanding eligibility might improve the availability, variety, and economics of equipment that uses the band, to the benefit of public safety operations. Should the Commission open eligibility to commercial users on a secondary or other non-interfering basis subject to a shutdown feature to enable priority access by public safety entities?¹⁰⁰ Commenters in support of commercial use should provide functional details on how such a shutdown feature would operate in practice. Could such a mechanism be based upon dynamic access control using a database similar to the TV White Spaces database? We seek comment on whether critical infrastructure industry (CII) entities,¹⁰¹ including utility companies, should be eligible to hold 4.9 GHz licenses on a primary basis, thus removing the requirement for a sharing agreement.¹⁰² How would allowing CII to be licensed affect the coordination schemes discussed above? Should the Commission extend eligibility to government entities that provide non-public safety services? Of what relevance here is the Spectrum Act's expanded definition of public safety entities to include emergency response providers?¹⁰³ We seek comment on what other benefits might arise by relaxing use of the band. What are the costs for expanding eligibility, if any, including spectrum congestion?

44. *Usage-specific licensing.* Currently, all classes of operations in the 4.9 GHz band, such as base, mobile, and fixed operations, are able to co-exist on one license. Station class codes differentiate the various classes. One participant from the 4.9 GHz Workshop recommended that the Commission implement different types of licenses based on usage.¹⁰⁴ For example, under this recommendation, an eligible user would operate permanent fixed links under one license with a distinct radio service code, while the same user would conduct its mobile-only operations under a separate license with a different radio service code. Usage-specific licenses may facilitate coordination, especially if the Commission decides not to implement a registration database as part of ULS. We seek comment on the merits of usage-specific licensing. For example, interested parties would be able to see licenses for base/mobile operations, point-to-point, and mobile-only, and plan new operations around the incumbents accordingly. Would usage-specific radio service codes be duplicative of the current system of station class codes for different uses on a single license? Would usage-specific license types have a direct impact on accommodating new technology or encouraging development in the band? Would licensees view usage-specific license types as restrictive or flexible, and why? If commenters support usage-specific licensing,

⁹⁹ We note that the Commission's rules permit unlicensed operation in the band 5.15-5.35 GHz. See, e.g., 47 C.F.R. § 15.403(s). The Spectrum Act § 6406 directs the Commission to begin a proceeding to allow unlicensed National Information Infrastructure (U-NII) devices to operate in the 5350-5470 MHz band. We do not intend to influence that directive or the Commission's future related actions in any way by asking questions about 5 GHz band unlicensed operations and equipment here.

¹⁰⁰ See 4.9 GHz Workshop Video; remarks by Edmond J. Thomas, Telecommunications Policy Advisor, Wiltshire & Grannis, LLP.

¹⁰¹ See definition of "Critical Infrastructure Industry (CII)" in 47 C.F.R. § 90.7: "State, local government and non-government entities, including utilities, railroads, metropolitan transit systems, pipelines, private ambulances, volunteer fire departments, and not-for-profit organizations that offer emergency road services, providing private internal radio services provided these private internal radio services are used to protect safety of life, health, or property; and are not made commercially available to the public." *Id.*

¹⁰² See 4.9 GHz Workshop Video; presentation by Brett Kilbourne, Deputy General Counsel, Utilities Telecom Council.

¹⁰³ See Spectrum Act §§ 6001(26)-(27).

¹⁰⁴ See 4.9 GHz Workshop Video; presentation by Pam Montanari, Radio & Data Systems Manager, Pinellas County, Florida.

then we also seek comment on whether new or existing radio service codes are the better method to implement usage-specific license types. We also seek comment on the benefits and costs of implementing distinct licensing. Would licensees need to modify their licenses or possibly apply for new licenses to separate different uses that are currently authorized under one license?

45. *Jurisdictional licensing.* Another participant from the 4.9 GHz Workshop recommended that the Commission require single jurisdictional licensing, as opposed to individual licenses for each agency within a jurisdiction.¹⁰⁵ For example, a town's fire, emergency medical services, and police departments would operate under one town 4.9 GHz license, as opposed to separate licenses. We seek comment on this recommendation. Would single jurisdictional licensing help eligible users effectively utilize the spectrum and encourage different users to coordinate their operations amongst each other? Would this approach, by reducing the number of licenses, substantially simplify RPC coordination? In the event that the Commission expands primary eligibility to CII entities as described above, should CII and traditional public safety entities in the same jurisdiction, such as a power utility company and a fire department, be forced to share a 4.9 GHz license without the safeguard of priority use in favor of the public safety entities in times of emergency, or should a private agreement govern use of the license? We seek comment on the benefits and costs associated with jurisdictional licensing. What other benefits would accrue from jurisdictional licensing? What time and costs would be required for individual users within a jurisdiction to coordinate their operations amongst each other? How would the Commission enforce licensee responsibilities for arrangements involving related or unrelated entities operating in the same jurisdiction?

46. *Primary permanent fixed links.* Prior to 2009, the Commission licensed all permanent fixed stations on a secondary basis to other operations in the 4.9 GHz band.¹⁰⁶ In 2009, the Commission amended Section 90.1207(d) to permit licensing of permanent fixed point-to-point and point-to-multipoint stations that deliver broadband services on a primary basis, while those stations that deliver narrowband traffic remain secondary.¹⁰⁷ One participant from the 4.9 GHz Workshop recommended that the Commission promote use of the band by allowing all permanent fixed point-to-point operations on a primary basis, regardless of whether they support broadband or narrowband traffic.¹⁰⁸ We seek comment on this proposal. We seek comment on whether such action may result in prolonged interference disputes or increased coordination challenges. Because the recommendation applies only to permanent fixed point-to-point stations, we also seek comment on whether permanent fixed point-to-multipoint stations that do not deliver broadband service would remain secondary.

C. Complement to 700 MHz Broadband Networks

47. As noted above, in the *Fourth FNPRM*, we recognized the need for broadband available for fixed uses in connection with the public safety broadband network, and invited comment on how the 4.9 GHz band could be used to complement the 700 MHz public safety broadband spectrum, which is allocated to mobile use. MSI and Harris filed comments relevant to this topic. As part of the Spectrum Act, Congress has now mandated the creation of FirstNet, which will be responsible for constructing and

¹⁰⁵ See 4.9 GHz Workshop Video; remarks by Stephen Devine, Interoperability Program Manager, Missouri Department of Public Safety.

¹⁰⁶ See 47 C.F.R. § 90.1207(d) (2008).

¹⁰⁷ See *Report and Order*, 24 FCC Rcd at 4303 ¶ 9; 47 C.F.R. § 90.1207(d).

¹⁰⁸ See 4.9 GHz Workshop Video; presentation by Brett Kilbourne, Deputy General Counsel, Utilities Telecom Council.

deploying a nationwide interoperable public safety broadband network. It has also authorized the Commission to “take any action necessary to assist [FirstNet] in effectuating its duties and responsibilities” under that Act.¹⁰⁹ We seek comment on the use of the 4.9 GHz band for fixed, backhaul, and mobile uses in support of the 700 MHz band public safety broadband network, and whether such uses are appropriate or desirable. In general, we seek comment on what changes to the 4.9 GHz rules are necessary to better enable the 4.9 GHz band to complement the 700 MHz public safety broadband network. Finally, we seek comment on FirstNet’s eligibility to hold licenses in the 4.9 GHz band.

48. *Fixed uses.* In response to the *Fourth FNPRM*, MSI suggests that “[t]he 4.9 GHz band could be used to supplement the 700 MHz public safety mobile broadband spectrum particularly for offloading video.”¹¹⁰ Since the 4.9 GHz band has a fixed service allocation,¹¹¹ we believe the 4.9 GHz band is ideal for video fixed uses, such as point-to-point video surveillance links.¹¹² We seek further comment on whether and how fixed links in the 4.9 GHz band could complement the 700 MHz broadband public safety network. What other dual-band applications do commenters envision? How can fixed links be used during day-to-day operations as well as during emergencies or disasters? Are there applications, system configurations, or geographic morphologies that are best suited for fixed use in the 4.9 GHz band? What changes to the 4.9 GHz rules, if any, are necessary to enable fixed links in the 4.9 GHz band to complement the 700 MHz public safety broadband network? We ask commenters supporting rule changes to discuss how such rule changes would serve the public interest. We also request comment on the relative costs and benefits of using 4.9 GHz technology to complement the 700 MHz public safety broadband network as compared to other technologies, such as point-to-point microwave interconnection in other bands and fiber optic interconnection.

49. *Backhaul and coordination/licensing.* We seek comment on how the 4.9 GHz band can assist public safety communications with their backhaul needs? Harris states, “[t]he 4.9 GHz band could be a vital resource to public safety in providing 700 MHz backhaul services.”¹¹³ Harris suggests, “[r]ules that allow 4.9 GHz networks to complement [sic] 700 MHz networks will maximize the capabilities and capacity of both bands.”¹¹⁴ We seek comment on what specific rules could allow 4.9 GHz networks to complement 700 MHz networks? Next, MSI suggests that the Commission could “mandate the use of 4.9 GHz for public safety backhaul instead of 6-38 GHz.”¹¹⁵ We seek comment on this proposal; however, we are concerned about restricting flexibility and choice. If the 4.9 GHz band is used for both backhaul and fixed broadband to complement 700 MHz, how will coordination be affected? Would 4.9 GHz fixed links and backhaul links have similar technical parameters in terms such as antenna gain, power, and path? If so, would the two types of traffic be treated the same from a coordination standpoint? Should 4.9 GHz components that interconnect with the 700 MHz public safety broadband network be treated different than other 4.9 GHz components from a coordination standpoint? Related to our licensing questions above, we seek comment on whether a new type of license should be issued for 4.9 GHz operations that interconnect with the 700 MHz public safety broadband network. What changes to the 4.9 GHz coordination and licensing rules, if any, are necessary to enable backhaul use in the 4.9 GHz band to

¹⁰⁹ Spectrum Act § 6213.

¹¹⁰ MSI Comments at Appendix A 35.

¹¹¹ See 47 C.F.R. § 2.106.

¹¹² See *Report and Order*, 24 FCC Rcd at 4303 ¶ 9.

¹¹³ Harris Comments to the *Fourth FNPRM* at 30.

¹¹⁴ *Id.*

¹¹⁵ MSI Comments at Appendix A 35.

complement the 700 MHz public safety broadband network, and how would these changes serve the public interest?

50. *FirstNet eligibility.* We seek comment on whether FirstNet – the statutorily designated licensee of the national public safety broadband network operating in the 700 MHz band – is or should be eligible for a 4.9 GHz band license. The Spectrum Act requires FirstNet’s network to include a core network that, *inter alia*, provides “connectivity between . . . the radio access network; and . . . the public Internet or the public switched network, or both.”¹¹⁶ This function is commonly referred to as “backhaul.” As we discussed above, the 4.9 GHz band could support backhaul links for the Public Safety Broadband Network.

51. As noted above, our rules currently limit eligibility for licensing in the 4.9 GHz band to “[e]ntities providing public safety services as defined under section 90.523.”¹¹⁷ Section 90.523 in turn incorporates the definition of public safety services used in Section 337(f)(1) of the Communications Act, which refers for purposes of allocations in the 700 MHz band to services

(A) the sole or principal purpose of which is to protect the safety of life, health, or property;

(B) that are provided—

(i) by State or local government entities; or

(ii) by nongovernmental organizations that are authorized by a governmental entity whose primary mission is the provision of such services; and

(C) that are not made commercially available to the public by the provider.¹¹⁸

FirstNet is an “an independent authority within the NTIA,”¹¹⁹ a Federal entity. It is not a state or local government entity, nor is it a nongovernmental organization that is authorized by a governmental entity whose primary mission is the provision of public safety services. FirstNet thus does not appear to qualify for 4.9 GHz licenses under the current definition. On the other hand, our rules do permit 4.9 GHz licensees to enter into sharing agreements with or other arrangements with entities that do not meet these eligibility requirements.¹²⁰ Is the rule permitting these sharing agreements sufficient to allow FirstNet to take advantage of the opportunities the 4.9 GHz band has to offer? Or, should we amend our rules to establish FirstNet’s eligibility? If so, should its eligibility be restricted to applications in support of the national public safety broadband network, such as backhaul? Of what relevance to these questions is the relationship of FirstNet under the Spectrum Act to State government entities that participate in the

¹¹⁶ See Spectrum Act § 6202(b)(2)(A).

¹¹⁷ 47 C.F.R. § 90.1203(a).

¹¹⁸ 47 U.S.C. § 337(f)(1).

¹¹⁹ Spectrum Act § 6204(a).

¹²⁰ 47 C.F.R. § 90.1203(b).

deployment of FirstNet or in the statutory “opt out” process, or to secondary users of the 700 MHz public safety broadband network providing non-public safety services?¹²¹

D. Channel Plan Adjustments

52. In 2003, the Commission adopted a frequency utilization plan that it determined “will be beneficial from an operational perspective, and will not unduly restrict the flexibility of 4.9 GHz band licensees and users.”¹²² The Commission created a plan that “consist[s] of ten one-megahertz channels and eight five-megahertz channels that can be combined to a maximum of twenty megahertz, which provides users with maximum flexibility to employ existing technologies, while leaving the door open for the implementation of future broadband technologies in the band.”¹²³ We seek comment on how well the channel plan has served the Commission’s goals. Moreover, we encourage interested parties to comment on the relative costs and benefits of the following specific approaches to modifying that plan, and how they might promote more efficient use of the band.

53. *Channel aggregations.* We seek comment on whether more flexible channel aggregations are necessary to accommodate new technology.¹²⁴ We note that Section 90.1213 already affords some bandwidth flexibility by permitting aggregated channel bandwidths of 5, 10, 15, or 20 MHz.¹²⁵ What other aggregations should the Commission allow? Do licensees have throughput requirements that necessitate channel aggregations greater than 20 MHz? We also seek comment on the individual channels. Do users find inefficiencies with the channel bandwidths for certain applications? Should the Commission revise the channel plan to specify different channel bandwidths other than 1 and 5 MHz? Interested parties should propose specific band plan alternatives along with appropriate justification. What are the costs associated with channel plan adjustment? What would manufacturers spend to design and produce equipment that could conform to a channel plan adjustment?

54. *Narrow channels.* Next, we address the ten 1-MHz bandwidth channels at the edges of the 4.9 GHz band. These narrow channels can support low-bandwidth applications, such as slow scan video surveillance and backhaul of narrowband voice traffic. Accordingly, we seek comment on a proposal to designate some or all of the 1-MHz bandwidth channels for non-broadband (*i.e.*, narrowband) use on a primary basis, and we ask whether such designation would promote use of the 4.9 GHz band.¹²⁶ Would such designation be detrimental to broadband applications? What would be the costs associated with such designation? Are ten 1-MHz bandwidth channels sufficient, and if not, what quantity should the band plan provide? On the other hand, should the Commission reduce the number of 1-MHz bandwidth channels to provide more spectrum for broadband applications, notwithstanding that current rules allow users to aggregate the 1-MHz channels to form larger bandwidths? What effect would such a reduction have on potential interference into adjacent bands, particularly radio astronomy operations?

¹²¹ See *id.* §§ 6208(a), 6302(e). As noted above, the Spectrum Act employs a definition of “public safety services” that includes services provided by emergency response providers as well as public safety services as defined in the Communications Act of 1934, as amended. See *id.* §§ 6001 (26)-(27).

¹²² *4.9 GHz Third Report and Order*, 18 FCC Rcd at 9167 ¶ 38.

¹²³ *Id.* at 9168 ¶ 39.

¹²⁴ See 4.9 GHz Workshop Video; presentation by Pam Montanari, Radio & Data Systems Manager, Pinellas County, Florida (suggesting that the FCC should provide bandwidth flexibility to accommodate new technology).

¹²⁵ 47 C.F.R. § 90.1213.

¹²⁶ See 4.9 GHz Workshop Video; remarks by Stephen Devine, Interoperability Program Manager, Missouri Department of Public Safety.

55. *Usage-specific channels.* Finally, we seek comment on designating certain channels in the band for specific uses, such as fixed point-to-point or mobile operations. MSI argues that mixed use of fixed and mobile services could introduce unacceptable interference,¹²⁷ and that dedicating a fixed portion of the band to point-to-point use and providing a reasonable coordination mechanism would help enable the use of 4.9 GHz spectrum for broadband backhaul.¹²⁸ We invite interested parties to propose specific band plans that balance different uses, along with appropriate justification. Should applicants be required to demonstrate that other microwave bands or terrestrial interconnection facilities are not available for their proposed use as a condition for receiving a point-to-point backhaul authorization in the 4.9 GHz band? Should the use of the 4.9 GHz band for point-to-point backhaul links be limited to paths in excess of a given length, *e.g.*, greater than 16 km? Alternatively, rather than designating certain channels in the band for specific uses by rule, should we leave such decisions up to the designated regional authority or coordinator for a given area based on the specific needs of that area? This would result in different channel uses in different areas, but it could provide maximum flexibility for spectrum users. If commenters support this scenario, how would users and coordinators manage potential interference at regional boundaries?

E. Other Issues

56. In this section, we consider the merits of power limit changes, antenna gain, polarization restrictions, aeronautical mobile use, standards changes, emission masks, and the implementation of deployment reporting requirements.

1. Power and polarization restrictions

57. *Comments.* As noted above, some commenters to the *Further Notice* observed that 4.9 GHz fixed links have a relatively wide beam that is less directional than a typical microwave link.¹²⁹ Wide beamwidths for point-to-point links translate to inefficient use of the 4.9 GHz band because they cover a larger sector when only a narrow path is needed to reach a single receiver. Links with narrower beams could be coordinated closer together without risk of interference, resulting in more efficient use of spectrum. Harris argues that “4.9 GHz fixed links can not be deployed with antenna above 26dB gain, and thus will not have a smaller beamwidth than ~ 8-10 degrees.”¹³⁰ By contrast, commenters note that microwave links have a minimum antenna gain that is higher than the maximum antenna gain for 4.9 GHz fixed links, and thus the beamwidth is only a few degrees, resulting in narrow, highly directional paths.¹³¹ In response to the *Fourth FNPRM*, NPSTC suggest that “one way [to make use of the 4.9 GHz band more efficient] is to specify a maximum ERP [effective radiated power] and a larger antenna gain thus reducing

¹²⁷ MSI Comments at Appendix A 35.

¹²⁸ *Id.*

¹²⁹ *See supra* para. 22.

¹³⁰ Harris Comments at 7.

¹³¹ *See* NPSTC Comments at 5; Harris Comments at 7. Harris notes that “The Part 101 technical rules for fixed microwave links require that these microwave links be deployed with a minimum antenna gain (typically 38 dB) and a maximum beamwidth of a few degrees.” Harris Comments at 7 citing 47 C.F.R. § 101.115.

beam width.”¹³² The 4.9 GHz rules do not contain ERP limits but, rather, maximum conducted output power and peak power spectral density limits.¹³³

58. *ERP and antenna gain.* We seek recommendations for an ERP limit for high power, permanent and temporary fixed transmitters. NPSTC also suggests exploring use of better coordination and larger antennas to make more efficient use of the 4.9 GHz band for broadband backhaul.¹³⁴ Accordingly, we seek comment on whether we should specify a minimum antenna gain for high power, permanent and temporary fixed operations, thereby to minimize beamwidth and the potential for interference. Section 90.1215 provides a maximum directional antenna gain for point-to-point and point-to-multipoint operations of up to 26 dBi with no corresponding reduction in maximum conducted output power or spectral density output power.¹³⁵ If antennas with a gain of more than 26 dBi are used, ERP must be reduced proportionately.¹³⁶ The Commission imposed the 26 dBi antenna gain limit “in order to avoid interference from fixed operations to mobile operations.”¹³⁷ To make point-to-point use in the band more efficient, we seek comment on whether the Commission should establish a minimum gain for point-to-point transmitting antennas and, if so, what value of gain is appropriate and what power reduction, if any, should be required. We also seek comment on whether we should impose a maximum ERP limitation on point-to-point links. We do not propose specific rule modifications at this time without a more substantial record. Interested commenters should provide technical analyses to support their recommendations on peak power and peak spectral density and/or antenna gain, bearing in mind the restriction imposed by Section 90.205 of the Commission’s rules: “applicants for licenses must request and use no more power than the actual power necessary for satisfactory operation.”¹³⁸ Should the Commission impose side lobe radiation limits on antennas used in point-to-point links?¹³⁹ Commenters should note that any increase in the power limits for the 4.9 GHz band would also have to be reflected in our agreements with Mexico and Canada for this band.¹⁴⁰ What are the costs associated with requiring larger, narrower beamwidth, antennas? Is there a practical limit to the size of antenna that may be employed? Is the gain in spectrum efficiency commensurate with the cost of larger antennas?

59. In addition, we seek comment on requiring point-to-point links to use a specific polarization, *e.g.*, horizontal or vertical, to reduce potential interference to other links or to portable or mobile devices. Applicants are required to specify the type of polarization proposed when they file 4.9 GHz applications. Should the Commission specify the polarization to be used in devices other than point-

¹³² NPSTC Comments to the *Fourth FNPRM* at 23.

¹³³ High power devices are limited in maximum conducted output power depending on the channel bandwidth. See 47 C.F.R. § 90.1215(a)(1). High power devices are limited to a peak power spectral density of 21 dBm per one MHz. See 47 C.F.R. § 90.1215(a)(2).

¹³⁴ NPSTC Comments to the *Fourth FNPRM* at 23.

¹³⁵ See 47 C.F.R. § 90.1215(a)(2).

¹³⁶ *Id.*

¹³⁷ *4.9 GHz Third Report and Order*, 18 FCC Rcd at 9175 ¶ 57.

¹³⁸ 47 C.F.R. § 90.205.

¹³⁹ Cf. 47 C.F.R. § 101.115 (Table).

¹⁴⁰ See 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 Use of the 4940-4990 MHz Band for Terrestrial Non-Broadcasting Radiocommunication Services Along the Common Border (Dec 2009) (Mexico 4.9 GHz Protocol) at Appendix I ¶ 1. At the present time, the US has no agreement with Canada for the 4.9 GHz band.

to-point links? What are the costs to retrofit or replace an antenna to change its polarization? Would polarization diversity increase the number of links that could be placed in a given area, thus increasing throughput? What benefits would this higher throughput provide? Are there other polarizations, *e.g.*, angular, elliptical or circular, that would increase the number of links that could be placed in a given area or reduce potential interference?

2. Aeronautical mobile use

60. *Background.* Sections 2.106 and 90.1205(c) prohibit aeronautical mobile operations in the 4940-4990 MHz band.¹⁴¹ In 2003, the Commission concluded that it could not fashion a general rule to permit aeronautical mobile operation that would adequately protect radio astronomy from interference in all scenarios.¹⁴² However, the Commission concurrently established a policy to consider requests for aeronautical mobile operations on a case-by-case basis under the waiver process based upon a sufficient technical showing that the proposed operations would not interfere with in-band and adjacent band radio astronomy operations.¹⁴³ The Commission has granted roughly a dozen waivers of Section 90.1205(c).¹⁴⁴

61. *Discussion.* Given the interest in aeronautical mobile use of the band,¹⁴⁵ we seek comment about whether to lift the general prohibition and allow licensees to bypass the waiver process, while maintaining an appropriate level of application review. We propose to revise Section 90.1205(c) so that the rule permits aeronautical mobile operation in the band on a secondary, non-interference basis to 4.9 GHz terrestrial services and subject to certain conditions and requirements. The revised rule would require an applicant to provide a description of proposed operation to demonstrate that aeronautical mobile operations protect radio astronomy operations and 4.9 GHz terrestrial services from interference as a part of its application. The revised rule would also require that the applicant certify to the Commission that it has served a copy of the application to all listed radio astronomy observatories whose boundaries¹⁴⁶ fall within a threshold distance from the edge of the aeronautical operation. We seek comment on whether these measures are sufficient to protect radio astronomy, or whether 4.9 GHz aeronautical mobile operation should be secondary to radio astronomy operations by rule. We seek comment on whether aeronautical mobile operation in the 4940-4990 MHz band poses an interference risk to fixed and mobile terrestrial services in the lower adjacent band 4800-4940 MHz and radio astronomy service in the band 4990-5000 MHz,¹⁴⁷ and if so, we seek comment on whether a new rule is

¹⁴¹ 47 C.F.R. §§ 2.106, 90.1205(c).

¹⁴² *4.9 GHz Third Report and Order*, 18 FCC Rcd at 9156 ¶ 11.

¹⁴³ *4.9 GHz Third Report and Order*, 18 FCC Rcd at 9156-7 ¶¶ 10-13.

¹⁴⁴ *See, e.g.*, City of Long Beach, California, File No. 0003099118; call sign WQJE424. The grant is conditioned as follows: “Waiver of rule 90.1205(c) is granted on August 8, 2008 to permit airborne use provided that operation is limited to the following technical characteristics: maximum altitude of 1500 feet above ground, transmitter may only be operated between 4940 – 4990 MHz using emission 10M0D7W, transmitter power is restricted to a maximum of 0.916 watts (13 dBW EIRP), and operation is restricted to within 15 miles of coordinates 33-47-58.1 N 118-09-47.2W. Antenna is required to track the central coordinates in both azimuth and elevation and transmitter must cease operation if GPS lock is broken. Airborne operations must protect radio astronomy and other terrestrial services from interference.” *Id.*

¹⁴⁵ *See, e.g.*, 4.9 GHz Workshop Video; presentation by Lt. Mark Wilkins, Los Angeles County Sheriff’s Department.

¹⁴⁶ The Commission’s Table of Frequency Allocations defines the boundaries of radio astronomy observatories. *See* 47 C.F.R. § 2.106 note US311.

¹⁴⁷ *See* 47 C.F.R. § 2.106.

necessary to address this issue. We also propose to revise the allocation of the 4940-4990 MHz band in Section 2.106, the Table of Frequency Allocations, to provide for aeronautical mobile service in addition to fixed and mobile services.

62. We therefore seek comment on what threshold distance for aeronautical mobile operations should apply, and whether a uniform distance is appropriate given the geographic diversity of the nation. The revised rule would note that the Commission will coordinate all such applications with the National Telecommunications and Information Administration. We seek comment on whether the rule should impose a maximum altitude of 1500 feet above ground, consistent with many of the waivers. We also seek comment on allowing only low power devices as defined by Section 90.1215 for aeronautical mobile use.¹⁴⁸ Moreover, we seek comment on whether the Commission should, on a case-by-case basis, impose special conditions and operating restrictions on individual licenses as necessary to reduce risk of interference to radio astronomy operations and 4.9 GHz terrestrial services. In addition, we propose to require that applicants submit their applications to their respective RPC or the NRPC for coordination. We seek comment on whether and how applications for airborne use should be coordinated differently from terrestrial uses. Applicants would also have to demonstrate that their aeronautical operations comply with our international agreements. For instance, 4.9 GHz transmitters may be operated in aircraft along the Mexico border provided certain signal strength limits at and beyond the border are satisfied.¹⁴⁹

63. While allowing aeronautical mobile use would be a permissive rule change rather than a restrictive one, we seek comment on the opportunity costs and benefits for licensees that seek to deploy aeronautical mobile operations. What are the costs and time requirements to provide a description of the proposed operation, to determine the distance to radio astronomy observatories, and to serve a copy of the application to affected observatories? What is the cost for GPS lock or similar equipment designed to cease transmissions in the 4.9 GHz band if the aerial vehicle exceeds the maximum altitude or a certain maximum distance from the center point coordinates? How can aeronautical mobile use of the 4.9 GHz band benefit public safety?¹⁵⁰

3. Standards

64. In 2003 and again in 2004, the Commission declined to adopt technical standards that would provide interoperability in the 4.9 GHz band because: (1) the variety of services supported by the band did not readily lend themselves to standardization or interoperability, and (2) standards likely would have cemented the 4.9 GHz band in 2004 technology such that public safety would have been denied the benefits of emerging broadband technologies.¹⁵¹ We seek comment on whether these concerns are still valid today, and whether public safety's need for interoperability outweighs these concerns. We note that the Commission adopted the Long Term Evolution (LTE) standard as the common air interface for the

¹⁴⁸ See 47 C.F.R. § 90.1215.

¹⁴⁹ Mexico 4.9 GHz Protocol at Appendix I ¶ 3.

¹⁵⁰ We note that on March 19, 2010, NPSTC filed a Petition for Rulemaking requesting that the Commission designate certain narrowband channels in the 700 MHz band for public safety air-ground voice communications. On June 30, 2011, the Public Safety and Homeland Security Bureau sought comment. See Public Safety and Homeland Security Bureau Seeks Comment on National Public Safety Telecommunications Council's Petition for Rulemaking to Allow Aircraft Voice Operations on Secondary Trunking Channels in the 700 MHz Band, RM-11433, *Public Notice*, 26 FCC Rcd 9405 (PSHSB 2011).

¹⁵¹ See *4.9 GHz Third Report and Order*, 18 FCC Rcd at 9172 ¶ 48; *4.9 GHz MO&O*, 19 FCC Rcd at 22331 ¶ 16.

700 MHz public safety broadband network to ensure nationwide interoperability.¹⁵² In that instance, the Commission “depart[ed] from the Commission’s traditional posture of technological neutrality” because “establishing a common air interface for 700 MHz public safety networks is necessary to achieve our critical goal of a nationwide interoperable public safety wireless broadband network.”¹⁵³ We share the goal of interoperability for the 4.9 GHz band. Does achieving this goal for the 4.9 GHz band require us to determine a standard for deployment in this band, or is a more flexible approach possible? According to a suggestion from the 4.9 GHz workshop, “developing open standards for equipment and infrastructure will allow interoperability and prohibit proprietary system deployments.”¹⁵⁴

65. How should the FCC ensure that a competitive marketplace for equipment develops in the 4.9 GHz band? What safeguards can the FCC put in place and how should they be applied to equipment that has already been deployed in the band? Next, because the 4.9 GHz band supports a variety of services, would it make sense to set multiple standards depending on the type of use rather than a single standard for all uses? Are most users of low power devices (output power under 20 dBm) gravitating toward a standard, such as IEEE 802.11, without a Commission mandate? Are users gravitating toward another standard for high power devices (output power higher than 20 dBm)? At present, is it possible to interconnect two or more 4.9 GHz networks for the purpose of responding to a multi-jurisdictional emergency? If not, how would standards make this possible? We seek comment on the costs and benefits for imposing equipment standards. What are the costs for equipment manufacturers to conform their designs to new standards, including costs associated with testing and FCC equipment certification? How would standards affect equipment costs for licensees over time? Because Wi-Fi equipment employs the IEEE 802.11 standard, how could economies of scale reduce equipment costs? Would standards benefit the public safety community by promoting interoperability?

66. What is the potential to adapt or redevelop equipment that is certified in nearby or adjacent frequency bands for use in the 4.9 GHz band? We note that in the band 4800-4940 MHz, the Table of Frequency Allocations lists fixed and mobile allocations for Federal users, similar to the allocations for 4.9 GHz for non-Federal users.¹⁵⁵ Is any equipment from the 4800-4940 MHz band adaptable for the 4940-4990 MHz band? On the other hand, is it possible to adapt equipment certified for the 4.9 GHz band for other nearby bands? In either case, what are the steps and costs for such adaptations? We ask these questions to determine whether manufacturers may achieve economies of scale by developing multi-band equipment and thus pass on savings to end users.

67. *Emission masks.* In 2004, the Commission loosened emission masks on devices in the 4.9 GHz band so that low power devices are subject to the DSRC-A mask – identical to the IEEE 802.11a mask; and that high power devices are subject to the more restrictive DSRC-C mask.¹⁵⁶ We seek comment on how well these emission masks are enabling public safety to leverage commercial-off-the-

¹⁵² *Third Report and Order*, 26 FCC Rcd at 736-7 ¶ 8.

¹⁵³ *Id.* at 737 ¶ 10.

¹⁵⁴ See 4.9 GHz Workshop Video; presentation by Pam Montanari, Radio & Data Systems Manager, Pinellas County, Florida. The Commission observed that “[o]pen standards enable vendors to build to common parameters.” See *Third Report and Order*, 26 FCC Rcd at 742 ¶ 27.

¹⁵⁵ See 47 C.F.R. § 2.106. There is a carve-out for radio astronomy at 4825-4835 MHz. See *id.* at footnotes US203, US342.

¹⁵⁶ See *4.9 GHz MO&O*, 19 FCC Rcd 22329-30 ¶¶ 12-13.

shelf (COTS) technologies in adjacent bands, such as the 5.4 GHz U-NII band and the ITS band.¹⁵⁷ We seek comment on what other masks we should consider that would better enable 4.9 GHz users to leverage COTS equipment while reducing adjacent channel interference.

4. Deployment reports

68. Consistent with our interest above regarding how licensees use the band and the importance of spectrum efficiency,¹⁵⁸ we anticipate that it will be useful for the Commission to receive periodic updates from 4.9 GHz licensees on what spectrum uses and applications they are deploying, and the progress of those deployments. Progress reports will provide the Commission with more information about the kinds of operations licensees deploy and will enable it to make more informed decisions regarding the development of the 4.9 GHz band rules in the future. The deployment report would include information such as status of equipment development and purchase, including number of devices and users; site development, including use of existing towers; deployments and upgrades (commencement and completion), including site information and location; and applications in development or in use.¹⁵⁹ We thus seek comment on whether to impose on 4.9 GHz licensees a periodic reporting requirement. What other specific information should the Commission collect in the report? Would it be appropriate to require such reporting on a quarterly basis for the first year following the license grant and on an annual basis thereafter? Should we subject such a requirement to a sunset provision? Should we also require reporting on planning and funding? Because a deployment report would describe how a particular licensee is using the 4.9 GHz band, would a deployment reporting requirement be unnecessary with respect to usage-specific licenses?¹⁶⁰ Does one obviate the other? We seek comment on the compliance burdens associated with proposed information collection, including the costs and time required for completion. Would a reporting requirement be beneficial to any party other than the Commission, and if so, how?

IV. PROCEDURAL MATTERS

A. Ex Parte Presentations

69. This matter shall be treated as a “permit-but-disclose” proceeding in accordance with the Commission’s *ex parte* rules.¹⁶¹ 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

¹⁵⁷ See 4.9 GHz Workshop Video; presentation by Stephen Devine, Interoperability Program Manager, Missouri Department of Public Safety.

¹⁵⁸ See *supra* para. 17.

¹⁵⁹ See Requests for Waiver of Various Petitioners to Allow the Establishment of 700 MHz Interoperable Public Safety Wireless Broadband Networks, PS Docket 06-229, *Order*, 25 FCC Rcd 5145, 5166 ¶ 64 (2010).

¹⁶⁰ See *supra* para. 44.

¹⁶¹ 47 C.F.R. §§ 1.1200 *et seq.*

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 this proceeding should familiarize themselves with the Commission's *ex parte* rules.

B. Comment Filing Procedures

70. Pursuant to sections 1.415 and 1.419 of the 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. Interested parties may file comments using: (1) the Commission's Electronic Comment Filing System (ECFS), (2) the Federal Government's eRulemaking Portal, or (3) by filing paper copies. *See Electronic Filing of Documents in Rulemaking Proceedings*, 63 FR 24121 (1998). **Commenters should refer to WP Docket No. 07-100, PS Docket No. 06-229, and WT Docket No. 06-150 when filing in response to this Fifth Further Notice of Proposed Rulemaking.**

- Electronic Filers: Interested parties may file comments electronically using the Internet by accessing the ECFS: <http://fjallfoss.fcc.gov/ecfs2/> or the Federal eRulemaking Portal: <http://www.regulations.gov>.
- Paper Filers: Parties who choose to file by paper must file an original and four copies of each filing. If more than one docket or rulemaking number appears in the caption of this proceeding, filers must submit two additional copies for each additional docket or rulemaking number.

Filings can be sent by hand or messenger delivery, by commercial overnight courier, or by first-class or overnight U.S. Postal Service mail. All filings must be addressed to the Commission's Secretary, Office of the Secretary, Federal Communications Commission.

- Effective December 28, 2009, filers submitting hand-delivered or messenger-delivered paper filings for the Commission's Secretary must deliver the filings to FCC Headquarters at 445 12th St., SW, Room TW-A325, Washington, DC 20554. Filers must make sure that all hand deliveries are held together with rubber bands or fasteners. Filers must dispose of any envelopes before entering the building. The filing hours at this location are 8:00 a.m. to 7:00 p.m. **PLEASE NOTE:** The Commission's former filing location at 236 Massachusetts Avenue, NE is permanently closed.
- Commercial overnight mail (other than U.S. Postal Service Express Mail and Priority Mail) must be sent to 9300 East Hampton Drive, Capitol Heights, MD 20743.
- U.S. Postal Service first-class, Express, and Priority mail must be addressed to 445 12th Street, SW, Washington DC 20554.

71. Interested parties may view documents filed in this proceeding on the Commission's Electronic Comment Filing System (ECFS) using the following steps: (1) Access ECFS at <http://www.fcc.gov/cgb/ecfs>. (2) In the introductory screen, click on "Search for Filed Comments." (3) In the "Proceeding" box, enter the numerals in the docket number. (4) Click on the box marked "Retrieve Document List." A link to each document is provided in the document list. The public may inspect and

copy filings and comments during regular business hours at the FCC Reference Information Center, 445 12th Street, SW, Room CY-A257, Washington, DC 20554. The public may also purchase filings and comments from the Commission's duplicating contractor, Best Copy and Printing, Inc., Portals II, 445 12th Street, SW, Room CY-B402, Washington, DC 20554, telephone 1-800-378-3160, or via e-mail to fcc@bcpiweb.com. The public may also download this Fourth Report and Order and Fifth Further Notice of Proposed Rulemaking from the Commission's web site at <http://www.fcc.gov/>.

C. Accessible Formats

72. 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).

D. Regulatory Flexibility Analysis

73. As required by the Regulatory Flexibility Act of 1980, *see* 5 U.S.C. § 603, the Commission has prepared a Final Regulatory Flexibility Analysis (FRFA) and Initial Regulatory Flexibility Analysis (IRFA) of the possible significant economic impact on small entities of the policies and rules addressed in this document. The FRFA is set forth in Appendix C and the IRFA is set forth in Appendix E. Written public comments are requested on the IRFA. These comments must be filed in accordance with the same filing deadlines as comments filed in response to this Fifth Further Notice of Proposed Rulemaking as set forth herein, and they 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 the Fifth Further Notice of Proposed Rulemaking, including this IRFA, to the Chief Counsel for Advocacy of the Small Business Administration (SBA).¹⁶²

E. Paperwork Reduction Act Analysis

74. This Fourth Report and Order does not contain new or modified information collection requirements subject to the Paperwork Reduction Act of 1995 (PRA), Public Law 104-13. In addition, therefore, the Fourth Report and Order does not contain any new or modified information collection burden for small business concerns with fewer than 25 employees, pursuant to the Small Business Paperwork Relief Act of 2002, Public Law 107-198, *see* 44 U.S.C. § 3506(c)(4).

75. This Fifth Further Notice of Proposed Rulemaking contains proposed new 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 comment on the information collection requirements contained in this document, as required by the PRA. Public and agency comments are due 60 days after publication of this document in the Federal Register. 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." The Commission will submit the Fifth Further Notice of Proposed Rulemaking to the Office of Management and Budget for review under Section 3507(d) of the PRA.

¹⁶² *See* 5 U.S.C. § 603(a).

F. Congressional Review Act

76. The Commission will send a copy of the Fourth Report and Order to Congress and the Government Accountability Office pursuant to the Congressional Review Act (“CRA”), *see* 5 U.S.C. § 801(a)(1)(A).

77. For further information, contact Mr. Thomas Eng, Policy Division, Public Safety and Homeland Security Bureau, (202) 418-0019 or TTY (202) 418-7233; or via e-mail at Thomas.Eng@fcc.gov.

V. ORDERING CLAUSES

78. Accordingly, WE ORDER, pursuant to sections 1, 4(i), 301, 302, 303, 316, and 403 of the Communications Act of 1934, 47 U.S.C. §§ 151, 154(i), 301, 302, 303, 316, and 403, that this Fourth Report and Order and Fifth Further Notice of Proposed Rulemaking is HEREBY ADOPTED.

79. WE FURTHER ORDER and AMEND Part 90 of the Commission’s Rules as specified in Appendix B, effective thirty days after publication of the Fourth Report and Order and Fifth Further Notice of Proposed Rulemaking in the Federal Register.

80. WE FURTHER ORDER that the Commission’s Consumer and Governmental Affairs Bureau, Reference Center, SHALL SEND a copy of this Fourth Report and Order and Fifth Further Notice of Proposed Rulemaking, including the Final and Initial Regulatory Flexibility Analyses, to the Chief Counsel for Advocacy of the Small Business Administration.

FEDERAL COMMUNICATIONS COMMISSION

Marlene H. Dortch
Secretary

APPENDIX AList of Commenters to the *Further Notice*

Association of Public-Safety Communications Officials-International, Inc. (APCO)
Cable and Telecommunications Committee of the New Orleans City Council (New Orleans)
Harris Corporation (Harris)
National Public Safety Telecommunications Council (NPSTC)
National Spectrum Management Association (NSMA)

List of Reply Commenters

Motorola, Inc. (Motorola)
NSMA

List of Cited Commenters to the *Fourth FNPRM*

Harris

Motorola Solutions, Inc. (MSI)
NPSTC

APPENDIX B

Final Rules

Part 90 of Chapter 1 of Title 47 of the Code of Federal Regulations is amended as follows:

The authority citation for Part 90 continues to read as follows:

Authority: Sections 4(i), 11, 303(g), 303(r), and 332(c)(7) of the Communications Act of 1934, as amended, 47 U.S.C. 154(i), 161, 303(g), 303(r), and 332(c)(7).

1. Section 90.20 is amended by revising the Frequency or band entries 453.03125, 453.04375, 462.950, 467.950, 467.95625, 467.9625, 467.96875, 467.975, 467.98125, 467.9875, 467.99375 and 1,427 to 1,432 in the Public Safety Pool Frequency Table of paragraph (c)(3); and revising the Frequencies base and mobile entries 463.075 in the table of paragraph (d)(66)(i) to read as follows:

§ 90.20 Public Safety Pool.

* * * * *

(c) * * *
(3) * * *

PUBLIC SAFETY POOL FREQUENCY TABLE

Frequency or band	Class of station(s)	Limitations	Coordinator
* *	* *	* *	*
Megahertz			
* *	* *	* *	*
453.03125	Base or mobile	44, 59, 62, 84.	PM
* *	* *	* *	*
453.04375	.....do	44, 59, 62, 84.	PM
* *	* *	* *	*
462.950 .....	.....do	10, 65	PM
* *	* *	* *	*
467.950 .....	.....do	10, 65	PM
467.95625 .....	.....do	10, 44, 65	PM
467.9625 .....	.....do	10, 27, 65	PM
467.96875 .....	.....do	10, 44, 65	PM
467.975 .....	.....do	10, 65	PM
467.98125 .....	.....do	10, 44, 65	PM
467.9875 .....	.....do	10, 27, 65	PM
467.99375 .....	.....do	10, 44, 65	PM
* *	* *	* *	*
1,427 to 1,432	Base, mobile or operational fixed.	72	
* *	* *	* *	*

* * * * *

- (d) * * *
- (66) * * *
- (i) * * *

Frequencies base and mobile (megahertz)	Mobile only (MHz)	Channel name
* * *	* * *	*
463.075	468.075	MED-4
* * *	* * *	*

* * * * *

- 2. Section 90.175 is amended by adding a new paragraph (j)(22) to read as follows:

§ 90.175 Frequency coordinator requirements.

* * * * *

- (j) * * *

(22) Applications for frequencies in the 4940-4990 MHz band. *See* § 90.1209 of this chapter for further information.

- 3. Section 90.1213 is revised to read as follows:

§ 90.1213 Band plan.

(a) The following channel center frequencies are permitted to be aggregated for channel bandwidths of 5, 10, 15 or 20 MHz as described in paragraph (b) of this section. Channel numbers 1 through 5 and 14 through 18 are 1 MHz bandwidth channels, and channel numbers 6 through 13 are 5 MHz bandwidth channels.

Center Frequency (MHz)	Bandwidth (MHz)	Channel Nos.
4940.5	1	1
4941.5	1	2
4942.5	1	3
4943.5	1	4
4944.5	1	5
4947.5	5	6
4952.5	5	7
4957.5	5	8
4962.5	5	9
4967.5	5	10
4972.5	5	11
4977.5	5	12
4982.5	5	13
4985.5	1	14
4986.5	1	15
4987.5	1	16
4988.5	1	17
4989.5	1	18

(b) The following tables list center frequencies to be licensed for aggregated channels only. A license may contain any combination of bandwidths from aggregated channels provided that the bandwidths do not overlap. The bandwidth edges (lower and upper frequencies) are provided to aid in planning.

(1) 5 MHz bandwidth aggregation:

Center Frequency (MHz)	Channel Nos. Employed	Lower Frequency (MHz)	Upper Frequency (MHz)
4942.5	1 to 5*	4940	4945
4947.5	6	4945	4950
4952.5	7	4950	4955
4957.5	8	4955	4960
4962.5	9	4960	4965

4967.5	10	4965	4970
4972.5	11	4970	4975
4977.5	12	4975	4980
4982.5	13	4980	4985
4987.5	14 to 18*	4985	4990

*Licensees should avoid using these channels in aggregations unless all other channels are blocked.

(2) 10 MHz bandwidth aggregation:

Center Frequency (MHz)	Channel Nos. Employed	Lower Frequency (MHz)	Upper Frequency (MHz)
4945	1 to 6*	4940	4950
4950	6 & 7	4945	4955
4955	7 & 8	4950	4960
4960	8 & 9	4955	4965
4965	9 & 10	4960	4970
4970	10 & 11	4965	4975
4975	11 & 12	4970	4980
4980	12 & 13	4975	4985
4985	13 to 18*	4980	4990

*Licensees should avoid using these channels in aggregations unless all other channels are blocked.

(3) 15 MHz bandwidth aggregation:

Center Frequency (MHz)	Channel Nos. Employed	Lower Frequency (MHz)	Upper Frequency (MHz)
4947.5	1 to 7*	4940	4955
4952.5	6 to 8	4945	4960
4957.5	7 to 9	4950	4965
4962.5	8 to 10	4955	4970
4967.5	9 to 11	4960	4975
4972.5	10 to 12	4965	4980
4977.5	11 to 13	4970	4985
4982.5	12 to 18*	4975	4990

*Licensees should avoid using these channels in aggregations unless all other channels are blocked.

(4) 20 MHz bandwidth aggregation:

Center Frequency (MHz)	Channel Nos. Employed	Lower Frequency (MHz)	Upper Frequency (MHz)
4950	1 to 8*	4940	4960
4955	6 to 9	4945	4965
4960	7 to 10	4950	4970
4965	8 to 11	4955	4975
4970	9 to 12	4960	4980
4975	10 to 13	4965	4985
4980	11 to 18*	4970	4990

*Licensees should avoid using these channels in aggregations unless all other channels are blocked.

APPENDIX C

Final Regulatory Flexibility Analysis

1. As required by the Regulatory Flexibility Act of 1980, as amended (RFA),¹ the Commission incorporated an Initial Regulatory Flexibility Analysis (IRFA) in the *Further Notice of Proposed Rulemaking (Further Notice)*.² The Commission sought written public comment on the proposals in the *Further Notice*, including comment on the IRFA. This present Final Regulatory Flexibility Analysis (FRFA) conforms to the RFA.³

A. Need for, and Objectives of, the Report and Order

2. We believe it appropriate to review all of our regulations relating to administering Private Land Mobile Radio (PLMR) Services to determine which regulations can be clarified, streamlined or eliminated. The Fourth Report and Order in this proceeding is part of our continuing effort to provide clear and concise rules that (1) facilitate adoption of new wireless technologies, devices and services, and (2) are easy for licensees to comprehend and understand. Additionally, we believe the decisions adopted in the Fourth Report and Order will (3) promote flexibility and more efficient use of the spectrum, (4) prevent unnecessary administrative burdens from being imposed on licensees, (5) allow licensees to better meet their communication needs, and (6) maintain public accountability for use of public safety spectrum.

3. The Fourth Report and Order contains four decisions. First, we correct an inadvertent omission from Section 90.175 of the Commission's rules. When the Commission crafted the rules for the 4940-4990 MHz band (4.9 GHz), applicants for 4.9 GHz frequencies were exempt from certified frequency coordination requirements.⁴ This exemption was deleted inadvertently in the course of an unrelated rulemaking. We reinstate the exemption to remove uncertainty and serve the Commission's original intent. Second, we decline to adopt any additional frequency coordination requirements for the 4.9 GHz band, pending further review of possible alternatives in the accompanying *Fifth Further Notice of Proposed Rulemaking*. Third, in the band plan of Section 90.1213, we correct the channel number 14 bandwidth from five megahertz to one megahertz, and we amend the table in Section 90.1213 to list the center frequencies that applicants should request for every possible channel aggregation permitted in the rules. These amendments to the band plan will improve spectrum efficiency and eliminate confusion with respect to channel licensing. Fourth, we correct several typographical and ministerial errors in Section 90.20 of the Commission's rules relating to the Public Safety Pool Frequency Table and associated limitations.

B. Summary of Significant Issues Raised by Public comments in Response to the IRFA

4. The public submitted no comments specifically in response to the IRFA.

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

² Amendment of Part 90 of the Commission's Rules, *Report and Order and Further Notice of Proposed Rulemaking*, WP Docket No. 07-100, 24 FCC Rcd 4298, 4336 (2009) (*Further Notice*).

³ See 5 U.S.C. § 604.

⁴ 47 C.F.R. § 90.175 generally requires that applications for new frequencies must include a showing of frequency coordination. In many frequency bands, a statement is required from the frequency coordinator recommending the most appropriate frequency. *Id.*

C. Description and Estimate of the Number of Small Entities To Which the Final 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 rules adopted. The RFA defines “small entity” as having the same meaning as the terms “small business,” “small organization,” and “small governmental jurisdiction.”⁵ In addition, we note that the term “small business” has the same meaning as the term “small business concern” under the Small Business Act, unless the Commission has developed one or more definitions that are appropriate to its activities.⁶ Under the Small Business Act, a “small business concern is one that: (1) is independently owned and operated; (2) is not dominant in its field of operation; and (3) meets any additional criteria established by the Small Business Administration (SBA).”⁷ A small organization is generally “any not-for-profit enterprise which is independently owned and operated and is not dominant in its field.”⁸ Below, we further describe and estimate the number of small entity licensees and regulatees that may be affected by the rules changes adopted in this Fourth Report and Order.

6. *Small Businesses, Small Organizations, and Small Governmental Jurisdictions.* Our action may, over time, affect small entities that are not easily categorized at present. We therefore describe here, at the outset, three comprehensive, statutory small entity size standards.⁹ First, nationwide, there are a total of approximately 27.5 million small businesses, according to the SBA.¹⁰ In addition, 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 2007, there were approximately 1,621,315 small organizations.¹² Finally, the term “small governmental jurisdiction” is defined generally as “governments of cities, towns, townships, villages, school districts, or special districts, with a population of less than fifty thousand.”¹³ Census Bureau data for 2007 indicate that there were 89,476 local governmental jurisdictions in the United States.¹⁴ We estimate that, of this total, as many as 88,506

⁵ See 5 U.S.C. § 601(6).

⁶ See 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, established one or more definitions of such term which are appropriate to the activities of the agency and publishes such definition in the Federal Register.”

⁷ See Small Business Act, 5 U.S.C. § 632 (1996).

⁸ See 5 U.S.C. § 601(4).

⁹ See 5 U.S.C. §§ 601(3)–(6).

¹⁰ See SBA, Office of Advocacy, “Frequently Asked Questions,” web.sba.gov/faqs (last visited May 6, 2011; figures are from 2009).

¹¹ 5 U.S.C. § 601(4).

¹² INDEPENDENT SECTOR, THE NEW NONPROFIT ALMANAC & DESK REFERENCE (2010).

¹³ See 5 U.S.C. § 601(5).

¹⁴ U.S. CENSUS BUREAU, STATISTICAL ABSTRACT OF THE UNITED STATES: 2012, Section 8, at 267, Table 428.

entities may qualify as “small governmental jurisdictions.”¹⁵ These entities are included here because many of these small government jurisdictions are also licensees.

7. *Public Safety Radio Licensees.* As a general matter, Public Safety Radio Pool licensees include police, fire, local government, forestry conservation, highway maintenance, and emergency medical services.¹⁶ Because of the vast array of public safety licensees, the Commission has not developed a small business size standard specifically applicable to public safety licensees. The SBA rules contain a definition for Wireless Telecommunications Carriers (except Satellite) which encompasses business entities engaged in radiotelephone communications employing no more than 1,500 persons.¹⁷ With respect to local governments, in particular, since many governmental entities comprise the licensees for these services, we include under public safety services the number of government entities affected. According to Commission records, a total of approximately 133,870 licenses operate within these services.¹⁸

8. *Private Land Mobile Radio Licensees.* 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. Because of the vast array of PLMR users, the Commission has not developed a small business size standard specifically applicable to PLMR users. The SBA rules, however, contain a definition for Wireless Telecommunications Carriers (except Satellite) which encompasses business entities engaged in radiotelephone communications employing no more than 1,500 persons.¹⁹ According to the

¹⁵ The 2007 U.S. Census data for small governmental organizations indicate that there were 89,476 “Local Governments” in 2007. (U.S. CENSUS BUREAU, STATISTICAL ABSTRACT OF THE UNITED STATES 2012, Table 428.) The criterion by which the size of such local governments is determined to be small is a population of 50,000. However, since the Census Bureau does not specifically apply that criterion, it cannot be determined with precision how many of such local governmental organizations is small. Measured by a criterion of a population of 50,000, many specific sub-entities in this category seem more likely than larger county-level governmental organizations to have small populations. Accordingly, of the 89,746 small governmental organizations identified in the 2007 Census, the Commission estimates that a substantial majority is small.

¹⁶ See subparts A and B of Part 90 of the Commission’s Rules, 47 C.F.R. §§ 90.1-90.22. Police licensees serve state, county, and municipal enforcement through telephony (voice), telegraphy (code), and teletype and facsimile (printed material). Fire licensees are comprised of private volunteer or professional fire companies, as well as units under governmental control. Public Safety Radio Pool licensees also include state, county, or municipal entities that use radio for official purposes. State departments of conservation and private forest organizations comprise forestry service licensees that set up communications networks among fire lookout towers and ground crews. State and local governments are highway maintenance licensees that provide emergency and routine communications to aid other public safety services to keep main roads safe for vehicular traffic. Emergency medical licensees use these channels for emergency medical service communications related to the delivery of emergency medical treatment. Additional licensees include medical services, rescue organizations, veterinarians, persons with disabilities, disaster relief organizations, school buses, beach patrols, establishments in isolated areas, communications standby facilities, and emergency repair of public communications facilities.

¹⁷ See 13 C.F.R. § 121.201, NAICS code 517210.

¹⁸ This figure was derived from Commission licensing records as of June 27, 2008. Licensing numbers change on a daily basis. We do not expect this number to be significantly smaller today. This does not indicate the number of licensees, as licensees may hold multiple licenses. There is no information currently available about the number of public safety licensees that have less than 1,500 employees.

¹⁹ See 13 C.F.R. § 121.201, NAICS code 517210.

Commission's records, a total of approximately 470,316 licenses comprise PLMR users.²⁰ Despite the lack of specific information, however, the Commission believes that a substantial number of PLMR licensees may be small entities. There are 2,442 licenses in the 4.9 GHz band, based on an FCC Universal Licensing System search of May 23, 2012.²¹ We estimate that fewer than 2,442 public safety radio licensees hold these licenses because certain entities may have multiple licenses.

9. *Frequency Coordinators.* Neither the Commission nor the SBA has developed a small business size standard specifically applicable to spectrum frequency coordinators. The Commission has certified nine frequency coordinators to coordinate frequencies allocated for public safety use.²² The Commission has not developed a small business size standard specifically applicable to frequency coordinators. The SBA rules, however, contain a definition for Wireless Telecommunications Carriers (except Satellite) which encompasses business entities engaged in radiotelephone communications employing no more than 1,500 persons.²³ Under this category and size standard, we estimate that a majority of frequency coordinators can be considered small.

10. *Radio Frequency (RF) Equipment Manufacturers.* The Census Bureau defines this category as follows: "This industry comprises establishments primarily engaged in manufacturing radio and television broadcast and wireless communications equipment. Examples of products made by these establishments are: transmitting and receiving antennas, cable television equipment, GPS equipment, pagers, cellular phones, mobile communications equipment, and radio and television studio and broadcasting equipment."²⁴ The SBA has developed a small business size standard for Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing, which is: all such firms having 750 or fewer employees.²⁵ According to Census Bureau data for 2002, a total of 1,041 establishments in this category operated for the entire year.²⁶ Of this total, 1,010 had employment of fewer than 500, and an additional 13 had employment of 500 to 999.²⁷ Thus, under this size standard, we consider the majority of firms small.

²⁰ This figure was derived from through Commission licensing records as of June 3, 2008. Licensing numbers change on a daily basis. This does not indicate the number of licensees, as licensees may hold multiple licenses. There is no information currently available about the number of PLMR licensees that have less than 1,500 employees.

²¹ Based on an FCC Universal Licensing System search of May 23, 2012. Search parameters: Radio Service = PA – Public Safety 4940-4990 MHz Band; Authorization Type = Regular; Status = Active.

²² See <http://www.fcc.gov/pshs/public-safety-spectrum/coord.html> (last visited June 26, 2008).

²³ See 13 C.F.R. § 121.201, NAICS code 517210.

²⁴ U.S. Census Bureau, 2012 NAICS Definitions, "334220 Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing"; <http://www.census.gov/eos/www/naics/>, 2012 NAICS code 334220.

²⁵ See 13 C.F.R. § 121.201, NAICS code 334220.

²⁶ U.S. Census Bureau, American FactFinder, 2002 Economic Census, Industry Series, Industry Statistics by Employment Size, NAICS code 334220 (released May 26, 2005); <http://factfinder2.census.gov>. Data more recent than 2002 is not yet available. The number of "establishments" is a less helpful indicator of small business prevalence in this context than would be the number of "firms" or "companies," because the latter take into account the concept of common ownership or control. Any single physical location for an entity is an establishment, even though that location may be owned by a different establishment. Thus, these numbers may reflect inflated numbers of businesses in this category, including the numbers of small businesses. In this category, the Census breaks-out data for firms or companies only to give the total number of such entities for 2002, which was 929.

²⁷ *Id.* An additional eighteen establishments had employment of 1,000 or more.

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

11. There are no projected reporting, recordkeeping or other compliance requirements.

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

12. The RFA requires an agency to describe any significant alternatives that it has considered in reaching its proposed 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.²⁸

13. None of the decisions in this Fourth Report and Order impose any adverse burden of significant economic impact on small entities. The decision to reinstate the exemption from certified frequency coordination imposes no administrative or economic burdens on licensees, and we anticipate minimal impact on frequency coordinators because the requirement was an inadvertent error that the Commission never enforced. The decisions to correct the band plan and the Public Safety Pool frequency table impose no adverse burdens of significant economic impact on small entities. None of these changes restrict or limit licensee operation beyond what is currently authorized by our rules.

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

14. None.

²⁸ See 5 U.S.C. § 603(c).

APPENDIX D

Proposed Rules

Part 90 of Chapter 1 of Title 47 of the Code of Federal Regulations is amended as follows:

The authority citation for Part 90 continues to read as follows:

Authority: Sections 4(i), 11, 303(g), 303(r), and 332(c)(7) of the Communications Act of 1934, as amended, 47 U.S.C. 154(i), 161, 303(g), 303(r), and 332(c)(7).

1. Section 2.106, the Table of Frequency Allocations, in the frequency range 2655-4990 MHz (UHF/SHF), under United States Table, Non-Federal Table, the entry for 4940-4990 is revised as follows:

§ 2.106 Table of Frequency Allocations.

* * *

4940-4990 FIXED MOBILE Aeronautical Mobile 5.339 US311 US342
--

* * *

2. Section 90.1203 is revised to read as follows:

§ 90.1203 Eligibility.

(a) The following groups of entities are eligible to hold a Commission license for systems operating in the 4940-4990 MHz band on a primary basis.

(1) Entities providing public safety services as defined under § 90.523. All of the requirements and conditions set forth in that section also govern authorizations in the 4940-4990 MHz band.

(2) Critical infrastructure industry (CII) entities as defined under § 90.7.

* * * * *

3. Section 90.1205 is revised to read as follows:

§ 90.1205 Permissible operations.

* * * * *

(c) Aeronautical mobile operations are permitted on a secondary, non-interference basis to 4.9 GHz terrestrial services under the following restrictions. Altitude may not exceed 457 meters (1500 feet) above ground. Licensees may use only low power devices as defined by § 90.1215 for aeronautical mobile use. All applications for aeronautical operation require prior Commission approval. The applicant shall provide a description of proposed operation to demonstrate that the proposed aeronautical mobile operations protect radio astronomy operations and 4.9 GHz terrestrial services from interference. Applicants shall submit their applications to their respective regional planning committee or the National Association of Regional Planning Committees for coordination. The applicant shall certify that it has served a copy of the application to all radio astronomy observatories listed in the Table of Frequency Allocations, § 2.106 footnote US311 of this chapter, whose geographic boundaries fall within **[distance to be determined]** kilometers of the edge of the proposed aeronautical operation. The Commission will coordinate all applications for aeronautical mobile operation with the National Telecommunications and Information Administration. The Commission has the discretion to impose special conditions and operating restrictions on individual licenses as necessary to reduce risk of interference to radio astronomy operations and 4.9 GHz terrestrial services.

4. Section 90.1209 is revised to read as follows:

§ 90.1209 Policies governing the use of the 4940-4990 MHz band.

* * * * *

(b) Each application for a new frequency assignment or for a change in existing facilities as listed in § 1.929(c)(4) must be submitted through the applicable regional planning committee (RPC) for coordination. In areas without active RPCs, all licensees shall cooperate in the selection and use of channels in order to reduce interference and make the most effective use of the authorized facilities. A database identifying the locations of registered stations will be available at <http://wireless.fcc.gov/uls>. RPCs and licensees should examine this database before seeking station authorization, and make every effort to ensure that their fixed and base stations operate at a location, and with technical parameters, that will minimize the potential to cause and receive interference. Point-to-point stations must employ either horizontal or vertical polarization; point-to-point unpolarized transmissions are prohibited. Licensees of stations suffering or causing harmful interference are expected to cooperate and resolve this problem by mutually satisfactory arrangements. If licensees are unable to do so, the Commission may impose restrictions including specifying the transmitter power, antenna height, or area or hours of operation of the stations concerned. Further, the Commission may prohibit the use of any 4.9 GHz channel under a system license at a given geographical location when, in the judgment of the Commission, its use in that location is not in the public interest.

5. Section 90.1213 is revised to read as follows:

§ 90.1213 Band plan.

(a) The following channel center frequencies are permitted to be aggregated for channel bandwidths of 5, 10, 15 or 20 MHz as described in paragraph (b) of this section. Channel numbers 1 through 5 and 14 through 18 are 1 MHz bandwidth channels and channel

numbers 6 through 13 are 5 MHz bandwidth channels. Channel numbers 1 through 5 and 14 through 18 are designated for narrow bandwidth operations and should be used in aggregations only if all other 5 MHz channels are blocked.

6. Section 90.1219 is created to read as follows:

§ 90.1219 Deployment reporting.

(a) Licensees in the 4.9 GHz band shall file deployment reports with the Commission. Licensees may attach deployment reports to FCC Form 601. The report shall contain the following information:

- (1) status of equipment development and purchase, including number of devices and users;
- (2) site development, including use of existing towers;
- (3) deployments and upgrades (commencement and completion), including site information and location; and
- (4) applications in development or in use.

(b) During the first year following the initial grant or modification of a 4.9 GHz license, reports are due every three months after the grant date. After the first anniversary of the license grant, licensees must file deployment reports on an annual basis.

APPENDIX E**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 Fifth Further Notice of Proposed Rulemaking (Fifth FNPRM). The Commission requests written public comments on this IRFA. Comments must be identified as responses to the IRFA and must be filed by the deadlines for comments on the Fifth FNPRM provided in Section IV of the item. The Commission will send a copy of the Fifth FNPRM, including this IRFA, to the Chief Counsel for Advocacy of the Small Business Administration (SBA).² In addition, the Commission will ensure that the Fifth FNPRM and IRFA (or summaries thereof) will be published in the Federal Register.³

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

2. We are issuing a Fifth FNPRM to encourage greater use and improved spectrum efficiency of the 4.9 GHz band. We seek to implement changes to our policies and regulations that promote optimal use, innovation, and investment. In 2002, the Commission envisioned that the band would support new broadband applications such as high-speed digital technologies and wireless local area networks (WLANs) for incident scene management, dispatch operations, and vehicular/personal communications. Notwithstanding the Commission's action to accord primary status to broadband permanent fixed point-to-point links in 2009, the development of the 4.9 GHz band to date appears to have fallen short of its potential. Today's Fifth FNPRM will enable the Commission to develop a record on several issues, including 4.9 GHz coordination, eligibility, licensing, band plan, power and antenna gain, aeronautical mobile use, standards, and how the 4.9 GHz band can complement the 700 MHz Public Safety broadband spectrum allocation.

B. Legal Basis

3. Interested parties may find authority for the actions proposed in this Fifth FNPRM in sections 1, 4(i), 301, 302, 303, 308, 310, 316, 324, and 403 of the Communications Act of 1934, as amended, 47 U.S.C. §§ 151, 154(i), 301, 302, 303, 308, 310, 316, 324, and 403, and Section 6213 of the Middle Class Tax Relief and Job Creation Act of 2012, Pub. L. No. 112-96, 126 Stat. 156 (2012).

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

4. 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 rules adopted herein.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

¹ See 5 U.S.C. § 603. The RFA, see 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.*

⁴ 5 U.S.C. § 604(a)(3).

⁵ 5 U.S.C. § 601(6).

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 Small Business Administration (“SBA”).⁷ Below, we further describe and estimate the number of small entity licensees and regulatees that may be affected by the rules changes we propose in this Fifth FNPRM.

5. *Small Businesses, Small Organizations, and Small Governmental Jurisdictions.* Our action may, over time, affect small entities that are not easily categorized at present. We therefore describe here, at the outset, three comprehensive, statutory small entity size standards.⁸ First, nationwide, there are a total of approximately 27.5 million small businesses, according to the SBA.⁹ In addition, a “small organization” is generally “any not-for-profit enterprise which is independently owned and operated and is not dominant in its field.”¹⁰ Nationwide, as of 2007, there were approximately 1,621,315 small organizations.¹¹ Finally, the term “small governmental jurisdiction” is defined generally as “governments of cities, towns, townships, villages, school districts, or special districts, with a population of less than fifty thousand.”¹² As of 2007, the U.S. Census Bureau identifies approximately 89,476 governmental jurisdictions in the United States.¹³ This number includes 39,044 county governments, municipalities, and townships, of which 37,546 (approximately 96.2 percent) have populations of fewer than 50,000, and of which 1,498 have populations of 50,000 or more. Thus, we estimate the number of small governmental jurisdictions overall to be 86,043 or fewer. These entities are included here because many of these small government jurisdictions are also licensees.

6. *Public Safety Radio Licensees.* As a general matter, Public Safety Radio Pool licensees include police, fire, local government, forestry conservation, highway maintenance, and emergency medical services.¹⁴ Because of the vast array of public safety licensees, the Commission has not

⁶ 5 U.S.C. § 601(3) (incorporating by reference the definition of “small-business concern” in the Small Business Act, 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.” 5 U.S.C. § 601(3).

⁷ 15 U.S.C. § 632.

⁸ See 5 U.S.C. §§ 601(3)–(6).

⁹ See SBA, Office of Advocacy, “Frequently Asked Questions,” web.sba.gov/faqs (last visited May 6, 2011; figures are from 2009).

¹⁰ 5 U.S.C. § 601(4).

¹¹ INDEPENDENT SECTOR, THE NEW NONPROFIT ALMANAC & DESK REFERENCE (2010).

¹² 5 U.S.C. § 601(5).

¹³ U.S. CENSUS BUREAU, STATISTICAL ABSTRACT OF THE UNITED STATES: 2012, Table 428.

¹⁴ See subparts A and B of Part 90 of the Commission’s Rules, 47 C.F.R. §§ 90.1-90.22. Police licensees serve state, county, and municipal enforcement through telephony (voice), telegraphy (code), and teletype and facsimile (printed material). Fire licensees are comprised of private volunteer or professional fire companies, as well as units under governmental control. Public Safety Radio Pool licensees also include state, county, or municipal entities that use radio for official purposes. State departments of conservation and private forest organizations comprise forestry service licensees that set up communications networks among fire lookout towers and ground crews. State and local governments are highway maintenance licensees that provide emergency and routine communications to aid other public safety services to keep main roads safe for vehicular traffic. Emergency medical licensees use these channels for emergency medical service communications related to the delivery of emergency medical treatment. Additional (continued....)

developed a small business size standard specifically applicable to public safety licensees. The SBA rules contain a definition for Wireless Telecommunications Carriers (except Satellite) which encompasses business entities engaged in radiotelephone communications employing no more than 1,500 persons.¹⁵ With respect to local governments, in particular, since many governmental entities comprise the licensees for these services, we include under public safety services the number of government entities affected. According to Commission records, there are a total of approximately 133,870 licenses within these services.¹⁶ There are 2,442 licenses in the 4.9 GHz band, based on an FCC Universal Licensing System search of May 23, 2012.¹⁷ We estimate that fewer than 2,442 public safety radio licensees hold these licenses because certain entities may have multiple licenses.

7. *Regional Planning Committees.* Neither the Commission nor the SBA has developed a small business size standard specifically applicable to Regional Planning Committees (RPCs) and the National Regional Planning Council (NRPC). As described by the NRPC, “[t]he National Regional Planning Council (NRPC) is an advocacy body formed in 2007 that supports public safety communications spectrum management by Regional Planning Committees (RPC) in the 700 MHz and 800 MHz NPSPAC public safety spectrum as required by the Federal Communications Commission.”¹⁸ The NRPC states that “Regional Planning Committees consist of public safety volunteer spectrum planners and members that dedicate their time, in addition to the time spent in their regular positions, to coordinate spectrum efficiently and effectively for the purpose of making it available to public safety agency applicants in their respective region.”¹⁹ There are 54 formed RPCs and one unformed RPC.²⁰ The Commission has not developed a small business size standard specifically applicable to RPCs and the NRPC. The SBA rules, however, contain a definition for Wireless Telecommunications Carriers (except Satellite) which encompasses business entities engaged in radiotelephone communications employing no more than 1,500 persons.²¹ Under this category and size standard, we estimate that all of the RPCs and the NRPC can be considered small.

8. *Radio Frequency (RF) Equipment Manufacturers.* The Census Bureau defines this category as follows: “This industry comprises establishments primarily engaged in manufacturing radio and television broadcast and wireless communications equipment. Examples of products made by these establishments are: transmitting and receiving antennas, cable television equipment, GPS equipment, pagers, cellular phones, mobile communications equipment, and radio and television studio and
(Continued from previous page) _____

licensees include medical services, rescue organizations, veterinarians, persons with disabilities, disaster relief organizations, school buses, beach patrols, establishments in isolated areas, communications standby facilities, and emergency repair of public communications facilities.

¹⁵ See 13 C.F.R. § 121.201, NAICS code 517210.

¹⁶ This figure was derived from Commission licensing records as of June 27, 2008. Licensing numbers change on a daily basis. We do not expect this number to be significantly smaller today. This does not indicate the number of licensees, as licensees may hold multiple licenses. There is no information currently available about the number of public safety licensees that have less than 1,500 employees.

¹⁷ Based on an FCC Universal Licensing System search of May 23, 2012. Search parameters: Radio Service = PA – Public Safety 4940-4990 MHz Band; Authorization Type = Regular; Status = Active.

¹⁸ See Petition for Rulemaking to allow Aircraft voice operations on Secondary Trunking Channels in the 700 MHz band, RM-11433, Comments of the National Regional Planning Council at 1 (filed July 15, 2011).

¹⁹ *Id.*

²⁰ See <http://publicsafety.fcc.gov/pshs/public-safety-spectrum/700-MHz/rpc-map.htm>.

²¹ See 13 C.F.R. § 121.201, NAICS code 517210.

broadcasting equipment.”²² The SBA has developed a small business size standard for Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing, which is: all such firms having 750 or fewer employees.²³ According to Census Bureau data for 2002, a total of 1,041 establishments in this category operated for the entire year.²⁴ Of this total, 1,010 had employment of fewer than 500, and an additional 13 had employment of 500 to 999.²⁵ Thus, under this size standard, we consider the majority of firms small.

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

9. The proposal to mandate a registration database for coordination purposes would impose a one-time information collection requirement on 4.9 GHz licensees. The information collected would include base station technical parameters such as coordinates, antenna height, and antenna gain. Collected information also would include permanent fixed receiver location in the case of point-to-point links. The information would be collected on Form 601 in the Commission’s Universal Licensing System database. While any person may complete and submit Form 601 without qualification, as a practical matter, a person with a technical background is best suited for this task. If the applicant is not technically inclined, there may be costs associated with compensating engineering or technical staff or consultants to comply with this information collection. However, we expect there to be no cost in terms of FCC fees associated with this information collection because public safety entities are exempt from application fees pursuant to 47 C.F.R. § 1.1116(b). The purpose of this proposed information collection requirement is to make this information available to coordinating entities to ensure that these operations are protected from interference.

10. The proposal to permit aeronautical mobile operation would impose a one-time information collection requirement on applicants for such operation. The information collected would include a description of proposed operation to demonstrate that the proposed aeronautical mobile operations protect radio astronomy operations and 4.9 GHz terrestrial services from interference. Applicants would submit their applications to their respective regional planning committee or the National Association of Regional Planning Committees for coordination. The collected information also would include a certification that the applicant has served a copy of the application to all radio astronomy observatories listed in the Table of Frequency Allocations, § 2.106 footnote US311 of this chapter, whose geographic boundaries fall within a certain distance, to be determined, of the edge of the proposed aeronautical operation. Similar to the Form 601 information collection described above, this information collection is technical in nature and may incur costs associated with compensating engineering or

²² U.S. Census Bureau, 2012 NAICS Definitions, “334220 Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing”; <http://www.census.gov/eos/www/naics/>, 2012 NAICS Search code “334220”.

²³ See 13 C.F.R. § 121.201, NAICS code 334220.

²⁴ U.S. Census Bureau, American FactFinder, 2002 Economic Census, Industry Series, Industry Statistics by Employment Size, NAICS code 334220 (released May 26, 2005); <http://factfinder2.census.gov>. Data more recent than 2002 is not yet available. The number of “establishments” is a less helpful indicator of small business prevalence in this context than would be the number of “firms” or “companies,” because the latter take into account the concept of common ownership or control. Any single physical location for an entity is an establishment, even though that location may be owned by a different establishment. Thus, these numbers may reflect inflated numbers of businesses in this category, including the numbers of small businesses. In this category, the Census breaks-out data for firms or companies only to give the total number of such entities for 2002, which was 929.

²⁵ *Id.* An additional eighteen establishments had employment of 1,000 or more.

technical staff or consultants. The purpose of this proposed information collection requirement is to ensure that the proposed aeronautical mobile operations protect radio astronomy operations and 4.9 GHz terrestrial services from interference, and to make affected radio astronomy observatories aware of the proposed aeronautical use so that they can identify the source of any actual interference that may occur.

11. The proposal to require deployment reporting would impose a periodic information requirement on 4.9 GHz licensees. The information collected would include: status of equipment development and purchase, including number of devices and users; site development, including use of existing towers; deployments and upgrades (commencement and completion), including site information and location; and applications in development or in use. Similar to the information collections described above, this information collection is technical in nature and may incur costs associated with compensating engineering or technical staff or consultants. The purpose of this proposed information collection requirement is to keep the Commission informed on how licensees are using the 4.9 GHz band in order to ensure its ability to tailor its rules to promote more efficient use of this frequency band. The Fifth FNRPM seeks comment on collecting this information on a quarterly basis for the first year following a license grant, and on an annual basis thereafter. The Commission likely would collect this information on FCC Form 601 in the Commission's Universal Licensing System.

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

12. 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 and reporting requirements under the rule for such 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 such small entities.”²⁶

13. The proposal to require coordination conducted by RPCs and the NRPC may impose economic impact on small entities. The proposal would require RPCs and the NRPC to coordinate applications for operations in the 4.9 GHz band, subjecting them to economic impact associated with these duties. RPCs and the NRPC may opt to pass along the cost of coordination to applicants by the way of coordination fees. We note that public safety radio licensees generally are accustomed to the economic impact associated with frequency coordination requirements in other public safety frequency bands.²⁷ We considered the alternative of requiring licensee-to-licensure coordination procedures under Part 101 as a means to avoid interference prior to operation, but this alternative has drawbacks. As described in the Fifth FNPRM, commenters argue that such a procedure would create confusion, would be burdensome, and would slow the deployment of 4.9 GHz networks. Moreover, commenters argue that such a procedure could lead to protracted and burdensome negotiations in attempts to resolve interference disputes. We also considered exemption of coverage of the rule for small entities. However, given that most public safety radio licensees are governmental entities,²⁸ and that most governmental entities are small entities, it follows that most public safety radio licensees are small entities. An exemption from coordination for most public safety radio licensees would render any coordination proposal effectively meaningless.

²⁶ 5 U.S.C. §§ 603(c)(1)-(c)(4).

²⁷ For a list of frequency bands subject to frequency coordination requirements, see 47 C.F.R. § 90.175.

²⁸ See *supra* n. 14.

14. The proposal to require a registration database for coordination purposes would impose an information collection requirement on licensees as described above, but we expect there to be no cost in terms of fees associated with this information collection if future commenters support a Commission-administered database because public safety entities are exempt from application fees pursuant to 47 C.F.R. § 1.1116(b). We note that all public safety radio licensees are already subject to an information collection associated with applying for a license by way of FCC Form 601. A benefit of a Commission-administered registration database is that information collection requirements for both license application and registration would be consolidated on the same Form FCC 601. However, if future commenters support third-party database administrators, the latter may charge registration fees. Further, with a third-party database, the information collection for registration would not be consolidated with the information collection associated with applying for a license, but rather separated and potentially more confusing for small entities. We considered the alternative not to require a registration database, but this is an unattractive option because coordinators and licensees would not be able to provide interference protection to certain elements of 4.9 GHz band networks without the information that the database would host.

15. The proposal to expand eligibility would impose no significant economic impact on small entities because the proposal is a permissive rule change in nature as opposed to a limiting or restrictive rule change.

16. The Fifth FNPRM seeks comment on usage-specific licensing, jurisdictional licensing, and primary permanent fixed links, but the item does not propose specific rule changes at this time. Usage-specific licensing would require separate licenses for each classes of use, such as base-mobile, permanent fixed, and mobile-only. Usage-specific licensing may add administrative burdens to the licensing process by requiring an applicant to file a greater quantity of applications. We are considering the alternative to maintain the status quo, that is, to allow all classes of use on a single license, which would maintain the status quo regarding the economic impact of the licensing process on applicants. Jurisdictional licensing would impose potentially significant economic impact on licensees by requiring cooperation and planning amongst agencies within a jurisdiction prior to obtaining a single 4.9 GHz band license for the jurisdiction. Allowing all permanent fixed links on a primary basis could lead to protracted and burdensome negotiations in attempts to resolve interference disputes. We are considering the alternative to maintain the status quo: permanent fixed links that provide broadband service are permitted on a primary basis, while links that carry narrowband traffic are secondary. For all the licensing schemes mentioned in this paragraph, the status quo represents already consolidated or simplified compliance requirements, and thus, we believe the status quo would minimize significant economic impact on small entities.

17. The Fifth FNPRM's questions on how the 4.9 GHz band can complement 700 MHz broadband networks would have no significant economic impact on small entities because the item proposes no restrictive rule changes at this time in this regard.

18. The Fifth FNPRM seeks comment about the 4.9 GHz band plan, channel aggregations, designating the 1-MHz bandwidth channels for narrowband operations, and designating certain channels for specific uses. Any changes to the band plan may have significant economic impact on RF equipment manufacturers because the changes may necessitate redesign and Commission certification of radio equipment. We are considering an alternative to grandfather RF equipment manufacturers, either on a long term or on an indefinite basis, so that they may continue to design and manufacture equipment that operates within the existing 4.9 GHz band plan. We are also considering the alternative to maintain the status quo with the band plan to minimize economic impact on RF equipment manufacturers.

19. The Fifth FNPRM seeks comment on 4.9 GHz power limits for fixed operations,

directional antennas and higher antenna gains. Any changes to power and antenna gains may have significant economic impact on RF equipment manufacturers because the changes may necessitate redesign and Commission certification of radio equipment. While the Fifth FNPRM does not propose specific rules in this regard, we are cognizant that any new technical rule that is more restrictive than current rules could render some existing equipment non-compliant and thus obsolete and unuseable absent a grandfather provision. We are considering the alternative to maintain the status quo to minimize economic impact on RF equipment manufacturers. The proposal to require point-to-point links to use either horizontal or vertical polarization as appropriate may have significant economic impact on public safety licensees because polarized transmitting antennas may be more expensive than unpolarized transmitting antennas. We are considering the alternative to not require polarized antennas, but this alternative does not promote the most efficient use of spectrum.

20. The Fifth FNPRM seeks comment on allowing aeronautical mobile use by rule. We expect that the significant economic impact on applicants for aeronautical mobile operation would remain the same. Currently, applicants for aeronautical mobile operation must file waiver requests with the Commission, which carries an economic burden. Under the proposed rule, applicants for aeronautical mobile operation would no longer need to file waiver requests, but the rule would require applicants to describe their operation to demonstrate that it would protect radio astronomy observatories and 4.9 GHz terrestrial services from interference. The rule also would require applicants to certify that they have served copies of their applications to affected radio astronomy observatories. The economic burdens associated with these tasks may be comparable to the burdens associated with filing waiver requests. However, allowing aeronautical operation by rule would reduce the Commission's application processing time compared to processing waiver requests.

21. The Fifth FNPRM's questions on standards and emission masks would impose no significant economic impact on small entities at this time because the item proposes no restrictive rule changes in this regard.

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

22. None.

**STATEMENT OF
CHAIRMAN JULIUS GENACHOWSKI**

Re: *Amendment of Part 90 of the Commission's Rules, Implementing a Nationwide, Broadband, Interoperable Public Safety Network in the 700 MHz Band, Service Rules for the 698-746, 747-762 and 777-792 MHz Bands*, WP Docket No. 07-100, PS Docket No. 06-229, WT Docket No. 06-150, Fourth Report and Order and Fifth Further Notice of Proposed Rulemaking (June 13, 2012)

When an emergency hits, efficient, effective, state-of-the-art communications is critical. That's why one of our central missions has been enabling our nation's first responders to have the communications tools they need to do their jobs effectively.

So I'm pleased that we are acting today to modify and update the rules governing the 4.9GHz band to accelerate its use for public safety wireless broadband services. This will enable the public safety community to take full advantage of the band's significant potential.

The actions we are taking today are important for four basic reasons.

First, our action is designed to unlock the potential of 4.9 GHz for public safety use. This is a contiguous block of 50 megahertz of broadband spectrum dedicated to public safety and well-suited for both fixed and mobile uses over short distances.

The band hasn't met its full potential. Today's item puts us on a path to change that. The changes we are proposing have the potential to reinvigorate the band, to harness it for better and more efficient use, and bring it more fully into the overall thinking about public safety communications.

Second, our action today is designed to foster innovation and the development of exciting new communications technologies for public safety – like cutting-edge mobile, temporary mesh networks that can support data, voice, and video communications, networks that support remote real-time video monitoring in sensitive locations, and networks that support city-wide Wi-Fi networks to give first responders dedicated broadband access.

The gap between functionality of public safety communications devices and commercial communications devices is growing, so is the gap in price. We've heard from many in the public safety community that public safety too often gets less for more. We're committed to working with the public safety community to ensure that our first responders have communications devices that provide everything technology is capable of, while meeting first responders' unique needs. Our action in this band is one of several steps showing our commitment to innovation in public safety communications.

Third, our action today may enable mutually beneficial relationships between public safety and commercial users.

The primacy of public safety is protected, and there is more flexibility to strike sensible arrangements with commercial providers that provide multiple benefits.

Fourth, our action today is another step forward in our ongoing regulatory reform agenda – in this case, modifying or removing outdated or unnecessary rules to ensure spectrum is used as fully and efficiently as possible.

I would like to thank everyone in the Public Safety and Homeland Security Bureau, the Wireless Telecommunications Bureau and in the Office of Engineering and Technology for all their work on this item. I appreciate all their efforts and dedication.

**STATEMENT OF
COMMISSIONER ROBERT M. McDOWELL**

Re: *Amendment of Part 90 of the Commission's Rules, Implementing a Nationwide, Broadband, Interoperable Public Safety Network in the 700 MHz Band, Service Rules for the 698-746, 747-762 and 777-792 MHz Bands*, WP Docket No. 07-100, PS Docket No. 06-229, WT Docket No. 06-150, Fourth Report and Order and Fifth Further Notice of Proposed Rulemaking (June 13, 2012)

Fortunately or unfortunately, today's order and notice is an excellent example of what happens when policymakers, sometimes with the best of intentions, over-engineer spectrum allotments. I applaud Chairman Genachowski for attempting to right the ship to take us on a new course, and I am therefore pleased to support today's action.

To appreciate our action today, it is important to understand some of the historical context surrounding how we arrived here. Back in 2000, the Commission proposed to allocate the 4.9 GHz Band under Part 27 of the rules for fixed and mobile services with licenses assigned by competitive bidding.¹ At that time, the Commission specifically rejected the suggestion that the spectrum be set aside for public safety because Congress had recently allotted 24 megahertz in the 700 MHz Band for exclusive public safety use.²

In 2002, however, the Commission allocated the band for exclusive mobile use by public safety entities³ after hearing from "numerous state, county and local government and national public safety organizations representing a diverse group of critical public safety activities – law enforcement, fire fighting, SWAT/tactical team and bomb squad, hazardous materials handling, railroad passenger rescue and emergency medical operations."⁴ These entities "argued persuasively" that a public safety designation in the band would "enable responders to carry out critical and urgent missions in a way that ensures more effective and efficient service to their communities and provide a safer environment for emergency responders."⁵ They also explained that the band "could be used for short-range broadband wide area local networks ... for different operations at different locations in the same city, thus multiplying its utilization."⁶ Finally, they "consistently state[d] ... that the spectrum [would] be used primarily in emergency situations, and they need[ed] dedicated spectrum that [would] be reliably available *without delay*."⁷

So here we are ten years later. The Commission's staff informs us that only about 2,400 of the approximately 87,500 local governmental jurisdictions in the U.S. hold licenses in the 4.9 GHz Band.

¹ *The 4.9 GHz Band Transferred from Federal Government Use*, WT Docket No. 00-32, Notice of Proposed Rulemaking, 15 FCC Rcd 4778, 4786 ¶ 16 (2000).

² *Id.* at 4789-90 ¶¶ 25-26.

³ *The 4.9 GHz Band Transferred from Federal Government Use*, WT Docket No. 00-32, Second Report and order and Further Notice of Proposed Rulemaking, 3955, 3960-62 ¶¶ 8-11 (2002).

⁴ *Id.* at 3966-67 ¶ 23.

⁵ *Id.* ¶ 23.

⁶ *Id.*

⁷ *Id.* at 3969 ¶ 28 (emphasis added).

And, over the course of my tenure, many public safety representatives have suggested to me that this band is not suitable for advanced broadband communications they most need. In the meantime, I can't help but imagine what may have been had this spectrum been auctioned in 2002. There's no telling what kinds of innovative services may have developed in this band. We'll never know what could have been, but now we have an opportunity to make new dreams a reality.

Whatever the reason for the band's woeful underutilization, the good news is that today we are starting anew and seeking comment on fresh ideas for maximizing the utility of the 4.9 GHz Band. I look forward to engaging with my colleagues and interested parties and I hope that we will proceed mindful of the years we've lost. I am eager to put this spectrum into the hands of America's wireless consumers as quickly as possible.

Thank you to David Furth and the entire team in the Public Safety and Homeland Security Bureau for your thoughtful work on this matter.

**STATEMENT OF
COMMISSIONER MIGNON L. CLYBURN**

Re: Amendment of Part 90 of the Commission's Rules, WP Docket No. 07-100; Implementing a Nationwide, Broadband, Interoperable Public Safety Network in the 700 MHz Band, PS Docket No. 06-229; Service Rules for the 698-746, 747-762 and 777-792 MHz Bands, WT Docket No. 06-150

I commend the Public Safety and Homeland Security Bureau for presenting us with an item that contains recommendations to encourage greater deployment of fixed and mobile public safety services in the 4.9 GHz band. Ever since the National Broadband Plan's release, in March of 2010, one of the highest priorities for the Commission has been to find new ways to repurpose more spectrum for commercial mobile services. Since spectrum has become such a premium, when the Commission finds that a particular spectrum band is being underutilized, it is imperative that the agency encourages greater use of this precious resource. This is as true for spectrum allocated to public safety as it is for spectrum allocated for commercial services.

When the Commission first allocated 50 megahertz of spectrum in the 4.9 GHz band for fixed and mobile services, it intended to give the public safety community maximum access to emerging broadband technologies. The agency anticipated that this band would support new broadband applications such as high-speed digital technologies for scene management and dispatch operations. Unfortunately, the band has not led to the development of the advanced services the Commission originally anticipated. Local public safety entities have not taken advantage of this band as much we expected, and while there are currently more than 87,000 public safety jurisdictions, fewer than 3 percent hold licenses in the 4.9 GHz band.

I commend the staff for presenting a number of creative proposals that could encourage greater deployment of services for this band. These recommendations include: expanding eligibility to more than just public safety entities; adopting standards to promote interoperability of equipment in the band; and using the band for wireless backhaul services that could help the deployment of the nationwide public safety network. It is also important to note that the item seeks to address issues such as the need for better coordination among licensees that were raised in response to a Further Notice that the Commission released in 2009. I encourage all relevant stakeholders to participate in this proceeding.

I would like to thank David Turetsky, the new Chief of the Public Safety and Homeland Security Bureau, and his staff for presenting us with such a thorough discussion of the relevant technical issues.

**STATEMENT OF
COMMISSIONER JESSICA ROSENWORCEL**

Re: *Amendment of Part 90 of the Commission's Rules, Implementing a Nationwide, Broadband, Interoperable Public Safety Network in the 700 MHz Band, Service Rules for the 698-746, 747-762 and 777-792 MHz Bands*, WP Docket No. 07-100, PS Docket No. 06-229, WT Docket No. 06-150, Fourth Report and Order and Fifth Further Notice of Proposed Rulemaking (June 13, 2012)

In today's Order and Further Notice, the Commission looks for new ways to deliver advanced communications tools and unlock potential in the 4.9 GHz band. A decade ago, when the Commission allocated this band for fixed and mobile services in support of public safety, it envisioned that the spectrum could be used for a variety of new broadband applications, including wireless local area networks in emergencies, or public safety "hot spots."

But this has not come to pass. So this proceeding is an opportunity to reboot, reinvigorate, and remake possibilities in the 4.9 GHz band. While proposing to continue to use the band primarily for support of public safety, we also seek comment on expanding eligibility to permit use by the critical infrastructure industry and by commercial users under certain conditions. These additional users could provide scope and scale that would promote the development of equipment for use in the band.

I thank the Bureau for their efforts to ensure that our spectrum resources are used fairly and efficiently and I look forward to the record that develops.

**STATEMENT OF
COMMISSIONER AJIT V. PAI**

Re: Amendment of Part 90 of the Commission's Rules, Implementing a Nationwide, Broadband, Interoperable Public Safety Network in the 700 MHz Band, Service Rules for the 698-746, 747-762 and 777-792 MHz Bands, Fourth Report and Order and Fifth Further Notice of Proposed Rulemaking, WP Docket No. 07-100, PS Docket No. 06-229, WT Docket No. 06-150

This is my second opportunity in as many Commission meetings to vote on a proposal to improve the communications capabilities of our Nation's public safety professionals. As I said when we launched the examination of the potential use of Deployable Aerial Communications Architecture during emergencies, actions such as these fulfill our core purpose of "promoting safety of life and property through the use of wire and radio communications." 47 U.S.C. § 151. I once again commend the Public Safety & Homeland Security Bureau for its continued efforts to be responsive to the needs of public safety organizations and the citizens they protect. And I look forward to working with the new Bureau Chief, David Turetsky, on this and many other matters in the days to come.

This item focuses on promoting more effective and efficient use of 4.9 GHz spectrum allocated to public safety. It is one of the many necessary and incremental steps in the broader struggle to free up additional spectrum to meet our Nation's ever-growing demand for it.

The 4.9 GHz spectrum band was transferred from Federal Government to non-Federal Government use pursuant to statutory requirements of the Omnibus Budget Reconciliation Act of 1993.¹ It ultimately was designated by the Commission for public safety use in 2002.² At the time, the Commission believed that the allocation and designation would provide public safety with additional spectrum to support new broadband applications.³

However, a decade later, and notwithstanding Commission action in 2009 to further facilitate its use for public safety broadband,⁴ it is obvious that this spectrum remains underutilized. As a result, we are compelled to reevaluate our existing regulatory scheme and seek comment on new approaches to spur robust and efficient use of the band. The Order we adopt today clarifies and corrects certain technical rules and entries in the Public Safety Pool Frequency Table, and I hope it encourages increased use. But these measures should not overshadow the fact that today's 4.9 GHz inquiry is occasioned by the gap between expectations and results.

There are immediate lessons that we should take from this history. First and foremost, we should be reminded that even with the best intentions, time is not our ally in combating a spectrum shortage. It can take many years to bring spectrum into the marketplace. Thus, we should not – and, given increasing demand, cannot – focus solely on long-term solutions to the exclusion of short-term opportunities. To be sure, I will continue to press for the prompt implementation of the incentive auction authority Congress

¹ Pub. L. 103-66, 107 Stat. 312 (1993). *See also* The 4.9 GHz Band Transferred from Federal Government Use, WT Docket No. 00-32, *Second Report and Order and Further Notice of Proposed Rulemaking*, 17 FCC Rcd 3955, 3956 (2002) (*Second Report and Order*).

² *See Second Report and Order*, 17 FCC Rcd at 3956.

³ *Id.*

⁴ *See* Amendment of Part 90 of the Commission's Rules, WP Docket No. 07-100, *Report and Order and Further Notice of Proposed Rulemaking*, 24 FCC Rcd 4298 (2009).

recently granted us. And I will continue to urge the federal government to accelerate its efforts to free up as much additional spectrum as is feasible. But I also believe we must not neglect viable, immediate options on spectrum policy. In particular, the Commission must quickly review secondary-market transactions that will put spectrum in the hands of those who will put it to higher-value use. Right now, many of these transactions take too long for the Commission to review. We also must be vigilant in our efforts to ensure that our rules remain current in the face of rapid technological innovation.

Today's Notice of Proposed Rulemaking illustrates how we can update our rules to realize the benefits of current technology and remove barriers to the efficient use of spectrum. Among other things, we seek comment on adjustments to the existing 4.9 GHz technical rules that may result in increased spectrum efficiency and throughput while maintaining safeguards to avoid interference. We solicit views on our tentative conclusion that expanding eligibility for commercial use on a secondary basis would incent investment and promote greater use of the band. We inquire whether critical infrastructure industry entities should be eligible to hold 4.9 GHz licenses on a primary basis, thus removing the requirement for a sharing agreement under the current rules. We explore alternative licensing schemes as yet another way to expand use of the band. Finally, we examine whether we should lift the general prohibition on aeronautical mobile operations in the band and permit such operation on a secondary, non-interference basis to 4.9 GHz terrestrial services subject to certain conditions and requirements.

I look forward to reviewing a robust record on these and other issues raised in the NPRM. After too long a journey, it is my hope that this proceeding will put us on a path that will enable more efficient use of this spectrum for the benefit of all Americans.