

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

ORDER ON RECONSIDERATION AND
EIGHTH FURTHER NOTICE OF PROPOSED RULEMAKING

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separate statements; Commissioner Carr concurring in part, approving in part and issuing a statement.

TABLE OF CONTENTS

Heading Paragraph #
I. INTRODUCTION.....1
II. BACKGROUND.....5
A. 4.9 GHz Band Rules5
B. State of the 4.9 GHz Band8
C. Procedural History10
III. ORDER ON RECONSIDERATION16
IV. EIGHTH FURTHER NOTICE OF PROPOSED RULEMAKING27
A. Overview27
B. Ensuring Public Safety Use of the Band.....29
1. Protection for Public Safety Licensees.....30
2. Licensing Database.....32
3. Interoperability37
4. Public Safety Priority and Preemption39
C. Fostering Greater Public Safety Use of the Band44
1. Frequency Coordination45
2. Nationwide Band Manager.....51
3. Regional Planning Committees54
4. Incentivizing Use of Latest Commercially Available Technologies.....57
5. Other Technical Options.....60
D. Facilitating Non-Public Safety Access to the Band.....61
1. Shared Access Models.....66
a. Excess Capacity Leasing.....67
b. Spectrum Access System (SAS) Managed Shared Access.....69
c. Manual and Technical Sharing75
2. Licensing Non-Public Safety Operations77
a. Non-Exclusive Licensed Access.....78
b. Granting Exclusive Use Licenses79
c. Unlicensed Access86

3. Other Considerations	87
V. PROCEDURAL MATTERS	90
VI. ORDERING CLAUSES	98
Appendix A – Final Rules	
Appendix B – Final Regulatory Flexibility Analysis	
Appendix C – Initial Regulatory Flexibility Analysis	

I. INTRODUCTION

1. In 2002, the Commission designated fifty (50) megahertz of spectrum at 4.9 GHz (4940-4990 MHz) for public safety use.¹ Operations in the band are limited to those in support of public safety operations² and licenses for the band are exclusively available to public safety entities or those operating in support of public safety.³ Since the designation of the band, the Commission has re-examined, sought comment on, and amended its rules in response to changing conditions. In these endeavors, the Commission has sought to increase the use of the band with the goal of maximizing the potential of this spectrum.⁴

2. With this *Order on Reconsideration and Eighth Further Notice of Proposed Rulemaking*, we revisit the most recent effort at remaking the band and chart a new course in the future of the 4.9 GHz band that we believe will more effectively advance these aims. Rather than risking a fragmented approach, which could undermine efforts to promote public safety use of the band, we delete rules which we previously stayed and which we now conclude, after review of the petitions for reconsideration, are not in the public interest. We then seek comment on how to advance the Commission’s original goal to ensure “public safety enjoys maximum access to emerging broadband technologies”⁵ while also increasing overall use of the band through a single, nationwide framework that protects and fosters the growth of, and innovation in, critical operations.

3. As part of an effort to increase use of the band, last year the Commission adopted its *Sixth Report and Order*⁶ in this proceeding, which empowered individual states with the authority to make decisions about how to use the 4.9 GHz band within their jurisdictions.⁷ Under these rules, states could continue to use the spectrum for public safety operations, or they could lease the spectrum to a commercial service provider or other third party for non-public-safety use. Public safety organizations filed petitions for reconsideration of those rules arguing that they undermine, and could effectively

¹ 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 Rulemaking, 17 FCC Rcd 3955 (2002) (*Second Report and Order*).

² 47 CFR § 90.1203(b).

³ 47 CFR § 90.1203(a).

⁴ The Commission has also received extensive input from public safety organizations such as the Association of Public-Safety Communications Officials-International, Inc. (APCO) and the National Public Safety Telecommunications Council (NPSTC). See, e.g., APCO International, 4.9 GHz Task Force Report (2015), <https://ecfsapi.fcc.gov/file/60001325364.pdf>, (APCO Sept. 28, 2015 Report); NPSTC, 4.9 GHz National Plan Recommendations Final Report (2013), https://npstc.org/download.jsp?tableId=37&column=217&id=3222&file=4_9_GHz_National_Plan_Report_131024.pdf, (NPSTC Oct. 24, 2013 Plan).

⁵ *Second Report and Order*, 17 FCC Rcd at 3956, para. 1.

⁶ *Amendment of Part 90 of the Commission’s Rules*, WP Docket No. 07-100, Sixth Report and Order and Seventh Further Notice of Proposed Rulemaking, 36 FCC Rcd 1958 (2020) (*Sixth Report and Order* or *Seventh Further Notice*).

⁷ *Sixth Report and Order*, 36 FCC Rcd at 1959, para. 2.

eliminate, public safety access to the band.⁸ This *Order on Reconsideration* grants the Petitions insofar as they sought deletion of the rules adopted in the *Sixth Report and Order*.⁹ We agree that the framework, which allows State Lessors to use and lease the band for non-public safety purposes, is not in the public interest, and that the public interest would be better-served by considering other models. We also lift, in part, the licensing freeze adopted in advance of the *Sixth Report and Order*, thereby allowing incumbents to modify their existing licenses or to license new permanent fixed sites.

4. The accompanying *Eighth Further Notice of Proposed Rulemaking (Eighth Further Notice)* represents a comprehensive effort to establish a forward-looking nationwide framework for the 4.9 GHz band. The *Eighth Further Notice* seeks comment on important technical details and key policy questions to maximize the use of the band to support public safety, leverage technological advancements (such as 5G), foster a robust equipment market, and address non-public safety use of the band. Many of the issues raised in the *Eighth Further Notice* reflect input from public safety stakeholders in response to prior Commission proposals in this proceeding. Drawing on this prior feedback, we seek comment on several alternatives to promote innovation, stimulate investment, and facilitate robust public safety access in the 4.9 GHz band. We believe that by implementing a nationwide framework that reflects public safety input, our approach “will promote more opportunistic use of the 4.9 GHz band without compromising the integrity and security of public safety operations.”¹⁰

II. BACKGROUND

A. 4.9 GHz Band Rules

5. Under our rules, to be eligible for a 4.9 GHz license, an entity must provide public safety services.¹¹ This includes state and local government entities,¹² as well as nongovernmental organizations (NGOs), that operate their systems solely to transmit communications essential to the provision of services having the sole or principal purpose of protecting the safety of life, health or property.¹³ In 2020,

⁸ Petition for Reconsideration of the Public Safety Spectrum Alliance, WP Docket No. 07-100, at 2, 12-13 (filed Dec. 29, 2020), https://ecfsapi.fcc.gov/file/1229129648687/PSSA-PetitionForReconsideration_4.9GHz_Dec292020-FINAL.pdf (noting that the state-by-state approach fails to guarantee “nationwide access to the Band on a fully interoperable basis”) (PSSA Dec. 29, 2020 Petition); Petition for Reconsideration of APCO International, WP Docket No. 07-100, at 3-4 (filed Dec. 30, 2020), <https://ecfsapi.fcc.gov/file/12292482323692/APCO%20Petition%20for%20Reconsideration%20-%204.9%20GHz%20-%20Dec%202020.pdf> (stating that “the new approach essentially permits states to lease spectrum to the highest bidder, which in effect creates state-by-state private auctions that will lack the economies of scale and consistency of a single, national-level approach”) (APCO Dec 30, 2020 Petition); Petition for Reconsideration By the National Public Safety Telecommunications Council, WP Docket No. 07-100, at 8 (filed Dec. 30, 2020), https://ecfsapi.fcc.gov/file/1230119184650/NPSTC_Petition_for_Recon_6th_RandO_4.9GHz_12.30.2020%20FIN_AL.pdf (“Incumbent system expansion must be through a lease with the state, which awaits the time it will take states to establish this new and unchartered approach”) (NPSTC Dec. 30, 2020 Petition). Petitioners also argued that the Commission’s actions in the *Sixth Report and Order* suffered from procedural defects related to the notice and comment requirements of the Administrative Procedures Act (APA). PSSA Dec. 29, 2020 Petition at 3-10; APCO Dec 30, 2020 Petition at 2; NPSTC Dec. 30, 2020 Petition at 6-8.

⁹ Because we grant the Petitions on the basis of substantive arguments, we do not address their procedural arguments as to the Commission’s compliance with the APA.

¹⁰ *Amendment of Part 90 of the Commission’s Rules*, WP Docket No. 07-100, Sixth Further Notice of Proposed Rulemaking, 33 FCC Rcd 3261, 3262, para. 3 (2018) (*Sixth Further Notice*).

¹¹ 47 CFR § 90.1203(a) (referring to 47 CFR § 90.523).

¹² *Id.* § 90.523(a).

¹³ *Id.* § 90.523(b). In addition, to establish eligibility, an NGO must also secure and maintain the support for the right to operate its system from a state or local governmental entity whose mission is to oversee or provide services

(continued....)

however, the Commission adopted the State Lessor framework, which created an exception to the requirement that operations in the band be used only in support of public safety.¹⁴ In addition to the leasing rules, licensees are also permitted to enter into sharing agreements with ineligible entities for use of this spectrum, but operations must be in support of public safety.¹⁵

6. A key component of the 4.9 GHz band is that licenses are granted for shared use amongst public safety entities only and do not convey a right to exclusive, or interference free, access to the band.¹⁶ 4.9 GHz band licenses authorize operation on any channel over the entire 50 megahertz of the band and are issued for the geographic area encompassing the legal jurisdiction of the licensee.¹⁷ Public safety entities can also be licensed for fixed point-to-point (P-P) and point-to-multipoint (P-MP) operations on specific channels within their jurisdictions.¹⁸ As a result, licenses often overlap: there may be one or more geographic area license covering a given location and licensed on the same spectrum, as well as multiple fixed-site licenses in the same area.¹⁹ This structure was established for the band based on public safety agencies' unique history of coordination with one another in the use of shared frequencies,²⁰ however, our 4.9 GHz rules do not specify a formal coordination requirement.²¹

7. Licensees are also permitted to operate base stations with mobile units and temporary fixed stations outside their authorized area with the permission of the other jurisdiction in which they will operate.²² Permanent fixed P-P and P-MP stations must be licensed individually on a site-by-site basis.²³ Permanent fixed stations that connect base and mobile stations that are used to deliver broadband, or that are part of a public safety network using spectrum designated for broadband use, are accorded "primary" status under the rules.²⁴

B. State of the 4.9 GHz Band

8. All licenses in this band are limited to operations within their state or local jurisdictions,

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that have the sole or principal purpose of protecting the safety of life, health or property, and the NGO must provide a written certification of such support in any submitted application. *Id.*

¹⁴ *Id.* § 90.1203(b)-(c).

¹⁵ *Id.* § 90.1203(b).

¹⁶ *Id.* § 90.1209(a).

¹⁷ *Id.* § 90.1207(a). In the case of a NGO, the license is issued for the legal jurisdiction of the state or local government entity supporting the NGO. *Id.* Some licenses are issued for only part of a licensee's jurisdiction, for example, an area defined by a point and a specified radius of operation.

¹⁸ Some P-P or P-MP systems receive primary status because of the broadband nature of the traffic carried. *Id.* § 90.1207(d).

¹⁹ For example, a common scenario might involve a statewide license held by the state police, a county-wide license held by the sheriff's department, and fixed-site licenses operating in the same area by various public safety entities. Licensees informally cooperate with one another to ensure that their operations do not cause interference with one another, and to resolve interference if it occurs.

²⁰ *The 4.9 GHz Band Transferred from Federal Government Use*, Memorandum Opinion and Order and Third Report and Order, 18 FCC Rcd 9152, 9164, para. 28 (2003) ("We note that many public safety agencies already have procedures or protocols in place with nearby jurisdictions to govern frequency sharing during situations requiring joint operations." The Commission also explained that "the nature of public safety operations in general will . . . facilitate this sharing requirement.") (*4.9 GHz Third Report and Order*).

²¹ 47 CFR §§ 90.175(j)(22), 90.1209(b).

²² *Id.* § 90.1207(c).

²³ *Id.* § 90.1207(d).

²⁴ *Id.*

or that of the entity supporting the application of an NGO, regardless of the area specified on the license (which, due to legacy Universal Licensing System limitations, in some cases is depicted as larger than the relevant jurisdiction).²⁵ A licensee has the authority to operate base stations and mobile units (including portables and handheld units) and/or temporary (one year or less) fixed stations anywhere within its authorized area.²⁶

9. There are 3,541 licenses currently issued in the band.²⁷ This includes 137 statewide area licenses, 1,145 countywide area licenses, and 2,259 other licenses, either for geographic area licenses or other types (such as for a group of counties, a city, or parts of one or more cities) or for fixed sites.²⁸ Most of the United States and U.S. territories are covered by at least one statewide license.²⁹ In some states, multiple state entities hold statewide licenses.³⁰ Operations, particularly fixed communications and connectivity, are used to facilitate video streaming, communications system backhaul, and data connections for advanced devices.³¹ Commenters have suggested that emerging and potential uses of the band may include robotics and airborne operations, as well as Internet of Things.³²

C. Procedural History

10. *Freeze Public Notice.* On September 8, 2020, in an effort to stabilize the band while the Commission considers changes to the rules as part of this proceeding, the Public Safety and Homeland Security Bureau (PSHSB) and the Wireless Telecommunications Bureau (WTB) (collectively the Bureaus) announced a freeze on applications in the 4.9 GHz band.³³ Pursuant to the *Freeze Public Notice*, the Bureaus are not accepting applications for new or modified licenses, including both geographic area licenses and individual fixed-site licenses.³⁴

²⁵ 47 CFR § 90.1207. Nearly all licenses also contain a condition specifying this limitation.

²⁶ *Id.* § 90.1207(b).

²⁷ Federal Communications Commission, Universal Licensing System, <https://wireless2.fcc.gov/UlsApp/UlsSearch/searchLicense.jsp> (last visited September 13, 2021).

²⁸ For example, Southwestern NH District Fire Mutual Aid holds a license, call sign WQNM520, covering three counties in New Hampshire.

²⁹ The following states/territories are not covered by a statewide license: American Samoa, Georgia, Iowa, Kansas, the Northern Mariana Islands, and South Dakota.

³⁰ For example, the State of Maryland holds a statewide 4.9 GHz band license (WPYX998), as do four other agencies of the Maryland state government (Maryland State Highway Administration – WQAN291; Maryland Department of Information Technology – WPYZ305; Maryland DNR – WPYT728; Maryland MIEMSS – WQAL856).

³¹ *Sixth Report and Order*, 36 FCC Rcd at 1961, para. 8.

³² *Id.*; see also Letter from Ralph A. Haller, Chairman, National Public Safety Telecommunications Council, to Marlene H. Dortch, Secretary, FCC, WP Docket No. 07-100, at 3 (filed Aug. 13, 2021) (NPSTC Aug. 13, 2021 *Ex Parte*) (“The NPSTC recommendations incorporate provisions for new public safety operations that advances in robotics, the internet of things (IoT) and unmanned aerial systems technologies are generating.”). While Commission rule, section 90.1205(c), 47 CFR § 90.1205(c), currently prohibits aeronautical mobile operations, some operations have been authorized through rule waiver. See, e.g., City of Long Beach, California, call sign WQJE424.

³³ *Public Safety and Homeland Security Bureau and Wireless Telecommunications Bureau Announce Temporary Filing Freeze on the Acceptance and Processing of Certain Part 90 Applications for the 4940-4990 MHz Band*, WP Docket No. 07-100, Public Notice, 35 FCC Rcd 9522 (PSHSB/WTB 2020) (*Freeze Public Notice*). The *Freeze Public Notice* also noted that any 4.9 GHz licensee could seek relief from the freeze through the Commission’s waiver provisions.

³⁴ *Freeze Public Notice*, 35 FCC Rcd 9522.

11. *Sixth Report and Order and Seventh Further Notice.* On September 30, 2020, the Commission adopted the *Sixth Report and Order and Seventh Further Notice* in this proceeding.³⁵ The new leasing framework adopted in the *Sixth Report and Order* granted states, through a single statewide entity designated as the State Lessor, the option to lease spectrum access to state and local entities—whether public safety or non-public safety—as well as to commercial and other private entities in their jurisdictions.³⁶ State Lessors were also permitted to use the band for non-public safety purposes themselves.³⁷

12. In the *Seventh Further Notice*, the Commission proposed an expansion of the new state-based framework to include public safety operations. It proposed to grandfather licenses that were in effect at the time of the *Freeze Public Notice* and those granted pursuant to waiver or modification of the freeze, but otherwise proposed to centralize authority within each state by giving the State Lessor (or some other statewide licensee entity) the authority to coordinate public safety operations at both the state and local levels, in addition to its existing authority as a coordinator of that state’s non-public safety operations.³⁸ The Commission also proposed to amend its 4.9 GHz licensing rules to limit future licensing to state entities seeking a statewide license in states without an existing statewide license for purposes of this coordination.³⁹ In addition, the Commission sought comment on ways to maximize opportunities for states to voluntarily facilitate more efficient 4.9 GHz band operations.⁴⁰

13. *Petitions for Reconsideration.* On December 30, 2020, the Public Safety Spectrum Alliance (PSSA),⁴¹ APCO International (APCO),⁴² and the National Public Safety Telecommunications Council (NPSTC, and with PSSA and APCO, the Petitioners)⁴³ filed petitions for reconsideration of the *Sixth Report and Order* (the Petitions). The Petitions raise concerns that the new leasing framework adopted in the *Sixth Report and Order* fails to provide for protection of current and future public safety use of the band.⁴⁴ Because of these concerns, Petitioners ask that the Commission vacate the *Sixth Report and Order and Seventh Further Notice*.⁴⁵

³⁵ *Sixth Report and Order*, 36 FCC Rcd at 1959.

³⁶ *Sixth Report and Order*, 36 FCC Rcd at 1959, para. 2. The Commission only permitted states that are not identified in the Commission’s December 2019 911 Fee Report as diverting 911 fees for non-911 purposes to lease spectrum rights to non-public safety or public safety entities. *Id.* at 1967-68, paras. 23-24. *See also* FCC, Eleventh Annual Report to Congress on State Collection and Distribution of 911 and Enhanced 911 Fees and Charges at 39, para. 27 (2019), <https://www.fcc.gov/files/11thannual911feereport2019pdf>.

³⁷ *Sixth Report and Order*, 36 FCC Rcd at 1971-72, paras. 35-36.

³⁸ *Seventh Further Notice*, 36 FCC Rcd at 1977-78, paras. 48-50.

³⁹ *Seventh Further Notice*, 36 FCC Rcd at 1978-82, paras. 51-60.

⁴⁰ *Seventh Further Notice*, 36 FCC Rcd at 1982-85, paras. 61-73.

⁴¹ PSSA Dec. 29, 2020 Petition.

⁴² APCO Dec 30, 2020 Petition.

⁴³ NPSTC Dec. 30, 2020 Petition.

⁴⁴ *See* PSSA Dec. 29, 2020 Petition; NPSTC Dec. 30, 2020 Petition; APCO Dec 30, 2020 Petition. The Petitions further allege that the *Sixth Report and Order* is arbitrary and capricious because it lacks a basis in the record compiled in this proceeding. PSSA Dec. 29, 2020 Petition at 6-8; APCO Dec 30, 2020 Petition at 2-7. More specifically, the Petitions argue that the Commission failed to provide adequate notice and comment where the Commission ceded spectrum management authority to state governments, excluded states that divert 911 fees from leasing, and failed to promote the public safety use of the band by taking the band away from exclusive public safety use. PSSA Dec. 29, 2020 Petition at 3-6, 6 n.18, 6-20; NPSTC Dec. 30, 2020 Petition at 4-8; APCO Dec 30, 2020 Petition at 2-7.

⁴⁵ PSSA Dec. 29, 2020 Petition at 20; NPSTC Dec. 30, 2020 Petition at 9; APCO Dec 30, 2020 Petition at 7-8.

14. On January 12, 2021, the Bureaus sought comment on the Petitions.⁴⁶ One comment was filed in support of the Petitions.⁴⁷ No party opposed the Petitions.

15. *Stay Order.* On May 27, 2021, the Commission granted PSSA's Petition for Stay⁴⁸ of the *Sixth Report and Order*.⁴⁹ Pursuant to the *Stay Order*, the Commission stayed the implementation of the new leasing framework adopted in the *Sixth Report and Order* for the 4.9 GHz band, which had not yet become effective, pending a Commission decision on the petitions for reconsideration filed in this proceeding.⁵⁰ Because the *Stay Order* was adopted before the State Lessor framework went into effect, the entire framework adopted in the *Sixth Report and Order* has remained pending and no leasing or non-public safety use has been authorized.

III. ORDER ON RECONSIDERATION

16. *Standard of Review.* Any interested party may file a petition for reconsideration of a final action in a rulemaking proceeding.⁵¹ Reconsideration “may be appropriate when the petitioner demonstrates that the original order contains a material error or omission, or raises additional facts that were not known or did not exist until after the petitioner’s last opportunity to present such matters.”⁵² The Commission may consider facts or arguments not previously presented if “[t]he Commission determines that consideration of the facts or arguments relied on is required in the public interest.”⁵³ The Commission may grant the petition for reconsideration in whole or in part or may deny or dismiss the petition.⁵⁴

17. *Discussion.* Upon review of the record, in particular the Petitions, we agree with Petitioners that the decision in the *Sixth Report and Order* to adopt the State Lessor framework was not in the public interest. Petitioners have now provided the Commission with additional information regarding the impact of the framework on public safety access to the band, in particular on their concerns about the fragmentation of the band on a state-by-state basis.⁵⁵ As explained below, Petitioners have demonstrated that the adoption of the State Lessor framework lacks sufficient safeguards to protect public safety access

⁴⁶ See *Petitions for Reconsideration of Action in Proceeding*, WP Docket No. 07-100, Public Notice, Report No. 3167 (2021).

⁴⁷ The International Association of Fire Chiefs Support of Petitions for Reconsideration by the National Public Safety Telecommunications Council and the Public Safety Spectrum Alliance, WP Docket No. 07-100 (rec. March 8, 2021) (IAFC March 8, 2021 Comment).

⁴⁸ Petition for Stay, Public Safety Spectrum Alliance, WP Docket No. 07-100 (filed Dec. 29, 2020), https://ecfsapi.fcc.gov/file/1229024403423/PSSA-Petition%20for%20Stay_4.9Ghz_Dec292020%20-%20FINAL.pdf (PSSA Stay Petition).

⁴⁹ *Amendment of Part 90 of the Commission's Rules*, WP Docket No. 07-100, Order, FCC 21-66 (May 27, 2021) (*Stay Order*).

⁵⁰ *Stay Order*, at 2-4, paras. 5-11; see also PSSA Dec. 29, 2020 Petition; NPSTC Dec. 30, 2020 Petition; NPSTC Dec. 30, 2020 Petition.

⁵¹ 47 CFR § 1.429(a).

⁵² *Universal Service Contribution Methodology et al.*, WC Docket No. 06-122, et al., Order on Reconsideration, 27 FCC Rcd 898, 901, para. 8 (2012). 47 CFR § 1.429(b).

⁵³ 47 CFR § 1.429(b)(3).

⁵⁴ *Id.* § 1.429(i).

⁵⁵ *Id.* § 1.429(b)(3) (allowing review of an issue by the Commission when it serves the public interest); see also *Procedures to Govern the Use of Satellite Earth Station on Board Vessels in the 5925-6425 MHz/3700-4200 MHz Bands and 14.0-14.5GHz/11.7-12.2 GHz Bands*, IB Docket No. 02-10, Order on Reconsideration, 24 FCC Rcd 10369, 10373-74, para. 10 (2009) (reviewing a petitioner's request where the record had not included sufficient information and the petitioner, in its petition for reconsideration, provided information demonstrating why the request is within the public interest).

nationwide, and that the *Sixth Report and Order* failed to ensure that State Lessors, public safety licensees, and lessees would have a clear set of rules governing access to the band.⁵⁶

18. We therefore grant the Petitions insofar as they seek deletion of the rules adopted in the *Sixth Report and Order*. In doing so, we eliminate the State Lessor designation and the powers granted to State Lessors both to use their 4.9 GHz band spectrum rights for non-public safety operations and to lease some of those spectrum rights to third-parties for non-public safety purposes.⁵⁷ At the same time, as discussed in the *Eighth Further Notice* below, we continue to work towards achieving the Commission's consistent goal throughout this proceeding: increasing use of and investment in the 4.9 GHz band.

19. We reach this decision today because, upon review of the Petitions, we agree with Petitioners' concerns that a state-by-state leasing framework will not effectively protect public safety operations or maximize use of the band as effectively as a single, nationwide approach to the band.⁵⁸ A state-by-state framework would have resulted in a patchwork of different rules, processes, and terms governing the use of the spectrum which would undermine these important goals. We believe a clear set of nationwide rules is needed to ensure cross-jurisdictional compatibility, predictability of access, and a single equipment market to bring down costs.

20. While the Commission noted in the *Sixth Report and Order* that States were free to establish priority and preemption rules to protect public safety operations from interference from other uses of the band, the Commission did not establish any such rules itself.⁵⁹ We believe, based on further review of the record and of the facts and arguments raised by the Petitioners, that the Commission should consider any such protections on a nationwide basis and as part of a larger discussion on permitting non-public safety use of the band, rather than risk allowing a patchwork of separate and possibly incompatible spectrum access schemes to develop on a state-by-state basis. Thus, we vacate the *Sixth Report and Order* and delete the rules as adopted therein. The following discussion explains the reasons for this decision.

21. First, we agree with Petitioners that the lack of a single set of nationwide rules governing the introduction of non-public safety operations in the band—particularly vis-a-vis priority, preemption, or interference protection for public safety—risks confusion within the public safety community and undermines the informal coordination model on which the band currently relies.⁶⁰ The model relies on public safety licensees working together to ensure access without causing harmful interference, which

⁵⁶ In its petition, APCO points out that the Commission received “no comments addressing” certain issues “in the context of the adopted leasing regime. APCO Dec 30, 2020 Petition at 4 (citing *Sixth Report and Order*, 36 FCC Rcd at 1976, para. 46).

⁵⁷ *Sixth Report and Order*, 36 FCC Rcd at 1966-67, 71-72, paras. 20-22, 35-36.

⁵⁸ PSSA Dec. 29, 2020 Petition at 2, 12-13 (noting that the state-by-state approach fails to guarantee “nationwide access to the Band on a fully interoperable basis”); NPSTC Dec. 30, 2020 Petition at 8 (“Incumbent system expansion must be through a lease with the state, which awaits the time it will take states to establish this new and unchartered approach”); APCO Dec 30, 2020 Petition at 3-4 (stating that “the new approach essentially permits states to lease spectrum to the highest bidder, which in effect creates state-by-state private auctions that will lack the economies of scale and consistency of a single, national-level approach”).

⁵⁹ *Sixth Report and Order*, 36 FCC Rcd at 1976, para. 46.

⁶⁰ PSSA Dec. 29, 2020 Petition at 2, 11 (arguing that the framework “fails to ensure public safety use of the band will be accomplished with preemption and without interference to enable true mission critical services”); APCO Dec 30, 2020 Petition at 4-5 (asserting that the Commission departed from its goal of ensuring public safety has priority when it did not place any leasing restrictions on entity or service type); NPSTC Dec. 30, 2020 Petition at 8-9 (arguing that placing no restrictions on use types, failing to grant public safety priority, and failing to address specific interference protection fails to meet the Commission's goals concerning public safety priority and interference protection).

depends on a close alignment of licensees' incentives and goals.⁶¹ The absence of formal protection measures, as well as permitting the intermingling of public safety and non-public safety users on a co-primary basis, without appropriate protections for public safety users, would diminish incentives for full and open cooperation.⁶² In addition, Petitioners criticize the absence of clear safeguards as contrary to the public interest because it could place the protection of the public at risk.⁶³ Petitioners persuasively argue that this creates a risk that some operators, whether licensees or lessees, may undermine others' access to the band, whether within or between jurisdictions, and that coordination and protection methods are necessary to safely enable non-public safety access.⁶⁴

22. Second, the State Lessor framework would encourage the development of a state-by-state patchwork of possibly incompatible regulatory regimes going into effect on different timelines. This would undermine two of the stated goals of this proceeding: driving down equipment costs⁶⁵ and increasing equipment innovation.⁶⁶ We believe that the absence of nationwide technical rules may not only inhibit future progress on these efforts, but may actually cause regression on any progress that we have achieved in this area.⁶⁷ While introducing non-public safety operations into the band has the potential to increase demand for equipment, reducing costs and driving innovation, any such benefits gained would be minimal at best since manufacturers would incur significant costs developing equipment designed to meet different (and possibly inconsistent) standards and requirements that would arise as different States undertook disparate efforts to control harmful interference.⁶⁸ As Petitioners point out, the State Lessor framework—where decisions driving technical operations would be balkanized across the different states and territories—and the introduction of confusion surrounding the band's rules (and timelines for implementation thereof) would undermine certainty and predictability, thereby reducing incentives to invest in the band, hindering the development and deployment of new technologies, and increasing the risks of incompatible operations.⁶⁹ Instead, as reflected in the *Eighth Further Notice*

⁶¹ See 47 CFR § 90.1209(b) (requiring licensees to “cooperate in the selection and use of channels” through cooperation and “mutually satisfactory arrangements.”); PSSA Dec. 29, 2020 Petition at 16; APCO Dec 30, 2020 Petition at 5 (“Changing the spectrum environment could render the band unfit for supporting existing public safety use”); NPSTC Dec. 30, 2020 Petition at 3-4 (stating that placing the management of the band with each state will potentially lead to usage by certain entities that could be incompatible with incumbent operations).

⁶² PSSA Dec. 29, 2020 Petition at 9-11 (arguing that the lack of guidance to states on leasing requirements could potentially create the wrong incentive, especially “during these difficult economic times for most state budgets”, in how the spectrum is utilized); NPSTC Dec. 30, 2020 Petition at 6 (asserting that public safety entities are not protected since states are able to use discretion when leasing); APCO Dec 30, 2020 Petition at 4-5 (“State governments will thus be able to forego public safety use of the band in favor of increased revenue under the pretext of ‘balanc[ing] the needs of public safety’ and the benefits that can come from non-public safety use.”).

⁶³ PSSA Dec. 29, 2020 Petition at 5, 10 (asserting that the lack of clear safeguards regarding the leasing framework creates no guarantee that public safety “would retain the ability to leverage the Band for future mission critical services”).

⁶⁴ PSSA Dec. 29, 2020 Petition at 15-16; APCO Dec 30, 2020 Petition at 4-5; NPSTC Dec. 30, 2020 Petition at 3-4.

⁶⁵ *Sixth Report and Order*, 36 FCC Rcd at 1964, para. 16.

⁶⁶ *Id.* at 1974, para. 41.

⁶⁷ PSSA Dec. 29, 2020 Petition at 12 (citing to comments from then-Commissioner Rosenworcel on the fragmentation of the equipment market as a result of a state-by-state framework).

⁶⁸ PSSA Dec. 29, 2020 Petition at 12-15, 20; APCO Dec 30, 2020 Petition at 5-6; NPSTC Dec. 30, 2020 Petition at 6.

⁶⁹ PSSA Dec. 29, 2020 Petition at 12-13; APCO Dec 30, 2020 Petition at 5-6 (asserting that there is “little reason to expect cohesive, widespread investment” which will make it “difficult for public safety entities, CII, and wireless service providers to plan or invest in the band”); NPSTC Dec. 30, 2020 Petition at 5 (arguing that the time that it will take to establish this “new and unchartered approach” could take months which will likely hinder incumbent system expansion).

below, we will continue our efforts to increase use of this band, potentially widen the scope of eligibility for band access, reduce equipment costs, and ensure greater innovation through a clear set of nationwide rules which will foster robust and efficient spectrum use.

23. Finally, Petitioners rightly note that a single set of nationwide rules governing public safety spectrum is critically important to ensure that equipment can be used collaboratively by different agencies during emergency situations.⁷⁰ This was one of the major reasons why Congress directed the creation of the First Responder Network Authority (FirstNet),⁷¹ a nationwide public safety network in the 700 MHz Band, and the logic driving that effort applies here as well—when all agencies use compatible equipment subject to the same rules, they can work together more easily when the need arises.⁷² This is particularly important if non-public safety users are permitted to begin operating in the band. For example, during an emergency response that requires coordination among first responders from multiple states (e.g., Virginia and Maryland), the use of 4.9 GHz band equipment is governed by the same rules and the spectral environment in the 4.9 GHz band is fundamentally the same regardless of where the operations take place. However, under the State Lessor framework, the ability of agencies to use life-saving 4.9 GHz band equipment may be undermined if the rules governing the 4.9 GHz band in the jurisdiction where the equipment is normally used are incompatible with the rules in the jurisdiction where the equipment is needed. This could limit life-saving efforts in an emergency, which Petitioners rightly note is not in the public interest.⁷³

24. The Commission remains committed to increasing use of this band and to decreasing equipment costs and encouraging greater innovation, as reflected in the *Eighth Further Notice* below. In doing so, we recognize that this spectrum hosts important public safety uses. Protecting these uses requires a regulatory regime that is clear, predictable, and nationwide. We agree with Petitioners that the State Lessor framework put in place by the *Sixth Report and Order*, without additional protections and rules to ensure that State Lessors protect public safety priority and continued access, has the potential to undermine rather than achieve that goal. We therefore grant the Petitions insofar as they seek repeal of the State Lessor framework and delete the rules adopted in the *Sixth Report and Order* from our rules.

25. *Modification of the 4.9 GHz Band Freeze.* We also lift the licensing freeze currently in place for the 4.9 GHz band as it applies to incumbents wishing to modify their existing licenses or license new permanent fixed sites. Pursuant to the Bureau's September 8, 2020 *Freeze Public Notice*, no new or modified applications for 4.9 GHz band licenses are currently being accepted or processed.⁷⁴ In order to facilitate effective use of the band pending resolution of the issues raised below in the accompanying *Eighth Further Notice*, we amend the freeze to allow those with existing 4.9 GHz licenses to modify those

⁷⁰ PSSA Dec. 29, 2020 Petition at 12-13 (describing the importance of interoperable equipment that works nationwide); IAFC March 8, 2021 Comment at 2-3 (agreeing with PSSA's assertion that the new framework leads to an "absence of a national framework to manage this spectrum and provide cross border interoperability").

⁷¹ See Middle Class Tax Relief and Job Creation Act of 2012, Pub. L. No. 112-96, 126 Stat. 156 §§ 6001-6303, 6413 (codified at 47 U.S.C. §§ 1401-1443, 1457) and *Implementing Public Safety Broadband Provisions of the Middle Class Tax Relief and Job Creation Act of 2012 et al.*, PS Docket No. 12-94 et al., Notice of Proposed Rulemaking, 28 FCC Rcd 2715 (2013).

⁷² Comments of the National Telecommunications and Information Administration, PS Docket No. 12-94 at 3-4 (rec. May 18, 2012) (noting that FirstNet was created in response to the recommendations of the 9/11 Commission Report and Hurricane Katrina Report that public safety agencies need communications equipment which is interoperable across jurisdictions in order to coordinate responses to major incidents).

⁷³ PSSA Dec. 29, 2020 Petition at 12-13 (describing the importance of interoperable equipment that works nationwide).

⁷⁴ *Freeze Public Notice* at 1-2. This freeze includes applicants to license permanent fixed sites. 47 CFR § 90.1207.

licenses, whether for permanent fixed sites or geographic areas, as permitted under the rules.⁷⁵ Those with existing 4.9 GHz licenses may also license new permanent fixed sites within their license areas. We direct the Bureaus to implement this change to the freeze via public notice within 30 days of the adoption of this item. The Bureaus retain jurisdiction to manage and implement the freeze in the future.⁷⁶

26. We reject, however, calls to fully lift the freeze, and instead retain it for all applicants who are not already 4.9 GHz licensees.⁷⁷ Because we continue to evaluate the band's future, the need to "stabilize the 4.9 GHz spectrum landscape and to maximize the Commission's flexibility in considering the appropriate rules governing the band," remains,⁷⁸ and we decline to allow entirely new entrants into the band at this time. We believe this "partial thaw" approach will allow additional public safety use, especially to improve existing deployments, without adding significant additional complexity to the band which could complicate our efforts to rationalize the band's rules and provide for nationwide standards. New entrants facing special circumstances are encouraged to seek a waiver of the freeze pursuant to section 1.925 of the Commission's rules.⁷⁹

IV. EIGHTH FURTHER NOTICE OF PROPOSED RULEMAKING

A. Overview

27. In this *Eighth Further Notice*, we propose to revisit the structure of the 4.9 GHz band to maximize public safety use while exploring options that could spur innovation, improve coordination, and drive down costs in the band. Specifically, we seek to establish a nationwide framework for coordinating access to the band. We believe that a comprehensive and integrated approach that emphasizes public safety needs represents a superior path to unlocking the potential of the 4.9 GHz band rather than pursuing a state-centered approach that could lead to a patchwork of incompatible uses. Similarly, we believe a nationwide approach will promote a robust equipment market, drive down prices and costs, spur innovation, and increase the likelihood of interoperable communications and consistent interference protection. We also explore potentially allowing non-public safety use of the band to encourage a more robust and innovative equipment market, provided that non-public safety use can occur without causing

⁷⁵ For example, an incumbent licensee is permitted to add base stations within its jurisdiction. 47 CFR § 90.1207(c). Also, an incumbent licensee may continue to seek an individual station license if required pursuant to Commission rule section 90.1207(b)(1). 47 CFR § 90.1207(b)(1). In addition to new deployments within its jurisdiction pursuant to an existing geographic area license, a public safety entity may expand operations through leasing from a State Lessor. See NPSTC Dec. 30, 2020 Petition at 4-5 (stating that local and state public safety agencies had the right to apply for and obtain licenses for 4.9 GHz facilities to meet their respective operational requirements prior to the issuance of the *Freeze Public Notice*); see also IAFC March 8, 2021 Comment at 2 (agreeing with NPSTC that the current freeze prevents public safety entities from considering the band as a resource to accommodate system expansions); Letter from APCO International, International Association of Chiefs of Police, Major Cities Chiefs Association, Major County Sheriffs of America, Metropolitan Fire Chiefs Association, National Association of Emergency Medical Technicians, National Association of State EMS Officials, National Public Safety Telecommunications Council, National Sheriff's Association, and Western Fire Chiefs Association, to the Honorable Ajit Pai, Chairman, FCC, WP Docket No. 07-100, at 2 (filed Sept. 21, 2020) (concerned that public safety is frozen from expanding use of the band); Letter from Gene S. Donaldson, TMC Operations Manager, State of Delaware Department of Transportation, to Marlene H. Dortch, Secretary, FCC, WP Docket No. 07-100 (filed Sept. 23, 2020).

⁷⁶ Commission action on the freeze at this time is not intended to affect the authority that the Bureaus have to implement this or other band freezes as appropriate.

⁷⁷ See NPSTC Dec. 30, 2020 Petition at 4-5 (asserting that public safety agencies that did not hold a license prior to the *Freeze Public Notice* have lost the right to apply for a new license with a reasonable expectation that the license would be granted).

⁷⁸ *Freeze Public Notice* at 1.

⁷⁹ 47 CFR § 1.925; see also *Freeze Public Notice* at 2.

harmful interference to public safety operations in the band. As part of this vision, we seek comment on how best to meet the needs of public safety in this band and on establishing a database that would contain consistent and reliable information about what spectrum is available and where and how it is being used. Our goal is to provide greater certainty and predictability to stakeholders seeking to plan and invest in 4.9 GHz deployments and enable spectrum users to coordinate shared use of the band to avoid conflicts. In addition, we seek comment on a range of technical issues, eligibility issues, and other measures intended to increase use of the band.

28. We note that this proceeding has an extensive record, which we intend to draw upon as needed to develop a cohesive set of nationwide rules to maximize use of the band, including protection for public safety operations. We encourage commenting parties to assist us by providing input on the new ideas proposed herein and by submitting additional new proposals or by modifying previous proposals. To the extent that commenters wish to reiterate any proposals that have been previously introduced into the record, commenters should demonstrate that the proposals align with our approach and priorities for the band as described in this *Eighth Further Notice*. We preserve our flexibility to consider and adopt proposals from prior stages of this proceeding that the Commission has not specifically rejected.

B. Ensuring Public Safety Use of the Band

29. As noted above, the band is currently home to 3,541 licensees.⁸⁰ We recognize that these licenses represent a significant investment of scarce public safety resources, so as we explore ways to enhance the usage of the band, we are cognizant that we must protect these investments.

1. Protection for Public Safety Licensees

30. We seek comment in this *Eighth Further Notice* on how to ensure public safety licensees have efficient and interference-free access to the band. Numerous commenters have addressed this issue, and several have expressed support for various approaches to protecting public safety licensees from interference.⁸¹ For instance, NPSTC argues that interference protection, whether “done manually or through some potential future automated frequency coordination approach,” must be incorporated into the management of the band to protect incumbents “against interference and signal degradation.”⁸² We agree, and we tentatively conclude that incumbent public safety licensees as well as future public safety users should be protected from harmful interference, both in the near term and on a forward-looking basis, subject to other requirements and conditions that we may adopt in this proceeding.

31. NPSTC recommends “use of the threshold degradation approach in the ANSI/TIA-10 standard to minimize interference to incumbent fixed operations,” which NPSTC notes “encompass many of the public safety operations” in the band.⁸³ We seek comment on the feasibility of NPSTC’s proposal to use the TIA-10 standard to minimize interference to incumbents that deploy fixed facilities.⁸⁴ Are there

⁸⁰ See *supra* para. 9.

⁸¹ American Association of State Highway and Transportation Officials Comments, WP Docket No. 07-100, at 3-4 (rec. Jan. 12, 2021) (AASHTO Jan. 12, 2021 Comments); Kenneth W. Stuebing Comments, WP Docket No. 07-100, at 3 (rec. Jan. 12, 2021) (filed on behalf of The International Association of Fire Chiefs) (IAFC Jan. 12, 2021 Comments); State of Maryland Department of Information Technology Reply, WP Docket No. 07-100, at 2 (rec. Feb. 12, 2021) (Maryland DoIT Feb. 12, 2021 Reply); National Public Safety Telecommunications Council Comments, WP Docket No. 07-100, at 13-15 (rec. Jan. 13, 2021) (NPSTC Jan. 13, 2021 Comments); Association of Public-Safety Communications Officials-International, Inc. Comments, WP Docket No. 07-100, at 2 (rec. Jan. 13, 2021) (APCO Jan. 13, 2021 Comments).

⁸² NPSTC January 13, 2021 Comments at 14.

⁸³ *Id.* at 14.

⁸⁴ The TIA-10 standard provides a methodology for designing and frequency coordinating fixed point to point microwave relay systems. See TIA Telecommunications Systems Bulletin 10, Interference Criteria for Microwave Systems, (2019), <https://standards.globalspec.com/std/13344063/tia-10> (TIA-10).

alternatives to the TIA-10 standard which could be used to guard against interference between licensees deploying fixed P-P links and P-MP hubs? Under Part 90, contour overlap analysis is often the basis for determining if an applicant's proposed facilities would likely cause interference to an incumbent operator.⁸⁵ Would contour overlap analysis requirements be useful for certain 4.9 GHz band deployments, and if so, what service and interference contour values would be appropriate? We also seek comment on what standards would be appropriate for incumbents deploying non-fixed, geographic-area operations or ad-hoc temporary operations. Commenters are encouraged to address how their proposals would support our tentative conclusion to protect both existing and future public safety licensees in the band as well as interact with potential new non-public safety operations in the band, with specific attention to the licensing and sharing models addressed below.

2. Licensing Database

32. In the *Sixth Further Notice*, the Commission stated that it believed many concerns public safety users have about the 4.9 GHz band could be addressed if more complete technical information were available to all affected parties.⁸⁶ We therefore seek comment on collecting more granular data on 4.9 GHz operations in our licensing database and combining that with a formal coordination structure to improve interference mitigation efforts and bolster public safety confidence in the band. Today, licensees in the 4.9 GHz band only provide our Universal Licensing Service (ULS) database with control points and geographic area of operations. More robust information on public safety operations in the band could help improve predictability for public safety operations and facilitate robust, non-interfering access to the band for non-public safety entities. Therefore, we tentatively conclude that additional information is required, and we seek comment on whether to continue using ULS or to transition to a third-party licensing database to accommodate the additional information. For instance, in the *Sixth Further Notice*, the Commission proposed to maintain ULS as the comprehensive licensing database for the 4.9 GHz band and proposed to modify ULS as necessary to accept the necessary licensing data.⁸⁷ Since ULS can readily accommodate additional information, we seek comment on these proposals. We seek comment on requiring incumbents and future applicants to supply complete microwave path data for links, and to license base stations (currently authorized under the geographic license scheme) on a site-by-site basis.

33. In the *Sixth Further Notice*, the Commission proposed “to require incumbent licensees and new applicants to provide technical information that will enhance frequency coordination and help mitigate the possibility of interference, while permitting more new users.”⁸⁸ We seek comment on this proposal to require incumbents and future applicants in the 4.9 GHz band to submit more information in ULS. Would collecting this data improve the level of interference protection licensees receive in the band? We seek comment on whether collecting this data would create a more predictable and transparent spectrum environment for any current and future users of the band, including potential non-public safety users. To what extent does not having this data currently listed in ULS lead to additional interference or uncertainty in the band? In particular, should licensees specify channels they are using for their operations? In the *Sixth Further Notice*, the Commission also proposed to add the 4.9 GHz band to the ULS microwave schedule⁸⁹ for P-P, P-MP, and proposed to “uncouple base and mobile stations from

⁸⁵ See 47 CFR §§ 90.187(d)(1), 90.621(b)(4), n. 2 to Short Spacing Table, and (d).

⁸⁶ *Sixth Further Notice*, 33 FCC Rcd at 3273, para. 34.

⁸⁷ *Id.* at 3274, para. 35.

⁸⁸ *Id.* at 3273, para. 34. Specifically, applicants seeking to license P-P, P-MP, and fixed receivers would provide the following information: transmitter and receiver antenna coordinates, azimuth (direction), polarization, beamwidth, physical dimensions, gain, and height above ground, as well as transmit details such as power, channel, emission. *Id.* at 3274 n. 93. Applicants seeking to license base/mobile operations would provide the following information: coordinates (base), height above average terrain (base), number of units (mobile), mobile area of operation, power, channels, and emissions. *Id.* at 3274 n. 94.

⁸⁹ See FCC Form 601 at 88-110, Schedule I, available at <https://www.fcc.gov/sites/default/files/fcc-form-601.pdf>.

geographic licenses and instead require that base and mobile technical parameters be entered on the existing location and technical data schedules.”⁹⁰ We seek comment on these ULS schedule proposals and ask commenters to address whether ULS’s existing schedules are sufficient for collecting the additional data.⁹¹

34. What is the burden on incumbents and applicants who would need to submit detailed site-based information, and does the benefit of having additional technical data listed in ULS outweigh that burden? For instance, the Commission estimates the average burden for each applicant completing FCC Form 601 and associated schedules to be 1.25 hours, which includes “the time to read the instructions, look through existing records, gather and maintain required data, and actually complete and review the form or response.”⁹² Is this estimate accurate for incumbents or new applicants who would need to submit the additional technical information described above with their Form 601 application? What is the interplay of these potential new data collection requirements with potential sharing mechanisms, discussed below, that would facilitate shared public safety and non-public safety use of the band?

35. Are there alternatives to collecting additional technical data in ULS for the 4.9 GHz band? For instance, would a database managed by a third party offer advantages over requiring incumbents and new applicants to submit additional information via ULS? If so, what are those advantages and what would be the cost of having a third party administrator manage a database to collect the information needed to increase interference protection in the 4.9 GHz band?⁹³ How would the transition from ULS to a third-party database be implemented? Who would pay that cost and how would those costs impact public safety given that public safety entities are subject to no filing fees in ULS? In other words, would a third-party managed database increase costs on public safety licensees in the band and would those costs outweigh any derived benefits? Commenters that support the use of a third party band manager are encouraged to consider how such a system could work with the various methods of introducing non-public safety operations to the band described below. If we were to pursue this option, who would be suitable to manage the database? How should we select the administrator?

36. Regardless of whether ULS or a third-party database is used to collect technical detail on 4.9 GHz deployments, incumbent licensees with geographic licenses would need time to submit the requisite information. In the *Sixth Further Notice*, the Commission proposed giving incumbent geographic licensees one year to identify in ULS P-P links, P-MP hubs, fixed receivers, base stations, and mobiles that are not currently licensed site-by-site.⁹⁴ The Commission sought comment on whether the status of a license should become secondary if the incumbent licensee does not meet the one-year deadline.⁹⁵ Most parties commenting on this issue concurred with this time period.⁹⁶ We seek comment

⁹⁰ *Sixth Further Notice*, 33 FCC Rcd at 3273-74, para. 35.

⁹¹ Applicants seeking to license P-P, P-MP, and fixed receivers would use FCC Form 601 Schedule I. Applicants seeking to license base/mobile operations would use FCC Form 601 Schedules D and H.

⁹² See FCC Form 601 at 1, available at <https://www.fcc.gov/sites/default/files/fcc-form-601.pdf>.

⁹³ We discuss management of the band and potential third-party database administrators further below.

⁹⁴ *Sixth Further Notice*, 33 FCC Rcd at 3274, para. 36.

⁹⁵ *Id.* at 3275, para. 37.

⁹⁶ Association of Public-Safety Communications Officials-International, Inc. Comments, WP Docket No. 07-100, at 3 (rec. July 5, 2018); National Public Safety Telecommunications Council Comments, WP Docket No. 07-100, at 26 (rec. July 6, 2018); Public Safety Communications Council Comments, WP Docket No. 07-100, at 6 (rec. June 27, 2018); Utilities Technology Council, Edison Electric Institute, National Rural Electric Cooperative Association, and GridWise Alliance Comments, WP Docket No. 07-100, at 26-27 (rec. July 6, 2018); V-COMM, L.L.C. Comments, WP Docket No. 07-100, at 5 (rec. July 6, 2018) (supporting a one-year for geographic licensees to submit technical data in ULS on their deployments). *But see* San Francisco Bay Area Rapid Transit District Comments, WP Docket No. 07-100, at 8 (rec. July 6, 2018) (objecting to rendering an incumbent user’s status secondary if it is unable to meet the one-year filing deadline).

on whether a one-year timetable is still appropriate for incumbent geographic licensees to submit technical data on their deployments into a database, and whether any deterrent, such as the risk of forfeiting primary status, is needed to ensure compliance. On the other hand, given that the purpose of collecting additional technical data is to provide increased interference protection to incumbent licensees, does this benefit provide sufficient incentive for licensees to comply with a timetable requirement?

3. Interoperability

37. The record generated in response to the *Sixth Further Notice* demonstrates that the public safety community employs this band for a wide variety of uses.⁹⁷ As we strive to develop a national framework for this band, we seek to encourage uses that enable collaboration and mutual aid between multiple licensees, for instance, in response to larger incidents and emergencies. To that end, we seek comment on whether to adopt any technical standards for the 4.9 GHz band that would promote interoperability in the band. In other PLMR frequency bands used by public safety, the Commission designates certain channels for interoperability communications,⁹⁸ and in some instances, it also specifies technical requirements for equipment designed to transmit on those channels.⁹⁹ The goal is to ensure that public safety officials from different agencies can communicate on designated interoperability channels regardless of the make or model of their radio equipment.¹⁰⁰

38. We seek comment on whether any interoperability requirements are needed for the 4.9 GHz band. For example, should we designate a band segment or certain channels in the band for interoperable communications? If so, how much spectrum would sufficiently address public safety needs and how should interoperable spectrum be administered to optimize those resources for their primary purpose? For example, should state interoperability coordinators, regional planning committees, or individual agencies administer the use of interoperable 4.9 GHz spectrum? In addition, if we were to set aside spectrum for public safety interoperability purposes, should we also specify technical standards for

⁹⁷ See, e.g., City and County of Denver, Colorado, San Bernardino County, California, and the Government Wireless Technology and Communications Association Reply, WP Docket No. 07-100, at 1-4 (rec. Aug. 6, 2018) (the Denver Police Department uses the band for mobile command vehicles to support Wi-Fi, phones, internet access; to operate a video camera network connected using both 4.9 GHz P-P links and mesh connectivity, as well as bomb robots using 4.9 GHz for remote control and video connectivity; Denver International Airport operates an airport ground tracking system using nine sensors operating on 4.9 GHz frequencies; San Bernardino County uses the band for high-speed data communications, interconnection of automatic license plate readers, interconnection of security cameras, and connection of Project 25 LMR radio sites back to system controllers to enable Law, Fire, and EMS mission critical radio communications); Los Angeles County, California Reply, WP Docket No. 07-100, at 1-2 (rec. Aug. 6, 2018) (the Sheriff Department operating pursuant to a waiver uses the band for air-to-ground live stream video captured by air units; the Fire Department uses a mesh communications link between Life Guard Tower units and dispatch; and the Internal Services Department uses the band to create a WiMax mesh data communications link to ensure continuity of operations during wired infrastructure outages).

⁹⁸ See 47 CFR § 90.20(i).

⁹⁹ For instance, the Commission specifies Project 25 as the standard for equipment designed to operate on interoperability channels in the narrowband segment of the 700 MHz band. Project 25 (P25) is a suite of technical standards, developed collaboratively by public safety agencies and manufacturers, to ensure that two-way radios, regardless of manufacturer, are interoperable. See 47 CFR § 90.548(b)(1)(i) (listing “ANSI/TIA-102.BAAA-A-2003, Project 25 FDMA-Common Air Interface, approved September 2003”). The Project 25 standard applies to interoperability channels intended for both voice and data communications. Analog FM is the standard for interoperability channels in other frequency bands where analog FM was the predominant modulation used on public safety frequencies in those bands. See e.g., 47 CFR §§ 90.20(d)(80), 90.617(a)(1); *Emission Mask Requirements for Digital Technologies on 800 MHz NPSPAC Channels; Analog FM Capability on Mutual Aid and Interoperability Channels*, PS Docket No. 13-209, Report and Order, 31 FCC Rcd 4250, 4275, para. 62 (2016).

¹⁰⁰ See 47 § 90.7 (defining interoperability as an “essential communication link within public safety and public service wireless communications systems which permits units from two or more different entities to interact with one another and to exchange information according to a prescribed method in order to achieve predictable results”).

equipment intended to operate on those channels? Would such a requirement invigorate or stifle innovation and equipment options? Parties discussing interoperability for the 4.9 GHz band should explain if and how the benefits of any such requirements outweigh associated costs. How should interoperability requirements apply to non-public safety entities if we expand eligibility for the band beyond public safety (as discussed below)? What technical and licensing conditions should apply to non-public safety licensees to ensure interoperable and interference-free operations? How could the introduction of non-public safety operations into the band help foster a broader interoperable device marketplace? Should we allow the marketplace to adopt voluntary interoperability standards in lieu of requirements specified in the Commission's rules? If so, how could a voluntary industry standard promote interoperability between all eligible users of the band?

4. Public Safety Priority and Preemption

39. An important element of public safety spectrum use, particularly where spectrum is shared with non-public safety users, is ensuring that public safety will have immediate and reliable access to spectrum whenever and wherever it is required for mission-critical operations. We therefore seek comment on affording public safety licensees priority access to the 4.9 GHz band, including the ability to preempt any non-public safety operations that may be authorized in the band.

40. APCO states in its 2015 report that ,while it supports an approach to the band which fosters development in the commercial sector of “more cost effective equipment,” any such solution must afford “priority and preemption for public safety users in a shared environment.”¹⁰¹ We note that there are other instances where public safety users are afforded priority network access and the ability to preempt the operations of other users in emergency circumstances.¹⁰² If we open the 4.9 GHz band to non-public safety users, as discussed below, we seek comment on whether public safety priority and preemption should be elements of any sharing model we ultimately adopt. We seek comment on this approach and how best to accomplish that goal in the 4.9 GHz band.

41. For instance, we seek comment below on whether excess capacity leasing or a dynamic spectrum sharing system could effectively enable sharing between public safety and non-public safety. If so, to what extent and by what method could these sharing models ensure priority and preemption for public safety operations? Are priority and preemption sufficient tools to ensure public safety mission-critical operations access to the band under an excess capacity or dynamic spectrum sharing scheme? How would priority and preemption work under other spectrum sharing models?

42. If we adopt rules for public safety priority and preemption, we seek comment on the types of mission-critical public safety operations that should have priority over other public safety as well as non-public safety operations. Given the wide range of possible deployments in the 4.9 GHz band, both geographically and in terms of type of use, how should public safety licensees with overlapping operating areas determine priority and preemption rights and whether certain deployments or types of communications should have priority? For instance, should emergency mobile deployments at an incident scene be able to preempt fixed P-P links that may be operating on a primary basis? Does the primary status of a license or deployment have any bearing on priority and preemption? How do two overlapping licensees that both have primary status determine priority if they seek to use the same channel at the same time? We seek comment on how to ensure that mission-critical communications maintain consistent priority, no matter what deployment form they may take.

¹⁰¹ APCO Sept. 28, 2015 Report at 14.

¹⁰² In the 700 MHz band, both FirstNet and Verizon offer priority and preemption to public safety users on their respective networks. See FirstNet, *How priority and preemption help public safety connect when they need it most* (Jul. 16, 2020), <https://firstnet.gov/newsroom/blog/experience-firstnet-how-priority-and-preemption-help-public-safety-connect-when-they>; Verizon, *Verizon unveils public safety private core* (Mar. 27, 2018), <https://www.verizon.com/about/news/verizon-unveils-public-safety-private-core>.

43. Finally, we seek comment on the technical feasibility of building priority and preemption algorithms into 4.9 GHz networks and equipment to enable authorized public safety users to obtain priority and preempt use of the spectrum if necessary. In contrast to instances where public safety and non-public safety operate on a single shared network, 4.9 GHz licensees operate on disparate networks. How does this affect the availability of priority and preemption solutions? Is there a demand in the equipment marketplace for priority and preemption tools, and if not, should we require 4.9 GHz band equipment to include such tools? What equipment security requirements could we impose to avoid unauthorized signaling of priority? What would be the cost of incorporating priority and preemption algorithms into equipment?

C. Fostering Greater Public Safety Use of the Band

44. Regardless of what eligibility rules or sharing model we may ultimately adopt, we anticipate that the future of this band includes a robust public safety presence. We tentatively conclude that a nationwide, coordinated approach to the management of the spectrum will not only increase the utility of this band for public safety, but will also promote greater public safety use of the band by providing greater certainty with regards to the availability of the spectrum and interference protection. In this section, we explore ways to make the spectrum environment more attractive to existing and future public safety users.

1. Frequency Coordination

45. We seek comment on requiring formal frequency coordination in the 4.9 GHz band to support interference protection and increase public safety confidence in using the band. As noted above, our rules currently allow licensees in the 4.9 GHz band to deploy base stations, mobile units, and temporary fixed stations anywhere within the licensee's jurisdiction without formal frequency coordination. Rather, our rules direct licensees to informally coordinate with other users in the band by cooperating in "the selection and use of channels in order to reduce interference and make the most effective use of the authorized facilities."¹⁰³

46. The Commission previously contemplated frequency coordination as a means to encourage increased public safety use of the band. In 2009, the Commission noted that, "[w]ithout a specific coordination procedure in place, interference issues may arise between co-primary permanent fixed stations or other co-primary users of the band."¹⁰⁴ In the *Sixth Further Notice*, the Commission stated that "neither self-coordination nor a notice-and-response coordination procedure is likely to be sufficient to ensure interference protection to primary users in a mixed use environment."¹⁰⁵ APCO argues in its 2015 report that "new frequency coordination procedures designed to improve usage, performance, and interference protection" would increase interest in the band by the public safety community and "provide incentives for equipment vendors to direct investment into this market."¹⁰⁶

47. Therefore, in this *Eighth Further Notice*, we tentatively conclude that some form of formal frequency coordination, whether through a coordination method discussed in this subsection and/or a dynamic spectrum sharing model as discussed further below, is necessary to support interference protection and increase public safety confidence in using the band. We seek comment on this tentative conclusion. Would mandatory frequency coordination provide certainty and incentives for public safety to increase its use of the band? Would it encourage equipment manufacturers to invest in developing new

¹⁰³ See 47 CFR § 90.1209(b).

¹⁰⁴ *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, 4317, para. 44 (2009). In 2009, the 4.9 GHz band was designated exclusively for public safety purposes, as it is now.

¹⁰⁵ *Sixth Further Notice*, 33 FCC Rcd at 3271, para. 27.

¹⁰⁶ APCO Sept. 28, 2015 Report at 10.

and low cost equipment for the band? If we adopt frequency coordination requirements, should they also apply to applications for non-public safety uses, insofar as such uses are permitted? If so, what criteria should coordinators apply to ensure that proposed non-public safety uses will not interfere with public safety operations?

48. If we adopt formal frequency coordination for the 4.9 GHz band, what type of frequency coordination would most effectively promote innovative use of the band while protecting against interference? In certain spectrum bands under Part 90, applicants seeking to license a new frequency or modify existing facilities must demonstrate that their application was coordinated by a Commission-certified frequency coordinator.¹⁰⁷ The certified frequency coordinator recommends the most appropriate frequency for the proposed operation.¹⁰⁸ Another type of frequency coordination that does not rely on certified frequency coordinators is used for applicants in the fixed microwave service. Part 101 requires that an applicant coordinate proposed facilities with existing licensees and other applicants whose facilities could be affected by the new proposal, i.e., “notice-and-comment” type frequency coordination.¹⁰⁹ We seek comment on whether Part 90 type frequency coordination, Part 101 type frequency coordination, or a combination of the two would be best suited for the 4.9 GHz band.¹¹⁰ Should Part 101 type coordination apply only to P-P or P-MP deployments in the 4.9 GHz band since those deployments are similar to deployments licensed under Part 101 of the Commission’s rules, or could it apply to additional deployments? What are the costs associated with Part 101 type coordination, including the time and effort to identify all incumbent licensees who must be notified, and how do those costs compare to Part 90-type frequency coordination?¹¹¹ Do the benefits of frequency coordination outweigh any associated costs? Furthermore, below we seek comment on a Spectrum Access System (SAS) managed shared access model to facilitate non-public safety use of the band. Therefore, we seek comment on whether a SAS model could be used either in lieu of, or in parallel with, frequency coordination methods discussed above.

49. Next, we seek comment on how formal frequency coordination would apply to temporary or ad hoc deployments in the 4.9 GHz band. In particular, we seek comment on how to balance the need for public safety agencies to deploy temporary or ad hoc operations while protecting licensees with permanent deployments from interference. We also seek comment on what interference standard(s) should be the basis for any frequency coordination method adopted for the 4.9 GHz band.¹¹² We seek comment on whether to incorporate the technical standard for frequency coordination into our rules, or rely on either an industry-agreed standard or frequency coordinator consensus. What should be the process for permitting Commission review of any disputes arising from the frequency coordinator’s actions, and how should Commission staff resolve such disputes?

50. If we adopt a coordination approach for the 4.9 GHz band that requires use of certified frequency coordinators, what criteria should the Commission use to certify coordinators? Should eligibility be limited to coordinators already approved to coordinate Public Safety Pool frequencies, or should it be open to other parties? Should prospective coordinators be required to demonstrate a specific level of technical expertise with respect to 4.9 GHz operations in order to be certified?

¹⁰⁷ 47 CFR § 90.175.

¹⁰⁸ *Id.* § 90.175(a).

¹⁰⁹ *Id.* § 101.103(d)(1).

¹¹⁰ See NPSTC Oct. 24, 2013 Plan at 6 (NPSTC supported blending some elements of Part 101 coordination with traditional Part 90 frequency rules to “achieve better spectrum reuse and still maintain a relatively simple quick process for users to become operational.”).

¹¹¹ See, e.g., *Sixth Further Notice*, 33 FCC Rcd at 3271-72, para. 28 (stating that “public safety frequency coordinator fees for frequency pair/site combinations range from \$60 to \$315 depending on the frequency band.”).

¹¹² See *supra* section **Error! Reference source not found.**

2. Nationwide Band Manager

51. We seek comment on the concept of designating a single entity to serve as a nationwide band manager or licensee for the 4.9 GHz band. Assigning spectrum management responsibility to a single nationwide entity might simplify the task of developing a national framework for the band, and has been supported by some commenters.¹¹³ However, this approach would also represent a marked departure from the approach that we have applied to the band up to this point, and it raises a variety of significant policy, legal, and operational questions.

52. We seek comment on the concept of designating a single nationwide band manager that would be responsible for developing a nationwide framework for the band. For example, the Commission has adopted band manager rules for the 700 MHz Guard Bands,¹¹⁴ and WTB has permitted certain entities to engage in band manager activities via waiver request for the 220 MHz band.¹¹⁵ What entities would be appropriate for such a role in the 4.9 GHz band? How would the Commission differentiate between competing proposals to become the single nationwide band manager? If we were to pursue a nationwide band manager approach, we seek comment on appropriate rules or guidelines to define how the band manager would be authorized to select and manage users of the band. Would a band manager's duties be limited to merely developing a nationwide framework, or would a band manager take a more active role in evaluating applications? Would a band manager decide who can use the spectrum? Should we impose reporting requirements on a 4.9 GHz band manager, and, if so, what should those reports address and how often should they be filed with the Commission?¹¹⁶ What would be an appropriate level of compensation for the band manager? If the Commission moves forward with dynamic spectrum sharing, could one or more dynamic spectrum sharing system administrators assume the role of band manager, and would such designation be appropriate?

53. We also seek comment on establishing a national license for the 4.9 GHz band. If we were to adopt this approach, what rights and responsibilities over the band should be associated with the national license, and what rights should be reserved for state, local, tribal, or regional public safety licensees? As proposed above, we envision that incumbent licensees in the band would retain spectrum rights and would be entitled to protection of their facilities. Would all other spectrum rights be invested in the national licensee? If yes, what obligation should the national licensee have to ensure access to the band by sub-national public safety entities? If we were to allow public safety and non-public safety

¹¹³ See, e.g., Comments from the Public Safety Spectrum Alliance, WP Docket No. 07-100 (rec. Aug. 25, 2020) (PSSA Aug. 25, 2020 *Ex Parte*) (advocating for the Commission to assign the entire band on nationwide basis to FirstNet and to require FirstNet to develop a spectrum plan for the band).

¹¹⁴ See 47 CFR § 27.601. A 700 MHz Guard Band licensee may enter into lease arrangements to permit spectrum lessees to construct and operate stations at any available site and on any channel under the Guard Band license and consistent with Commission rules. *Id.* § 27.601(a). Spectrum lessees may delete, move, or change operating parameters that are covered under the 700 MHz Guard Band licensee's authorization without prior Commission approval. *Id.* § 27.601(b).

¹¹⁵ *Request for Waivers to Provide Band Management Services Utilizing Licenses in the 220-222 MHz Band*, WT Docket 02-224, Memorandum Opinion and Order, 17 FCC Rcd 20464 (WTB 2002) (*Access 220 MO&O*); *Access 220, LLC., Assignor, and Spectrum Equity, Inc., Assignee, Application for Assignment of 220 MHz Licenses and Request for Waiver*, Memorandum Opinion and Order, 27 FCC Rcd 9321 (WTB 2012). The 220 MHz band manager provides users with "access to 220 MHz spectrum based on a tailored coverage area and an individually negotiated agreement." *Access 220 MO&O*, 17 FCC Rcd at 20468, para. 14. Among other duties, the 220 MHz band manager ensures that users comply with applicable Commission rules, has the right to suspend or terminate a spectrum user's operation if it is causing harmful interference, and resolves disputes between its customers. *Access 220 MO&O*, 17 FCC Rcd at 20470, para. 17.

¹¹⁶ The 700 MHz Guard Band licensee and 220 MHz band manager must file annual reports with the Commission. 47 CFR § 27.607; *Access 220 MO&O*, 17 FCC Rcd at 20470, para. 17; see also <https://www.fcc.gov/wireless/bureau-divisions/mobility-division/700-mhz-guard-bands/annual-guard-band-reports>.

sharing of the band as discussed further below, would the national licensee be responsible for management or oversight of the sharing process? Finally, if we were to establish a national license, what process should we establish for accepting applications and selecting a licensee? What qualifications or attributes should be required to be eligible to apply for the license? If more than one entity applied to be the national licensee, how would the Commission adjudicate between competing applications?

3. Regional Planning Committees

54. Our current 4.9 GHz licensing regime is loosely based on a voluntary regional planning framework. Section 90.1211(a) of the Commission's rules provides that each Regional Planning Committee (RPC) may submit a plan with guidelines to be used for sharing 4.9 GHz spectrum within the RPC region.¹¹⁷ The rules list elements to be included in regional plans and provide instructions for plan modifications.¹¹⁸ Although the Commission originally set a deadline for all RPCs to submit 4.9 GHz regional plans, it subsequently stayed the deadline and made plan submission voluntary.¹¹⁹ To date, only 10 out of 55 RPC regions have submitted 4.9 GHz regional plans.¹²⁰

55. In the *Sixth Further Notice*, the Commission stated its belief that RPCs should play an integral role in shaping use of the 4.9 GHz band through regional planning.¹²¹ The Commission proposed to allow RPCs to submit 4.9 GHz band regional plans, which could include region-specific technical guidelines.¹²² APCO noted that the *Sixth Report and Order* abandoned these proposals,¹²³ and in the latest round of comments, NPSTC and AASHTO suggest that active RPCs could serve a valuable role in helping to manage the 4.9 GHz band in their regions.¹²⁴

56. As we endeavor to establish a nationwide spectrum management framework for the 4.9 GHz band, we seek comment on whether RPCs should play a continued or expanded role. Should we continue to make the filing of regional plans optional, or should we require RPCs to file regional plans? In light of the fact that only 10 of 55 RPCs have filed voluntary plans, what resources would RPCs need to ensure that plans were filed for all regions? If we were to adopt frequency coordination requirements for the band as discussed above, would RPCs have the technical expertise and resources to serve as coordinators?¹²⁵ To what degree is regional planning consistent with our goal of establishing a national framework for management of the band that would encourage development of standardized equipment and promote interoperability? Should we develop a standardized template to ensure that all regional plans

¹¹⁷ 47 CFR § 90.1211(a).

¹¹⁸ *Id.* § 90.1211(b)-(c).

¹¹⁹ See *4.9 GHz Third Report and Order*, 18 FCC Rcd at 9169-70, para. 40 (setting the deadline); *The 4.9 GHz Band Transferred from Federal Government Use*, WT Docket No. 00-32, Order, 19 FCC Rcd 15270 (2004) (staying the deadline); *The 4.9 GHz Band Transferred from Federal Government Use*, WT Docket No. 00-32, Memorandum Opinion and Order, 19 FCC Rcd 22325, 22333, paras. 19-20 (2004) (making plan submission voluntary).

¹²⁰ See WT Docket No. 00-32. Regions that have submitted plans include Regions 12 (Idaho), 41 (Utah), 8 (New York City Metropolitan Area), 16 (Kansas), 24 (Missouri), 39 (Tennessee), 6 (Northern California), 5 (Southern California), 11 (Hawaii), and 19 (New England).

¹²¹ *Sixth Further Notice*, 33 FCC Rcd at 3276, para. 41.

¹²² *Id.* at 3276, paras. 41-42. See 47 CFR § 90.1211(a) (stayed indefinitely).

¹²³ APCO Dec. 29, 2020 Petition at 7.

¹²⁴ NPSTC Jan. 13, 2021 Comments at 19 (but noting that "RPC involvement is merely voluntary and does not exist in all regions"); AASHTO Jan. 12, 2021 Comments at 5; see also Grundy County Joint Emergency Telephone System Board Comments, WP Docket No. 07-100, at 5 (rec. Dec. 31, 2020) (Grundy County JETSB Dec. 31, 2020 Comments) (supporting the past methodology of band management through the use of RPCs).

¹²⁵ See Iowa Statewide Interoperable Communications System Board Comments, WP Docket No. 07-100, at 2 (rec. Jan 8, 2021) (noting that the RPCs serve this purpose in the 700 MHz and 800 MHz bands).

are consistent and support a nationwide approach? Should we allow RPCs to file alternative regional plans that vary from a standardized approach? In the proposal that it filed in 2013, NPSTC stated that “a single national plan for 4.9 GHz will meet most regions’ needs,” but “some regions will need some different parameters to better meet needs of users in their regions.”¹²⁶ Is this a viable approach in today’s environment?

4. Incentivizing Use of Latest Commercially Available Technologies

57. We seek comment on ways to incentivize public safety use of the latest commercially available technologies, particularly 5G. As a general matter not limited to any particular spectrum band, what is the path for public safety to use 5G? Would public safety agencies be able to deploy custom 5G networks themselves, with the aid of consultants and contractors as necessary? What commercial 5G offerings are available to public safety, and what are the priority and preemption capabilities of such solutions? We also seek comment on the value, utility, and potential of the commercially available technologies, such as 5G, to public safety. For instance, PSSA asserts that 5G functionality is expected to be the future of public safety cellular communications because it will support new high-speed applications that leverage rich media, such as augmented and virtual reality, and video streaming, while also offering extremely low latency, allowing true real-time data streaming and transfer necessary for use of autonomous vehicles, bomb and hazardous material detection and remediation, and mobile video surveillance capabilities.¹²⁷ Nokia states that “[n]ew technologies enabled by 5G can also allow for network slicing that can provide greater certainty for enhanced security and other quality of service metrics that may be required for public safety incumbent use cases as well as certain potential ... [commercial] use cases.”¹²⁸ We seek comment on PSSA’s and Nokia’s views. What capabilities and applications could 5G and other advanced technologies enable for public safety? We seek comment on any public safety use cases supported by 5G and other advanced technologies.

58. In the *Sixth Report and Order*, the Commission noted that some countries have considered, or are considering, allocating the 4.9 GHz band for 5G, and noted that successful international harmonization efforts could provide further advantages in the availability and price of equipment, thus potentially increasing its utility for flexible use.¹²⁹ The *Seventh Further Notice* specifically sought comment on whether 5G wireless operators, among others, could put the 4.9 GHz spectrum to use.¹³⁰ Some commenters support further exploration of potential 5G deployments in the 4.9 GHz band.¹³¹ PSSA states that “as spectrum falling within the mid-band, 4.9 GHz is significantly better suited [than the 700 MHz band public safety broadband spectrum] to offer 5G capabilities.”¹³² We seek comment on the potential for the 4.9 GHz band to support applications enabled by 5G technology, including but not

¹²⁶ NPSTC Oct. 24, 2013 Plan at 12-13.

¹²⁷ PSSA Dec. 29, 2020 Petition at 17-18.

¹²⁸ Nokia Comments, WP Docket No. 07-100, at 3 (rec. Jan. 13, 2021) (Nokia Jan. 13, 2021 Comments).

¹²⁹ *Sixth Report and Order*, 36 FCC Rcd at 1964, para. 15 citing Analysys Mason *5G Mid-Band Spectrum Global Update*, REF: 2020391-62, March 2020 at Annex A, A.3 and A.6 (noting that China and Hong Kong have licensed 4.9 GHz band spectrum for 5G), <https://api.ctia.org/wp-content/uploads/2020/03/5G-mid-band-spectrum-global-update-march-2020.pdf>.

¹³⁰ *Seventh Further Notice*, 36 FCC Rcd at 1984, para. 68.

¹³¹ Nokia Jan. 13, 2021 Comments at 2 (Nokia “appreciates the Commission’s recognition that the 4.9 GHz band has been identified internationally as a 5G band, and that the U.S. has the opportunity to leverage benefits to price and availability of equipment that a global ecosystem can bring”); Letter from Henry G. Hultquist, Vice President, Federal Regulatory, AT&T Services, Inc., to Marlene H. Dortch, Secretary, FCC, WP Docket No. 07-100, WC Docket No. 20-445 (filed Feb. 2, 2021) (recommending that the Commission seek comment on how to promote 5G use of the band for public safety).

¹³² PSSA Dec. 29, 2020 Petition at 17.

limited to the examples suggested by PSSA and Nokia. Is development of 5G in the band technically feasible, and what are the potential benefits and costs of such development? Could the technical capabilities of 5G technology promote more intense use of the 4.9 GHz band by public safety entities? In the context of our objectives to establish a national framework that ensures public safety priority, how can we create conditions in the 4.9 GHz band that will encourage deployment of 5G and subsequent innovative technologies? As in other spectrum bands, our strong preference is to adhere to a technology-neutral policy for the band and strive for operational flexibility. Do any of the existing 4.9 GHz rules in part 90 (i.e., subpart Y)¹³³ impede or discourage 5G deployments?

59. We also seek comment on commercial interest in the 4.9 GHz band for 5G, whether for public safety offerings, for non-public safety, or a sharing combination. Could commercial 5G providers and operators put 4.9 GHz spectrum to use? Could 5G technology also enhance opportunities for shared public safety and non-public safety use of the band? If so, how?

5. Other Technical Options

60. Although we seek comment above on certain prominent proposals from the *Sixth Further Notice*, the Commission proposed several other technical rule changes to increase utilization of the 4.9 GHz band.¹³⁴ We incorporate these proposals by reference. In particular, the Commission proposed to (1) expand the channel aggregation bandwidth limit from 20 to 40 megahertz;¹³⁵ (2) accord primary status for all P-P and P-MP links on Channels 14-18 of the band plan;¹³⁶ (3) limit temporary P-P operation to thirty days maximum over a given path over a one-year period;¹³⁷ (4) raise the minimum antenna gain for P-P antennas to 26 dBi;¹³⁸ (5) require all 4.9 GHz geographic licensees to place at least one base or temporary fixed station in operation within 12 months of license grant; (6) reduce the construction period for fixed P-P stations from 18 months to 12 months;¹³⁹ and (7) allow manned aeronautical mobile, not including unmanned aeronautical systems (UAS), and robotic use in the lowest five megahertz of the band with altitude and other technical limitations.¹⁴⁰ The Commission also sought comment on how to encourage voluntary implementation of technical standards for the band¹⁴¹ and on power limits and emission masks.¹⁴² We seek comment on these proposals and open issues, and seek comment on whether

¹³³ 47 CFR part 90, subpart Y.

¹³⁴ *Sixth Further Notice*, 33 FCC Rcd at 3277-83, paras. 45-63.

¹³⁵ *Id.* at 3265, para. 10; *see also* 47 CFR § 90.1213(a) (frequencies are permitted to be aggregated for channel bandwidths of 5, 10, 15 or 20 MHz).

¹³⁶ *Sixth Further Notice*, 33 FCC Rcd at 3278-79, para. 48. Currently, only links that deliver broadband traffic are accorded primary status, while links that do not meet this criterion are secondary. *See* 47 CFR § 90.1207(d).

¹³⁷ *Sixth Further Notice*, 33 FCC Rcd at 3279, para. 50.

¹³⁸ *Id.* at 3281, para. 56 (also proposing a maximum 5.5 degree beamwidth and minimum 25 dB front-to-back ratio, and proposing to grandfather existing links from having to replace antennas). Currently, high power P-P and P-MP links may use directional antennas with gains greater than 9 dBi and up to 26 dBi with no reduction in conducted output power, but if antennas with a gain of more than 26 dBi are used, the maximum conducted output power and peak power spectral density must be reduced by the amount in decibels that the directional gain exceeds 26 dBi. *See* 47 CFR § 90.1215(a)(2).

¹³⁹ *Sixth Further Notice*, 33 FCC Rcd at 3283, para. 63. *See* 47 CFR § 90.1209(d) (imposing an 18-month construction deadline only on fixed P-P stations that are licensed on a site-by-site basis, and no construction deadline for base and temporary fixed stations).

¹⁴⁰ *Sixth Further Notice*, 33 FCC Rcd at 3266-70, paras. 12-24.

¹⁴¹ *Sixth Further Notice*, 33 FCC Rcd at 3278, para. 46.

¹⁴² *Id.* at 3281-82, para. 57 (seeking comment on maximum EIRP levels of 65.15 dBm for P-P and 55.15 dBm for P-MP, or other power levels, and on whether emission mask M or a tighter emission mask is sufficient).

we should include any of them going forward as part of our proposed national framework.

D. Facilitating Non-Public Safety Access to the Band

61. While we emphasize the importance of public safety operations in the 4.9 GHz band, we also recognize that introducing non-public safety operations in the band may help to foster innovation and drive down equipment costs, thereby making more intensive public safety use of the spectrum a possibility. To that end, we seek comment on expanding use of the band to non-public safety entities, subject to appropriate safeguards to protect public safety operations. We also seek comment on ensuring a cohesive and predictable shared spectrum landscape that would also allow for planning and investing in the band by public safety and non-public safety users alike.

62. In this *Eighth Further Notice*, we seek comment on whether and how to allow non-public safety entities access to the 4.9 GHz band for non-public safety operations, with particular emphasis on expanding use of the band under a nationwide framework. We seek comment on whether it is in the public interest to open the band to non-public safety uses, and under what terms. We seek comment on whether such a policy has the potential to not only promote efficient use of valuable mid-band spectrum, something which we have recognized repeatedly is in the public interest,¹⁴³ but also to reduce equipment costs and spur innovation, which will benefit public safety users as well.¹⁴⁴ We also seek comment on any costs public safety may incur if the band is shared with other users, such as in the need to replace equipment or modify usage. Would use of the band by non-public safety entities make it less reliable for public safety agencies that use the band for critical safety of life communications? If so, how can we address these concerns?

63. If we decide to allow non-public safety use of the 4.9 GHz band, we seek comment on how best to do so. Given that all public safety licenses issued for the 4.9 GHz band to date allow full access to its entire 50 megahertz¹⁴⁵ and the public safety operations that it hosts are of critical importance, we recognize that any sharing regime will be complex. During earlier stages of this proceeding, several stakeholders put forth proposals to permit non-public safety use of the band, some of which have received qualified support from public safety stakeholders.¹⁴⁶

¹⁴³ See, e.g., *Amendment of the Commission's Rules with Regard to Commercial Operations in the 3550-3650 MHz Band*, GN Docket No. 12-354, Report and Order and Second Further Notice of Proposed Rulemaking, 30 FCC Rcd 3959 (2015) (3.5 GHz Order) (the Commission added co-primary fixed and mobile allocations to the 3550-3650 MHz band to facilitate a new commercial broadband service at 3550-3700 MHz); *Expanding Flexible Use of the 3.7 to 4.2 GHz Band*, GN Docket No. 18-122, Order and Notice of Proposed Rulemaking, 33 FCC Rcd 6915, 6917-18, para. 5 (2018) (3.7 GHz NPRM).

¹⁴⁴ See Letter from Louis Peraertz, Vice President of Policy, Wireless Internet Service Providers Association, to Marlene H. Dortch, Secretary, FCC, WP Docket No. 07-100, at 2 (filed Sept. 17, 2021) (5 GHz band equipment “can be easily adapted for operation in the 4.9 GHz band”) (WISPA Sept. 17 *Ex Parte*).

¹⁴⁵ 47 CFR §§ 90.1207, 90.1209(a).

¹⁴⁶ See NPSTC Oct. 24, 2013 Plan at 2 ([a]s part of this plan, the potential to share with other compatible user groups was examined[,] and rules that protect public safety users while allowing the other non-public safety users to effectively use the band will be proposed); APCO Dec 30, 2020 Petition at 7-8 (stating that public safety entities are generally not opposed to and recognize the benefits of sharing the band with non-public safety users provided adequate safeguards are in place); Enterprise Wireless Alliance Comments, WP Docket No. 07-100, at 3-4 (rec. Jan. 13, 2021) (supporting expansion of eligibility beyond public safety operations as long as there are appropriate technical and operational regulations in place); Nokia Jan. 13, 2021 Comments at 2 (stating that it looks forward to being a part of an ecosystem where there are “innovative cost-sharing arrangements between public safety licensees and non-public safety lessees”); Wireless Internet Service Providers Association Comments, WP Docket No. 07-100, at 2 (rec. Jan. 13, 2021) (“the band [should be] available for commercial use on a shared basis with public safety users”) (WISPA Jan. 13, 2021 Comments); Maryland DoIT Feb. 12, 2021 Reply at 2-3 (supporting expansion to non-public safety use as long as public safety communications are protected and prioritized).

64. As part of these different potential non-public safety use frameworks, we seek comment on the types of non-public safety operations which should be permitted, and the types of entities that should be eligible for access. Should we allow all types of commercial use, but limit the types of users?¹⁴⁷ For example, the Commission has previously recognized that railroad, power, and petroleum entities use radio communications “as a critical tool for responding to emergencies that could impact hundreds or even thousands of people.”¹⁴⁸ Therefore, we seek comment on whether critical infrastructure (CII) eligible entities should be permitted access to the band in a way distinct from other classes of non-public safety users.¹⁴⁹ We also seek comment on whether shared CII access to the band will sufficiently increase use of the band nationwide to encourage innovation and impact equipment costs.

65. We seek comment on these possible alternatives, in particular on the interplay of different elements of the possible approaches to improve access to the band and facilitate non-public safety use. In other words, these components should not be viewed as mutually exclusive and, indeed, any comprehensive framework that we may adopt will likely include elements of multiple access models and licensing approaches discussed below. Commenters that support opening the band for non-public safety applications are encouraged to submit detailed proposals—including cost-benefit analyses—on these issues, incorporating elements of different options discussed below and explaining why they are preferable to alternatives.

1. Shared Access Models

66. We seek comment below on possible sharing mechanisms, non-public safety licensing approaches, and leasing regimes that could be used to provide shared access to the band for non-public safety users while protecting—and, potentially, improving—critical public safety operations. These options are not exclusive of one another (e.g., excess capacity leasing could be combined with a dynamic sharing mechanism) and commenters are encouraged to submit detailed proposals addressing how a comprehensive sharing regime could be implemented.

a. Excess Capacity Leasing

67. One potential means of sharing the band between public safety and non-public safety users involves leasing of excess capacity on public safety networks to non-public safety users. For example, a public safety licensee which has constructed a network of fixed sites for its operations, but only uses that network in emergencies, could lease the use of that network when no such emergency is occurring. Alternatively, a public safety licensee could work with a commercial wireless operator to construct a dual-use system pursuant to its license. Are such excess capacity leasing arrangements feasible for this band and, if so, could they provide potential benefits to public safety licensees? Could such leasing arrangements facilitate more robust deployment of 4.9 GHz public safety networks? What types of non-public safety entities would be interested in leasing excess capacity from public safety licensees? Commenters that support excess capacity leasing should address the specific costs and benefits of such a regime, giving particular consideration to the non-exclusive nature of the public safety licenses in this band, the current and potential future coordination mechanisms discussed herein, and the wide

¹⁴⁷ In its September 23, 2021 *Ex Parte* letter, WISPA states that any user that meets the Commission’s interference protection and device certification requirements should have access to the band, and non-public safety use should not be limited to CII. Letter from Louis Peraertz, Vice President of Policy, Wireless Internet Service Providers Association, to Marlene H. Dortch, Secretary, FCC, WP Docket No. 07-100, at 1 (filed Sept. 23, 2021).

¹⁴⁸ *Sixth Further Notice*, 33 FCC Rcd at 3285, para. 70; see also *Replacement of Part 90 by Part 88 to Revise the Private Land Mobile Radio Services and Modify the Policies Governing Them and Examination of Exclusivity and Frequency Assignments Policies of the Private Land Mobile Service*, PR Docket No. 92-235, Second Report and Order, 12 FCC Rcd 14307, 14329-330, para. 41 (1997).

¹⁴⁹ NPSTC proposes to extend CII entities co-primary access to two five-megahertz channels (Channels 6 and 7) immediately but offer CII co-primary status over the entire band after a three-year period. NPSTC Oct. 24, 2013 Plan at 10-11.

range of different uses this band hosts.

68. If we choose to implement an excess capacity leasing regime, we seek comment on how that regime should be implemented and how the rights of public safety and non-public safety entities should be managed. Given the importance of public safety operations in the band, should we ensure priority and preemption for such operations vis-à-vis non-public safety lessees? If so, how can we best do so? What specific rule-based mechanisms should we implement to ensure a consistent and publicly accountable leasing system? How should we address the overlapping rights of different public safety licensees in the band to ensure a stable and predictable spectrum environment for public safety operations? If we designate a single nationwide band manager, as discussed above,¹⁵⁰ could that entity have a role in facilitating leased access to excess capacity on public safety networks? Alternatively, could these issues be addressed by utilizing a SAS, as discussed below?¹⁵¹ Specifically, could a SAS be used to manage leases and coordinate access for lessors and lessees? How would such a system work within the Commission's existing leasing rules?

b. Spectrum Access System (SAS) Managed Shared Access

69. In the *Seventh Further Notice*, the Commission sought comment on whether a dynamic spectrum access system could be used to facilitate non-public safety use of the band alongside public safety access.¹⁵² The Commission noted that such opportunistic use of spectrum is permitted in several other spectrum bands using a variety of different automatic sharing systems that rely on databases to ensure protection of other users. We expand on the Commission's earlier inquiry and seek comment on whether a dynamic frequency coordinator—such as the SAS used to coordinate access to the Citizens Broadband Radio Service in the 3.55-3.7 GHz band (3.5 GHz band)¹⁵³—could be used to facilitate sharing between public safety and non-public safety users.

70. In the 3.5 GHz band, SASs currently are used to protect several types of incumbent operations—including critical Department of Defense radar systems, fixed satellite service earth stations, and incumbent terrestrial wireless licensees—as well as two tiers of users in the Citizens Broadband Radio Service. A similar system could be used to protect public safety operations in the 4.9 GHz band. Would a SAS be the most appropriate system to coordinate dynamic spectrum sharing in this band? Or would another model, like the Automatic Frequency Coordination system in the 6 GHz band,¹⁵⁴ be more appropriate? For either system, what, if any, modifications would be necessary to address the unique needs of public safety users in the 4.9 GHz band? What would be the costs associated with such a system, both its setup and its implementation going forward, and how would those costs compare to the cost of traditional Part 90 frequency coordination? Who would be responsible for those costs? Should the Commission maintain the system, or should it contract the responsibility to a third-party?

¹⁵⁰ See *supra* para. 52.

¹⁵¹ See *infra* paras. 69-74.

¹⁵² *Seventh Further Notice*, 36 FCC Rcd at 1984-85, paras. 71-72. Comments received on this topic addressed the issue in the context of the State Lessor framework which no longer applies. However, commenters did express both support and concerns about the use of dynamic spectrum sharing generally. See Federated Wireless, Inc. Comments, WP Docket No. 07-100, at 1-4 (rec. Jan. 13, 2021); Federated Wireless, Inc. Reply, WP Docket No. 07-100, at 1-3 (rec. Feb. 12, 2021); Nokia Jan. 13, 2021 Comments (all expressing support for dynamic spectrum sharing); NPSTC Jan. 13, 2021 Comments at 3-4 (expressing concerns about funding a dynamic spectrum sharing system and ensuring equipment compatibility); APCO Jan. 13, 2021 Comments at 1-2 (describing dynamic spectrum sharing as “likely necessary (but not sufficient)”).

¹⁵³ See 47 CFR part 96.

¹⁵⁴ See *Unlicensed Use of the 6 GHz Band; Expanding Flexible Use in Mid-Band Spectrum Between 3.7 and 24 GHz*, ET Docket No. 18-295 and GN Docket No. 17-183, Report and Order and Further Notice of Proposed Rulemaking, 35 FCC Rcd 3852, 3862-77, paras. 23-67 (2020).

71. If we implement a SAS-based authorization model in the band, we seek comment on how best to use the unique capabilities of the SASs to protect public safety users, authorize non-public safety operations, and mitigate potential interference between and among various tiers of users in the band. Most importantly, could a SAS protect public safety operations—including possible operations over potential nationwide interoperability spectrum—while providing meaningful access to the band for non-public safety users? We also seek comment on how implementing dynamic spectrum sharing in this band would impact public safety confidence in the band, particularly given the efforts discussed above to increase the visibility of public safety deployments in the band in order to enable protection and clear access rights.

72. We also seek comment on how public safety licensees could best be incorporated into a SAS-driven dynamic spectrum sharing regime while protecting the rights of public safety users and ensuring an interference-free operating environment. Specifically, should public safety licensees be required to inform the SAS of their operations, with the system protecting these operations by only permitting non-public safety use of other frequencies in the band? Or should the SAS also be responsible for assigning frequencies to public safety operations based on their needs? If the latter, to what extent and by what method should the SAS ensure priority and preemption for public safety operations? Should the SAS treat future public safety deployments differently than pre-existing deployments? Is a SAS managed model consistent with our earlier tentative conclusion that frequency coordination is in the public interest for this band? What, if any, requirements should we put in place to protect non-public safety operations from one another?

73. We note that the feasibility of dynamic sharing could depend on factors such as how intensely incumbents are currently using the spectrum, the types of existing services these incumbents are using (e.g., mobile vs. fixed), and the ability of dynamic sharing systems to register, detect, and coordinate existing systems. We seek comment on these and other characteristics in the 4.9 GHz band that would affect dynamic sharing, whether a dynamic spectrum sharing model is appropriate for this band, and, if so, what type of dynamic sharing is most appropriate. Commenters should also discuss the impacts of the different possible changes to the band that the Commission is considering as part of its efforts to standardize public safety operations and ensure greater visibility into deployments in order to provide greater protections for those operations, such as coordination requirements and a licensing database. How could a dynamic spectrum access system take advantage of those efforts?

74. Finally, we seek comment on whether to segment the 4.9 GHz band to enable non-public safety uses while also protecting public safety operations. Would combining such a segmentation of the band with a dynamic spectrum sharing system enable reliable spectrum access both for public safety operators and for non-public safety users, while also ensuring efficient use of spectrum that public safety is not actively using? For example, could we reserve some portion of the band for public safety use on a primary basis, and only permit non-public safety use of this portion via a dynamic spectrum sharing system, while making the remainder of the band available for non-public safety access? Could we grant public safety licensees some form of preemption rights, which would allow public safety access to the entire 4.9 GHz band in the case of an emergency, but limit public safety access to only a portion of the band at other times? If we do segment the band, should we require devices to be operable across the entire 4.9 GHz band, as we did in the 3.5 GHz band? Would segmenting the band—coupled with a band wide operability requirement—help to spur innovations in the equipment marketplace in the band to the benefit of public safety users?

c. Manual and Technical Sharing

75. Given the non-exclusive nature of 4.9 GHz band licenses, we seek comment on whether alternative methods of sharing are preferable to dynamic sharing. Would implementing licensing and technical rules be sufficient to enable non-public safety use without causing harmful interference to those public safety operations that would remain in the band? For example, we could require sensing capabilities for non-public safety equipment, or limit emissions to levels below that which could cause harmful interference to public safety operations. What would be the necessary requirements to allow for

purely technical protection measures? Would such limitations prevent the other benefits of opening this band to non-public safety use, such as fostering innovation and lowering equipment costs, from being realized? Such rules could be different for urban or rural areas, in recognition of the different uses of the band in those locations, as discussed above.

76. We seek comment on whether a frequency coordination requirement imposed on public safety operations, as discussed above, would enable similar requirements to be placed on non-public safety operations and thereby enable shared access. What requirements would we need to impose on non-public safety operations to enable full protection for public safety users, and what information would coordinators need from non-public safety operations to ensure such protection? Would we require non-public safety operators to modify their systems based on new public safety deployments, or only to protect incumbents at the time they deploy? What, if any, requirements should we put in place to protect non-public safety operations from one another?

2. Licensing Non-Public Safety Operations

77. In the event we determine that allowing non-public safety operations in the 4.9 GHz band is in the public interest, we will have to decide on the appropriate framework under which to authorize such operations. Below, we seek comment on a number of different licensing regimes which could be combined with one another and with the sharing regimes discussed above to create a comprehensive, nationwide framework for non-public safety operations in the band.

a. Non-Exclusive Licensed Access

78. We seek comment on allowing non-public safety users to access the band on a licensed, non-exclusive basis. Methods that have been used in other bands include: (1) traditional site-based Part 90 secondary licensing, such as in the PLMR bands;¹⁵⁵ (2) the “license light” licensing model used in the 3650-3700 MHz Service prior to its incorporation into the Citizens Broadband Radio Service;¹⁵⁶ and (3) the licensed-by-rule General Authorized Access (GAA) tier of the Citizens Broadband Radio Service.¹⁵⁷ Such approaches have been successfully used to make spectrum available to a wide variety of operators with relatively low barriers to entry vis-à-vis exclusive licensing models. Would a non-exclusive licensing approach be well-suited to the 4.9 GHz band? Could such an approach facilitate significant non-public safety use in the band while protecting important public safety operations? How should the system treat future public safety deployments, as opposed to incumbents? Could a non-exclusive licensing approach help to promote technological innovation in the band, including the equipment marketplace, to the benefit of public safety and non-public safety users? Commenters that support implementing a non-exclusive licensing model for non-public safety users in the band are encouraged to provide detailed proposals, including details on any sharing or authorization mechanism needed to facilitate such an approach.

b. Granting Exclusive Use Licenses

79. While exclusive use licenses are often the preferred method of allocating spectrum to commercial use, given the non-exclusive nature of existing public safety licenses, the ongoing importance of public safety operations in the band, and the fact that nearly all of the U.S. is covered by at least one

¹⁵⁵ The Commission’s rules define secondary operation as “[r]adio 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 CFR § 90.7.

¹⁵⁶ See 47 CFR part 90, subpart Z. Under this model, the Commission granted non-exclusive nationwide licenses to a wide variety of licensees. Licensees were required to register each base station location before beginning operations and to coordinate operations with other licensees with registered sites in the same geographic area.

¹⁵⁷ See 47 CFR part 96, subpart D. GAA users may only operate consistent with authorizations granted by a SAS, must not cause harmful interference to higher tier users in the band, and have no expectation of interference protection from other GAA users.

public safety license,¹⁵⁸ assigning such licenses in the 4.9 GHz band may prove to be a challenge.¹⁵⁹ But exclusive use licenses offer several important benefits, and, as such we seek comment on a variety of ways that exclusive use licenses could be utilized to facilitate non-public safety use in this band.

80. Would exclusive use licenses potentially increase current and future licensees' willingness to invest heavily in the band? Exclusive use licenses may be subject to mutually exclusive applications, which would be resolved by competitive bidding. Would this increase the likelihood that new licensees will be those entities that are most highly motivated to invest in the band? The Commission's competitive bidding systems generally facilitate the aggregation of licenses when it is economically efficient to do so. Would this make it more likely that licensees aggregating licenses in competitive bidding will invest in developing and deploying networks in this band? Given these potential benefits, we seek comment on whether this band is well-suited to exclusive use licensing and, if so, how to achieve it.

81. *Overlay Licensing.* Overlay licenses would grant new non-public safety entrants the right to use the band in ways that would not cause harmful interference to public safety users at any given time, but would be exclusive as to other non-public safety users. Such a licensing framework could be combined with different access models—including spectrum manager models, competitive bidding, and dynamic database-driven sharing models—and could be coupled with relocation or re-banding of some existing operations to increase the amount of spectrum available to the overlay licensee. This approach could provide the flexibility to allow new non-public safety operations in the band while safeguarding public safety users.

82. We seek comment on whether we should utilize overlay licenses to facilitate non-public safety use of the 4.9 GHz band. We also seek comment on how to assign such licenses and how to structure the rules governing them. How would an overlay license work in concert with potential new technical, interoperability, and coordination rules for public safety licensees that we seek comment on here? What technical or coordination rules would be required for non-public safety operations, as distinct from those required of public safety licensees? How would overlay licenses work with potential future public safety operations, as opposed to incumbents?

83. We also seek comment on the impact of this approach on use of the band. Would other users of the band spur innovation and expand the type, and lower the price, of 4.9 GHz equipment available to public safety entities? What types of entities should be eligible for overlay licenses? Would overlay licenses provide new licensees with sufficient spectrum access to justify investment in equipment and broadband and mobile applications?¹⁶⁰ If more spectrum access than is currently available is needed to motivate investment, can overlay licensees reasonably expect to obtain sufficient spectrum access by negotiation with incumbents? What conditions would be necessary for such negotiations to be successful? Is it possible that such access negotiations would both provide new overlay licensees with sufficient and reliable bandwidth while maintaining current incumbent operations? We seek comment on any other considerations regarding the use of overlay licensing for the 4.9 GHz band.¹⁶¹

84. *Exclusive Use Licenses for Specified Frequencies.* We seek comment on whether licenses providing exclusive use of specified frequencies, e.g., designated channels, would be more beneficial for the 4.9 GHz band than overlay licenses. Depending on the use of the band by underlying

¹⁵⁸ *Sixth Report & Order*, 36 FCC Rcd at 1961, para. 8 (noting that “most of the United States and U.S. territories are covered by at least one statewide license.”).

¹⁵⁹ See WISPA Sept. 17 *Ex Parte* at 2 (supporting an access model that “does not require exclusive licensing under Part 27 of the Commission’s rules”).

¹⁶⁰ We seek comment below on possible sharing between overlay licensees and public safety licensees.

¹⁶¹ We discuss below the interplay of the issuance of licenses for this band and our authority under the Communications Act to use competitive bidding to resolve mutually-exclusive applications. 47 U.S.C. § 309(j).

incumbent licensees, overlay licenses may not enable the use of uniform frequencies across geographic areas by new licensees. However, enabling the exclusive use of uniform frequencies likely would require any incumbent public safety operations using the frequencies to cease. We seek comment on possible mechanisms for relocation or repacking of such operations. We seek comment below on the use of an incentive auction model to enable this effort. But we similarly seek comment on any alternatives to relocate or repack public safety incumbents as needed.

85. What are the benefits and costs to this approach and how could it be implemented? How would licensing specified frequencies for exclusive use work in concert with other proposals to increase use of the band, such as the new technical and coordination rules for public safety operations or dynamic spectrum sharing, and which would it rule out?

c. Unlicensed Access

86. Unlicensed access allows a wide range of different users the ability to access spectrum, especially in rural or underserved areas and often at lower price points than through licensed services. This framework permits users to support innovative use cases and applications that can be tailored for each area, especially through Wi-Fi, Bluetooth, and other widely used technologies. Because the Commission permits unlicensed operations on a variety of spectrum bands, users are able to both match available capacity to their spectrum needs and choose the band(s) that are best suited to their particular coverage requirements. The Commission previously sought comment on unlicensed operations in this band.¹⁶² We recognize that both the demand for unlicensed spectrum and the unlicensed spectrum landscape have continued to evolve. We seek updated information on the potential use of the 4.9 GHz band for unlicensed access. To what extent is the band desirable for such use, given the presence of public safety incumbents and amount of spectrum available? What use cases could the 4.9 GHz band host? Is this band suitable to provide the types of applications users are demanding in terms of capacity and coverage requirements? Are there particular unlicensed applications and protocols that are well-suited for the 4.9 GHz band? We seek comment below on possible sharing mechanisms, which could operate in concert with unlicensed use, but what technical or licensing rules would be required in order to enable such use, regardless of sharing mechanism?

3. Other Considerations

87. *Technical Flexibility.* In the context of establishing a nationwide approach, we also seek comment on the feasibility of implementing different technical rules (e.g., maximum power levels) for the band to account for different public safety and non-public safety needs in different scenarios. We note that the record in this proceeding indicates that there may be varying use cases and opportunities for use in a nationwide framework. For example, public safety usage of the band is greater in urban areas than rural ones.¹⁶³ At the same time, there may be differences in non-public safety use of this band in rural areas, particularly to accommodate wireless broadband.¹⁶⁴ Would it be in the public interest to adopt

¹⁶² *Sixth Further Notice*, 33 FCC Rcd at 3290-91, para. 85.

¹⁶³ PSSA Dec. 29, 2020 Petition at 14 (explaining that spectrum is more valuable in densely populated areas); State of Maryland Department of Information Technology Comments, WP Docket No. 07-100, at 9 (rec. Jan. 12, 2021) (“There are some states with rural and poorly populated areas that may never use the 4.9 GHz or other midband spectrum”) (Maryland DoIT Jan. 12, 2021 Comments); IAFC Jan. 12, 2021 Comments at 2 (stating that major cities such as New York City and Los Angeles have licenses in the band); New York State Division of Homeland Security and Emergency Services Comments, WP Docket No. 07-100, at 1-2 (rec. Jan. 14 2021) (explaining how New York City heavily utilizes the band for public safety purposes); Grundy County JETSB Dec. 31, 2020 Comments at 11 (indicating that the Emergency Communications Center footprint is growing and requires more connectivity support especially in rural communities).

¹⁶⁴ Maryland DoIT Jan. 12, 2021 Comments at 9; Government Wireless Technology & Communications Association Reply, WP Docket No. 07-100, at 4 (rec. Feb. 12, 2021) (explaining that within states there could be a variety of geographic public safety and non-public safety usage differences); WISPA Jan. 13, 2021 Comments at 3 (the band is “useful to WISPs that need access to more spectrum to serve rural Americans”).

flexibility in the technical rules for the 4.9 GHz band to accommodate these different needs, consistent with our decision to pursue an integrated, nationwide approach to the band? For example, in other proceedings we have adopted different power levels for urban and rural deployments.¹⁶⁵ Should we take a similar approach here as part of a nationwide framework?¹⁶⁶ Would this approach help foster efficient use, encourage innovation, and improve the equipment marketplace for the band? How would we define the different areas within our nationwide framework, and how would we ensure these definitions remain up-to-date as use of the band evolves?

88. *Incentive Auction.* In addition to its standard authority to conduct competitive bidding to assign licenses, the Commission has statutory authority to conduct incentive auctions, in which it offers incumbent licensees a share of the proceeds from the auction of new licenses made available by the incumbents relinquishing their spectrum usage rights.¹⁶⁷ Should the Commission consider an incentive auction to encourage public safety licensees to relocate their operations (or modify them in some way to reduce the amount of spectrum they require) in order to enable greater non-public safety use of the band? How would we structure an incentive auction within the Commission's existing statutory authority that would result in enough clear spectrum to attract new licensees and serve the public interest? What alternate options are available to public safety licensees which accept incentive auction payments? Would the current 4.9 GHz licensees, many of which are governmental entities, be legally or practically equipped to participate in the reverse phase of an incentive auction? Would their incentives align with the public interest? How would we have to modify our incentive auction structure here, given the non-exclusive rights of the current licensees? Should any incumbent public safety licensees choosing not to participate in the incentive auction be required to be repacked into a portion of the band or otherwise modify their operations to enable coexistence with new non-public safety licensees? What is the likelihood that enough existing licensees would be willing to relinquish their spectrum usage rights so that the Commission then could offer enough new licenses to stimulate investment in the band?

89. *Digital Equity and Inclusion.* Finally, the Commission, as part of its continuing effort to advance digital equity for all,¹⁶⁸ including people of color, persons with disabilities, persons who live in rural or Tribal areas, and others who are or have been historically underserved, marginalized, or adversely affected by persistent poverty or inequality, invites comment on any equity-related considerations¹⁶⁹ and benefits (if any) that may be associated with the proposals and issues discussed

¹⁶⁵ See *Service Rules for the 698-746, 747-762 and 777-792 MHz Bands et al.*, Report and Order and Further Notice of Proposed Rulemaking, WT Docket No. 06-150 et al., 22 FCC Rcd 8064, 8097-98, 8099-101, paras. 89, 93 (2007) (permitting higher power levels in rural areas to provide greater operational flexibility); *Unlicensed White Space Device Operations in the Television Bands*, ET Docket No. 20-36, Report and Order and Further Notice of Proposed Rulemaking, 35 FCC Rcd 12603, 12606, para. 9 (2020) (increasing the maximum permissible radiated power from 10 to 16 watts EIRP and the maximum permissible antenna HAAT from 250 meters to 500 meters in "less congested" areas); *Facilitating Shared Use in the 3100-3550 MHz Band*, WT Docket No. 19-348, Second Report and Order, Order on Reconsideration, and Order of Proposed Modification, 36 FCC Rcd 5987, 6014, para. 70 (2021) (adopting new rules to permit base stations in rural areas to operate with double the non-rural EIRP limit, with a maximum of 3280 watts per megahertz for the 3.45 GHz service, consistent with other broadband mobile services in nearby bands (e.g., AWS-1, AWS-3, and AWS-4, PCS, and 3.7 GHz)).

¹⁶⁶ See, e.g., 47 CFR § 27.50 (b), (c), (d), (j), and (k) (permitting higher radiated power levels in counties with low population densities).

¹⁶⁷ 47 U.S.C. § 309(j)(8)(G).

¹⁶⁸ Section 1 of the Communications Act of 1934 as amended provides that the FCC "regulat[es] interstate and foreign commerce in communication by wire and radio so as to make [such service] available, so far as possible, to all the people of the United States, without discrimination on the basis of race, color, religion, national origin, or sex." 47 U.S.C. § 151.

¹⁶⁹ The term "equity" is used here consistent with Executive Order 13985 as the consistent and systematic fair, just, and impartial treatment of all individuals, including individuals who belong to underserved communities that have been denied such treatment, such as Black, Latino, and Indigenous and Native American persons, Asian Americans

(continued...)

herein. Specifically, we seek comment on how our proposals may promote or inhibit advances in diversity, equity, inclusion, and accessibility, as well the scope of the Commission’s relevant legal authority.

V. PROCEDURAL MATTERS

90. *Paperwork Reduction Act Analysis.* This *Eighth Further Notice of Proposed Rulemaking* may contain new or modified information collection(s) subject to the Paperwork Reduction Act of 1995.¹⁷⁰ If the Commission adopts any new or modified information collection requirements, they will be submitted to the Office of Management and Budget (OMB) for review under section 3507(d) of the PRA. OMB, the general public, and other federal agencies are invited to comment on the new or modified information collection requirements contained in this proceeding. In addition, pursuant to the Small Business Paperwork Relief Act of 2002,¹⁷¹ we seek specific comment on how we might “further reduce the information collection burden for small business concerns with fewer than 25 employees.”¹⁷²

91. *Regulatory Flexibility Act.* The Regulatory Flexibility Act of 1980, as amended (RFA),¹⁷³ requires that an agency prepare a regulatory flexibility analysis for notice and comment rulemakings, unless the agency certifies that “the rule will not, if promulgated, have a significant economic impact on a substantial number of small entities.”¹⁷⁴ Accordingly, the Commission has prepared an Initial Regulatory Flexibility Analysis (IRFA) concerning potential rule and policy changes contained in this *Eighth Further Notice of Proposed Rulemaking*. The IRFA is contained in Appendix C.

92. *Final Regulatory Flexibility Certification.* Pursuant to Section 605(b) of the RFA, if a proposed or final rule, “. . . will not, if promulgated, have a significant economic impact on a substantial number of small entities[,]”¹⁷⁵ an agency is permitted to file a certification with the rulemaking containing a statement that provides a factual basis for its conclusion that there will not be significant economic impact on a substantial number of small entities.¹⁷⁶ The certification and statement must be filed in the Federal Register and sent to the Chief Counsel for Advocacy of the Small Business Administration (SBA).¹⁷⁷ The *Order on Reconsideration* in this proceeding grants in part the petitions for

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and Pacific Islanders and other persons of color; members of religious minorities; lesbian, gay, bisexual, transgender, and queer (LGBTQ+) persons; persons with disabilities; persons who live in rural areas; and persons otherwise adversely affected by persistent poverty or inequality. *See* Exec. Order No. 13985, 86 Fed. Reg. 7009, Executive Order on Advancing Racial Equity and Support for Underserved Communities Through the Federal Government (January 20, 2021).

¹⁷⁰ Pub. L. No. 104-13.

¹⁷¹ Pub. L. No. 107-198.

¹⁷² 44 U.S.C. § 3506(c)(4).

¹⁷³ 5 U.S.C. § 603. The RFA, 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).

¹⁷⁴ 5 U.S.C. § 605(b). 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 U.S.C. § 601(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, 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). In addition, the term “small business” has the same meaning as the term “small business concern” under the Small Business Act. 15 U.S.C. § 632. A small business concern is one which: (1) is independently owned and operated; (2) is not dominant in its field of operation; and (3) satisfies any additional criteria established by the SBA. *See* 5 U.S.C. §§ 601-612.

¹⁷⁵ 5 U.S.C. § 605(b).

¹⁷⁶ *Id.*

reconsideration of the *Sixth Report and Order*, in WP Docket No. 07-100, reverting back to the rules that were in effect prior to modification by the *Sixth Report and Order*. No petitions for reconsideration of the Final Regulatory Flexibility Analysis (FRFA) that accompanied the *Sixth Report and Order* were received by the Commission.¹⁷⁸ Accordingly, the Commission has prepared a Final Regulatory Flexibility Certification (FRFC) providing the factual basis for its determination that the *Order on Reconsideration* will not have significant economic impact on a substantial number of small entities. The Commission will publish a copy of the *Order on Reconsideration* and the FRFC in the Federal Register and send a copy to the Chief Counsel for Advocacy of the Small Business Administration (SBA).¹⁷⁹ The FRFC is set forth in Appendix B.

93. *Congressional Review Act.* The Commission has determined, and the Administrator of the Office of Information and Regulatory Affairs, Office of Management and Budget, concurs, that this rule is non-major under the Congressional Review Act, 5 U.S.C. § 804(2). The Commission will send a copy of the *Order on Reconsideration* in a report to be sent to Congress and the Government Accountability Office pursuant to 5 U.S.C. § 801(a)(1)(A).

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

95. *Comment Period and Filing Procedures.* 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. Comments may be filed using the Commission’s Electronic Comment Filing System (ECFS). *See Electronic Filing of Documents in Rulemaking Proceedings*, 63 FR 24121 (1998). Commenters should refer to WP Docket No. 07-100 when filing in response to this *Eighth Further Notice of Proposed Rulemaking*.

- Electronic filers: Comments may be filed electronically using the Internet by accessing the ECFS: <http://apps.fcc.gov/ecfs/>.
- Paper filers: Parties who choose to file by paper must file an original and one copy of each filing.

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¹⁷⁷ *Id.*

¹⁷⁸ *Sixth Report and Order*, 36 FCC Rcd at 1994-2001, Appendix D.

¹⁷⁹ *See* 5 U.S.C. § 605(b).

- All filings must be addressed to the Commission’s Secretary, Office of the Secretary, Federal Communications Commission.
 - Commercial overnight mail (other than U.S. Postal Service Express Mail and Priority Mail) must be sent to 9050 Junction Drive, Annapolis Junction, MD 20701.
 - U.S. Postal Service first-class, Express, and Priority mail must be addressed to 45 L St NE, Washington, DC 20554.
- Effective March 19, 2020, and until further notice, the Commission no longer accepts any hand or messenger delivered filings. This is a temporary measure taken to help protect the health and safety of individuals, and to mitigate the transmission of COVID-19. *See FCC Announces Closure of FCC Headquarters Open Window and Change in Hand-Delivery Policy*, Public Notice, DA 20-304 (March 19, 2020), <https://www.fcc.gov/document/fcc-closes-headquarters-open-window-and-changes-hand-delivery-policy>.
 - During the time the Commission’s building is closed to the general public and until further notice, if more than one docket or rulemaking number appears in the caption of a proceeding, paper filers need not submit two additional copies for each additional docket or rulemaking number; an original and one copy are sufficient.
 - After COVID-19 restrictions are lifted, the Commission has established that hand-carried documents are to be filed at the Commission’s office located at 9050 Junction Drive, Annapolis Junction, MD 20701. This will be the only location where hand-carried paper filings for the Commission will be accepted.¹⁸⁰

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

97. *Additional Information.* For additional information on this proceeding, contact Jon Markman of the Wireless Telecommunications Bureau, Mobility Division, at (202) 418-7090 or Jonathan.Markman@fcc.gov or Thomas Eng of the Public Safety and Homeland Security Bureau at (202) 418-0019 or Thomas.Eng@fcc.gov.

VI. ORDERING CLAUSES

98. Accordingly, IT IS ORDERED, pursuant to the authority found in sections 4(i), 4(j), 302, 303(b), 303(f), 303(g), 303(r), 309(j) and 405 of the Communications Act of 1934, as amended, 47 U.S.C. §§ 154(i), 154(j), 302a, 303(b), 303(f), 303(g), 303(r), 309(j), and 405, as well as Section 1.429 of the Commission’s rules, 47 CFR § 1.429, that this *Order on Reconsideration and Eighth Further Notice of Proposed Rulemaking* IS HEREBY ADOPTED.

99. IT IS FURTHER ORDERED that the Petitions for Reconsideration filed by the Public Safety Spectrum Alliance, APCO International, and the National Public Safety Telecommunications Council, ARE GRANTED to the extent specified herein.

100. IT IS FURTHER ORDERED that the Public Safety and Homeland Security Bureau and the Wireless Telecommunications Bureau SHALL MODIFY the freeze on acceptance and processing of applications for the 4.9 GHz band as specified herein.

¹⁸⁰ See *Amendment of the Commission’s Rules of Practice and Procedure*, Order, 35 FCC Rcd 5450 (OMD 2020).

101. IT IS FURTHER ORDERED, pursuant to section 1.103 of the Commission's rules, 47 CFR § 1.103, that the amendments to the Commission's rules as set forth in Appendix A hereof ARE ADOPTED, effective thirty (30) days from the date of the publication of this *Order on Reconsideration* in the Federal Register.

102. IT IS FURTHER ORDERED that, pursuant to applicable procedures set forth in sections 1.415 and 1.419 of the Commission's Rules, 47 CFR §§ 1.415, 1.419, interested parties may file comments on the *Eighth Further Notice of Proposed Rulemaking* on or before 30 days after publication in the Federal Register, and reply comments on or before 60 days after publication in the Federal Register.

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

104. IT IS FURTHER ORDERED that the Office of the Managing Director, Performance Evaluation and Records Management, SHALL SEND a copy of this *Order on Reconsideration* in a report to be sent to Congress and the Government Accountability Office pursuant to the Congressional Review Act, 5 U.S.C. § 801(a)(1)(A).

FEDERAL COMMUNICATIONS COMMISSION

Marlene H. Dortch
Secretary

APPENDIX A**Final Rules**

The Federal Communications Commission amends 47 CFR parts 1 and 90 to read as follows:

PART 1 – PRACTICE AND PROCEDURE

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

AUTHORITY: 47 U.S.C. ch. 2, 5, 9, 13; 28 U.S.C. 2461, unless otherwise noted.

2. Amend § 1.9001 by revising paragraph (b) to read as follows and by removing paragraph (c):

§ 1.9001 Purpose and scope.

* * * * *

(b) Licensees holding exclusive use rights are permitted to engage in spectrum leasing whether their operations are characterized as commercial, common carrier, private, or non-common carrier.

3. Amend § 1.9005 by removing and reserving paragraph (oo).

§ 1.9005 Included services.

* * * * *

4. Revise § 1.9048 to read as follows:

§ 1.9048 Special provisions relating to spectrum leasing arrangements involving licensees in the Public Safety Radio Services.

Licensees in the Public Safety Radio Services (see part 90, subpart B, and § 90.311(a)(1)(i) of this chapter) may enter into spectrum leasing arrangements with other public safety entities eligible for such a license authorization as well as with entities providing communications in support of public safety operations (see § 90.523(b) of this chapter).

PART 90 – PRIVATE LAND MOBILE RADIO SERVICES

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

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

6. Revise § 90.1203 by revising paragraph (b) to read as follows and by removing paragraph (c):

§ 90.1203 Eligibility.

* * * * *

(b) 4.9 GHz band licensees may enter into sharing agreements or other arrangements for use of the spectrum with entities that do not meet the eligibility requirements in this section. However, all applications in the band are limited to operations in support of public safety.

7. Remove § 90.1217.

§ 90.1217 [Removed]

APPENDIX B

Final Regulatory Flexibility Certification

1. The Regulatory Flexibility Act of 1980, as amended (RFA),¹ requires that a regulatory flexibility analysis be prepared for rulemaking proceedings, unless the agency certifies that “the rule will not, if promulgated, have a significant economic impact on a substantial number of small entities.”² The RFA generally defines “small entity” as having the same meaning as the terms “small business,” “small organization,” and “small governmental jurisdiction.”³ In addition, the term “small business” has the same meaning as the term “small business concern” under the Small Business Act.⁴ 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).⁵

2. In the *Order on Reconsideration* the Commission addresses petitions for reconsideration of the rules adopted in the *Sixth Report and Order and Seventh Further Notice of Proposed Rulemaking* adopted on September 30, 2020, establishing a new leasing framework for the 4.9 GHz band where states through a single statewide entity, a State Lessor, had the ability to facilitate access for public safety and non-public safety, and commercial and private uses, by state and local entities in their jurisdictions.⁶ Pursuant to a May 27, 2021, Commission order granting a petition to stay⁷ the implementation of the new leasing framework adopted in the *Sixth Report and Order* which had not yet become effective, the State Lessor framework did not go into effect, and the entire leasing framework adopted in the *Sixth Report and Order* was held in abeyance until the Commission issues a decision on the petitions for reconsideration filed in this proceeding.⁸

¹ See 5 U.S.C. § 603. The RFA, 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 5 U.S.C. § 605(b).

³ *Id.* § 601(6).

⁴ *Id.* § 601(3) (incorporating by reference the definition of “small business concern” in 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 Small Business Act, 15 U.S.C. § 632.

⁶ *Amendment of Part 90 of the Commission’s Rules*, WP Docket No. 07-100, Sixth Report and Order and Seventh Further Notice of Proposed Rulemaking, 36 FCC Rcd 1958 (2020) (*Sixth Report and Order*).

⁷ Petition for Stay, Public Safety Spectrum Alliance, WP Docket No. 07-100 (filed Dec. 29, 2020) https://ecfsapi.fcc.gov/file/1229024403423/PSSA-Petition%20for%20Stay_4.9Ghz_Dec292020%20-%20FINAL.pdf.

⁸ *Amendment of Part 90 of the Commission’s Rules*, WP Docket No. 07-100, Order, FCC 21-66, at 2-4, paras. 5-11 (May 27, 2021); see also Petition for Reconsideration of the Public Safety Spectrum Alliance, WP Docket No. 07-100 (filed Dec. 29, 2020), https://ecfsapi.fcc.gov/file/1229129648687/PSSA-PetitionForReconsideration_4.9GHz_Dec292020-FINAL.pdf (PSSA Dec. 29, 2020 Petition); Petition for Reconsideration of APCO International, WP Docket No. 07-100 (filed Dec. 30, 2020), <https://ecfsapi.fcc.gov/file/12292482323692/APCO%20Petition%20for%20Reconsideration%20-%204.9%20GHz%20-%20Dec%202020.pdf> (APCO Dec 30, 2020 Petition); Petition for Reconsideration By the National Public Safety Telecommunications Council, WP Docket No. 07-100 (filed Dec. 30, 2020), https://ecfsapi.fcc.gov/file/1230119184650/NPSTC_Petition_for_Recon_6th_RandO_4.9GHz_12.30.2020%20FIN AL.pdf (NPSTC Dec. 30, 2020 Petition).

3. The Commission vacates and deletes the rules adopted in *Sixth Report and Order* in the *Order on Reconsideration*. In so doing, we remove any potential burdens associated with the rules adopted in the *Sixth Report and Order* that would have required reporting, recordkeeping, or other compliance obligations for licensees of the 4.9 GHz band, and do not create any new burdens in the process. The Commission also lifts the licensing freeze pursuant to the Bureaus' September 8, 2020, *Freeze Public Notice*, for incumbents wishing to modify their existing licenses or license new permanent fixed sites.⁹ The lifting of the freeze does not apply to potential applicants who are not already 4.9 GHz licensees.¹⁰ Only existing 4.9 GHz licensees can modify licenses as permitted under the Commission's rules.

4. We have determined that the impact on the entities affected by the rule change will not be significant because the *Order on Reconsideration* is not adopting any new rules or rescinding any rules that became effective as a result of the *Sixth Report and Order*. Thus, the Commission's actions have not created any new obligations. Small and other entities will simply be required to comply with the rules that were in place prior to the *Sixth Report and Order*. Accordingly, we therefore certify that the requirements of the *Order on Reconsideration* will not have a significant economic impact on a substantial number of small entities.

5. The Commission will send a copy of the *Order on Reconsideration and Eighth Further Notice of Proposed Rulemaking*, including a copy of this Final Regulatory Flexibility Certification, in a report to Congress pursuant to the Congressional Review Act.¹¹ In addition, the *Order on Reconsideration and Eighth Further Notice*, and this final certification, will be sent to the Chief Counsel for Advocacy of the SBA, and will be published in the Federal Register.¹²

⁹ *Public Safety and Homeland Security Bureau and Wireless Telecommunications Bureau Announce Temporary Filing Freeze on the Acceptance and Processing of Certain Part 90 Applications for the 4940-4990 MHz Band*, WP Docket No. 07-100, Public Notice, 35 FCC Rcd 9522 (PSHSB/WTB 2020) (*Freeze Public Notice*). There is currently a freeze in place that no new or modified applications for 4.9 GHz band licenses are being accepted or processed by the Commission.

¹⁰ See NPSTC Dec. 30, 2020 Petition at 4-5, 7 (asserting that public safety agencies that did not hold a license prior to the *Freeze Public Notice* have lost the right to apply for a new license with a reasonable expectation that the license would be granted).

¹¹ See 5 U.S.C. § 801(a)(1)(A).

¹² See 5 U.S.C. § 605(b).

APPENDIX C

Initial Regulatory Flexibility Analysis

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

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

2. In the *Eighth Further Notice*, we seek comment on a nationwide framework to encourage greater use and improved spectrum efficiency of the 4940-4990 MHz (4.9 GHz) band. We seek comment to implement changes to our policies and regulations that promote optimal use, innovation, and investment. The *Fifth Further Notice of Proposed Rulemaking* and *Sixth Further Notice of Proposed Rulemaking* in this proceeding enabled 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, and standards.⁴ The *Sixth Report and Order and Seventh Further Notice of Proposed Rulemaking*, however, sought to establish a new framework to expand access to the band by providing states the opportunity to lease 4.9 GHz band spectrum to commercial entities, critical infrastructure industry, including electric utilities, and other stakeholders. In addition, the *Seventh Further Notice* sought comment on new state-based licensing regime for public safety operations in the 4.9 GHz band, including a centralized structure of state oversight and coordination of public safety operations in the band.⁵

3. In the *Eighth Further Notice*, we revisit the structure of the 4.9 GHz band to promote public safety use and encourage a robust market for equipment. Specifically, we focus on establishing a nationwide framework that will avoid breaking up the 4.9 GHz band into a patchwork of state leases. We believe that a nationwide approach will promote robust equipment market, lower costs, and increase the likelihood of interoperable communications and consistent interference protection. To achieve this vision, we seek comment on establishing a database with consistent and reliable information about what spectrum is available where or how it is being used—providing certainty and predictability to plan and invest in 4.9 GHz deployments. Further, we seek comment on certain prominent proposals from the *Sixth Further Notice*, such as Universal Licensing System (ULS) information submissions, non-public safety access, dynamic spectrum sharing, and frequency coordination in the 4.9 GHz band, as well as on several other Commission proposals involving technical rule changes to increase utilization of the 4.9 GHz band

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

² See 5 U.S.C. § 603(a).

³ See *Id.*

⁴ *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, 27 FCC Rcd 6577 (2012) (*Fifth Further Notice*); *Amendment of Part 90 of the Commission's Rules*, WP Docket No. 07-100, Sixth Further Notice of Proposed Rulemaking, 33 FCC Rcd at 3262, para. 2 (2018) (*Sixth Further Notice*).

⁵ *Amendment of Part 90 of the Commission's Rules*, WP Docket No. 07-100, Sixth Report and Order and Seventh Further Notice of Proposed Rulemaking, 36 FCC Rcd 1958 (2020) (*Seventh Further Notice*).

and we incorporate these proposals by reference into the *Eighth Further Notice*.⁶ We believe that by implementing a nationwide framework that reflects public safety input, we can ensure that public safety continues to be prioritized in the band while opening up the band to additional uses that will facilitate increased usage and encourage a more robust market for equipment and greater innovation, and at the same time protect against harmful interference.

B. Legal Basis

4. The proposed action is authorized pursuant to Sections 1, 4(i), 4(j), 4(o), 301, 303(b), 303(g), 303(r), 316, 332, and 403 of the Communications Act of 1934, as amended, 47 U.S.C. §§ 151, 154(i), 154(j), 154(o), 301, 303(b), 303(g), 303(r), 316, 332, and 403.

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

5. The RFA directs agencies to provide a description of, and, where feasible, an estimate of the number of small entities that may be affected by the proposed rules and policies, if adopted.⁷ The RFA generally defines the term “small entity” as having the same meaning as the terms “small business,” “small organization,” and “small governmental jurisdiction.”⁸ In addition, the term “small business” has the same meaning as the term “small business concern” under the Small Business Act.⁹ A “small business concern” is one which: (1) is independently owned and operated; (2) is not dominant in its field of operation; and (3) satisfies any additional criteria established by the SBA.¹⁰

6. *Small Businesses, Small Organizations, Small Governmental Jurisdictions.* Our actions, over time, may affect small *entities* that are not easily categorized at present. We therefore describe here, at the outset, three broad groups of small entities that could be directly affected herein.¹¹ First, while there are industry specific size standards for small businesses that are used in the regulatory flexibility analysis, according to data from the SBA’s Office of Advocacy, in general a small business is an independent business having fewer than 500 employees.¹² These types of small businesses represent 99.9% of all businesses in the United States which translates to 30.7 million businesses.¹³

7. Next, the type of small entity described as a “small organization” is generally “any not-for-profit enterprise which is independently owned and operated and is not dominant in its field.”¹⁴ The Internal Revenue Service (IRS) uses a revenue benchmark of \$50,000 or less to delineate its annual electronic filing requirements *for* small exempt organizations.¹⁵ Nationwide, for tax year 2018, there

⁶ *Sixth Further Notice*, 33 FCC Rcd at 3277-83, paras. 45-63.

⁷ 5 U.S.C. § 603(b)(3).

⁸ *See id.* § 601(6).

⁹ *See id.* § 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.”

¹⁰ 15 U.S.C. § 632.

¹¹ *See* 5 U.S.C. § 601(3)-(6).

¹² *See* SBA, Office of Advocacy, “What’s New With Small Business?”, <https://cdn.advocacy.sba.gov/wp-content/uploads/2019/09/23172859/Whats-New-With-Small-Business-2019.pdf> (Sept 2019).

¹³ *Id.*

¹⁴ 5 U.S.C. § 601(4).

¹⁵ The IRS benchmark is similar to the population of less than 50,000 benchmark in 5 U.S.C § 601(5) that is used to define a small governmental jurisdiction. Therefore, the IRS benchmark has been used to estimate the number small

(continued....)

were approximately 571,709 small exempt organizations in the U.S. reporting revenues of \$50,000 or less according to the registration and tax data for exempt organizations available from the IRS.¹⁶

8. Finally, the small entity described as a “small governmental jurisdiction” is defined generally as “governments of cities, counties, towns, townships, villages, school districts, or special districts, with a population of less than fifty thousand.”¹⁷ U.S. Census Bureau data from the 2017 Census of Governments¹⁸ indicate that there were 90,075 local governmental jurisdictions consisting of general purpose governments and special purpose governments in the United States.¹⁹ Of this number there were 36,931 general purpose governments (county²⁰, municipal and town or township²¹) with populations of less than 50,000 and 12,040 special purpose governments - independent school districts²² with enrollment populations of less than 50,000.²³ Accordingly, based on the 2017 U.S. Census of Governments data, we

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organizations in this small entity description. See Annual Electronic Filing Requirement for Small Exempt Organizations — Form 990-N (e-Postcard), “Who must file,” <https://www.irs.gov/charities-non-profits/annual-electronic-filing-requirement-for-small-exempt-organizations-form-990-n-e-postcard>. We note that the IRS data does not provide information on whether a small exempt organization is independently owned and operated or dominant in its field.

¹⁶ See Exempt Organizations Business Master File Extract (EO BMF), “CSV Files by Region,” <https://www.irs.gov/charities-non-profits/exempt-organizations-business-master-file-extract-eo-bmf>. The IRS Exempt Organization Business Master File (EO BMF) Extract provides information on all registered tax-exempt/non-profit organizations. The data utilized for purposes of this description was extracted from the IRS EO BMF data for Region 1-Northeast Area (76,886), Region 2-Mid-Atlantic and Great Lakes Areas (221,121), and Region 3-Gulf Coast and Pacific Coast Areas (273,702) which includes the continental U.S., Alaska, and Hawaii. This data does not include information for Puerto Rico.

¹⁷ 5 U.S.C. § 601(5).

¹⁸ See 13 U.S.C. § 161. The Census of Governments survey is conducted every five (5) years compiling data for years ending with “2” and “7”. See also Census of Governments, <https://www.census.gov/programs-surveys/cog/about.html>.

¹⁹ See U.S. Census Bureau, 2017 Census of Governments – Organization Table 2. Local Governments by Type and State: 2017 [CG1700ORG02], <https://www.census.gov/data/tables/2017/econ/gus/2017-governments.html>. Local governmental jurisdictions are made up of general purpose governments (county, municipal and town or township) and special purpose governments (special districts and independent school districts). See also Table 2. CG1700ORG02 Table Notes_Local Governments by Type and State_2017.

²⁰ See U.S. Census Bureau, 2017 Census of Governments - Organization, Table 5. County Governments by Population-Size Group and State: 2017 [CG1700ORG05]. <https://www.census.gov/data/tables/2017/econ/gus/2017-governments.html>. There were 2,105 county governments with populations less than 50,000. This category does not include subcounty (municipal and township) governments.

²¹ See U.S. Census Bureau, 2017 Census of Governments - Organization, Table 6. Subcounty General-Purpose Governments by Population-Size Group and State: 2017 [CG1700ORG06]. <https://www.census.gov/data/tables/2017/econ/gus/2017-governments.html>. There were 18,729 municipal and 16,097 town and township governments with populations less than 50,000.

²² See U.S. Census Bureau, 2017 Census of Governments - Organization, Table 10. Elementary and Secondary School Systems by Enrollment-Size Group and State: 2017 [CG1700ORG10]. <https://www.census.gov/data/tables/2017/econ/gus/2017-governments.html>. There were 12,040 independent school districts with enrollment populations less than 50,000. See also Table 4. Special-Purpose Local Governments by State Census Years 1942 to 2017 [CG1700ORG04], CG1700ORG04 Table Notes Special Purpose Local Governments by State Census Years 1942 to 2017.

²³ While the special purpose governments category also includes local special district governments, the 2017 Census of Governments data does not provide data aggregated based on population size for the special purpose governments category. Therefore, only data from independent school districts is included in the special purpose governments category.

estimate that at least 48,971 entities fall into the category of “small governmental jurisdictions.”²⁴

9. *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 closest applicable SBA category is Wireless Telecommunications Carriers (except Satellite) which encompasses business entities engaged in *radiotelephone communications*.²⁵ The appropriate size standard for this category under SBA rules is that such a business is small if it has 1,500 or fewer employees.²⁶ For this industry, U.S. Census Bureau data for 2012 shows that there were 967 firms that operated for the entire year.²⁷ Of this total, 955 firms had employment of 999 or fewer employees and 12 had employment of 1000 employees or more.²⁸ Thus under this category and the associated size standard, the Commission estimates that the majority of PLMR licensees are small entities.

10. According to the Commission’s records, a total of approximately 393,490 licenses comprise PLMR users.²⁹ Of this number there are a total of 3,541 PLMR licenses in the 4.9 GHz band.³⁰ The Commission does not require PLMR licensees to disclose information about number of employees, and does not have information that could be used to determine how many PLMR licensees constitute small entities under this definition. The Commission however believes that a substantial number of PLMR licensees may be small entities despite the lack of specific information.

11. *Frequency Coordinators.* Neither the Commission nor the SBA has developed a small business size standard specifically applicable to spectrum frequency coordinators. The closest applicable SBA category is Business Associations which comprises establishments primarily engaged in promoting the business interests of their members.³¹ The SBA has developed a small business size standard for “Business Associations,” which consists of all such firms with gross annual receipts of \$7.5 million or less.³² For this category, U.S. Census Bureau data for 2012 shows that there were 14,996 firms that

²⁴ This total is derived from the sum of the number of general-purpose governments (county, municipal and town or township) with populations of less than 50,000 (36,931) and the number of special purpose governments - independent school districts with enrollment populations of less than 50,000 (12,040), from the 2017 Census of Governments - Organizations Tables 5, 6, and 10.

²⁵ See U.S. Census Bureau, *2017 NAICS Definition*, “517312 Wireless Telecommunications Carriers (except Satellite),” <https://www.census.gov/naics/?input=517312&year=2017&details=517312>.

²⁶ See 13 CFR § 121.201, NAICS Code 517312 (formerly 517210).

²⁷ See U.S. Census Bureau, *2012 Economic Census of the United States*, Table ID EC1251SSSZ5, *Information: Subject Series, Estab and Firm Size: Employment Size of Firms for the U.S.: 2012*, NAICS Code 517210”, <https://data.census.gov/cedsci/table?text=EC1251SSSZ5&n=517210&tid=ECNSIZE2012.EC1251SSSZ5&hidePreview=false&vintage=2012>.

²⁸ *Id.* The available U.S. Census Bureau data does not provide a more precise estimate of the number of firms that meet the SBA size standard.

²⁹ This figure was derived from Commission licensing records as of July 28, 2021. 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 fewer than 1,500 employees.

³⁰ Based on an FCC Universal Licensing System search of September 13, 2021. Search parameters: Radio Service = PA – Public Safety 4940-4990 MHz Band; Authorization Type = Regular; Status = Active.

³¹ See U.S. Census Bureau, *2017 NAICS Definition*, “813910 Business Associations,” <https://www.census.gov/naics/?input=813910&year=2017&details=813910>.

³² 13 CFR § 121.201, NAICS Code 813910.

operated for the entire year.³³ Of these firms, a total of 14,229 had gross annual receipts of less than \$5 million and 396 firms had gross annual receipts of \$5 million to \$9,999,999.³⁴

12. There are 13 entities certified to perform frequency coordination functions under Part 90 of the Commission's rules.³⁵ According to U. S. Census Bureau data approximately 95% of business associations have gross annual receipts of \$7.5 million or less and would be classified as small entities. The Business Associations category is very broad however, and does not include specific figures for firms that are engaged in frequency coordination. Thus, the Commission is unable to ascertain exactly how many of the frequency coordinators are classified as small entities under the SBA size standard.³⁶ Therefore, for purposes of this IRFA under the associated SBA size standard, the Commission estimates that a majority of the 13 FCC-certified frequency coordinators are small.

13. *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, "[NRPC] is an advocacy body formed in 2007 that supports public safety communications spectrum management by [the RPCs] in the 700 MHz and 800 MHz NPSPAC public safety spectrum as required by the Federal Communications Commission."³⁷ The NRPC states that RPCs "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."³⁸ According to Commission data, there are 55 RPCs.³⁹ The Commission has not developed a small business size standard specifically applicable to RPCs and the NRPC. The closest applicable industry with a SBA small business size standard is Wireless Telecommunications Carriers (except Satellite) which encompasses business entities engaged in radiotelephone communications.⁴⁰ Under the SBA small business size standard, a business employing no more than 1,500 persons is considered small.⁴¹ For this industry, U.S. Census Bureau data for 2012 shows that there were 967 firms that operated for the entire year.⁴² Of this total, 955 firms had

³³ See U.S. Census Bureau, *2012 Economic Census of the United States*, Table ID: EC1281SSSZ4, *Other Services (Except Public Administration): Subject Series - Estab and Firm Size: Receipts/Revenue Size of Firms for the U.S.: 2012*, NAICS Code 813910, <https://data.census.gov/cedsci/table?text=EC1281SSSZ4&tid=ECNSIZE2012.EC1281SSSZ4&hidePreview=false&vintage=2012>.

³⁴ *Id.* The available U.S. Census Bureau data does not provide a more precise estimate of the number of firms that meet the SBA size standard.

³⁵ The Commission's records indicate that there are currently 13 frequency coordinators that would be affected by this rulemaking. See <https://www.fcc.gov/wireless/bureau-divisions/mobility-division/industrial-business/industrial-business-licensing#frequency-coordinators> (last visited July 27, 2021); See also, e.g., *Replacement of Part 90 by Part 88 to Revise the Private Land Mobile Radio Services and Modify the Policies Governing Them*, PR Docket 92-235, Second Report and Order, 12 FCC Rcd 14307, 14353 (1997).

³⁶ 13 CFR § 121.201, NAICS Code 813910.

³⁷ 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 (rec. July 15, 2011).

³⁸ *Id.*

³⁹ See <https://www.fcc.gov/general/700-mhz-rpc-directory-0> and <https://www.fcc.gov/general/800-mhz-rpc-directory>.

⁴⁰ See U.S. Census Bureau, *2017 NAICS Definition*, "517312 Wireless Telecommunications Carriers (except Satellite)," <https://www.census.gov/naics/?input=517312&year=2017&details=517312>.

⁴¹ See 13 CFR. § 121.201, NAICS code 517312 (previously 517210).

⁴² See U.S. Census Bureau, *2012 Economic Census of the United States*, Table ID EC1251SSSZ5, *Information: Subject Series, Estab and Firm Size: Employment Size of Firms for the U.S.: 2012*, NAICS Code 517210,

(continued...)

employment of 999 or fewer employees and 12 had employment of 1000 employees or more.⁴³ Thus using the SBA size standard, we estimate that all of the RPCs and the NRPC can be considered small.

14. *Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing.* This industry comprises establishments primarily engaged in manufacturing radio and television broadcast and wireless communications equipment.⁴⁴ 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.⁴⁵ The SBA has established a small business size standard for this industry of 1,250 employees or less.⁴⁶ U.S. Census Bureau data for 2012 show that 841 establishments operated in this industry in that year.⁴⁷ Of that number, 828 establishments operated with fewer than 1,000 employees, 7 establishments operated with between 1,000 and 2,499 employees and 6 establishments operated with 2,500 or more employees.⁴⁸ Based on this data, we conclude that a majority of manufacturers in this industry are small.

15. *Wireless Telecommunications Carriers (except Satellite).* This industry comprises establishments engaged in operating and maintaining switching and transmission facilities to provide communications via the airwaves. Establishments in this industry have spectrum licenses and provide services using that spectrum, such as cellular services, paging services, wireless internet access, and wireless video services.⁴⁹ The appropriate size standard under SBA rules is that such a business is small if it has 1,500 or fewer employees.⁵⁰ For this industry, U.S. Census Bureau data for 2012 show that there were 967 firms that operated for the entire year.⁵¹ Of this total, 955 firms employed fewer than 1,000 employees and 12 firms employed of 1000 employees or more.⁵² Thus under this category and the

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<https://data.census.gov/cedsci/table?text=EC1251SSSZ5&n=517210&tid=ECNSIZE2012.EC1251SSSZ5&hidePreview=false&vintage=2012>.

⁴³ *Id.* The available U.S. Census Bureau data does not provide a more precise estimate of the number of firms that meet the SBA size standard.

⁴⁴ See U.S. Census Bureau, *2017 NAICS Definition*, “334220 Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing,” <https://www.census.gov/naics/?input=334220&year=2017&details=334220>.

⁴⁵ *Id.*

⁴⁶ See 13 CFR § 121.201, NAICS Code 334220.

⁴⁷ See U.S. Census Bureau, *2012 Economic Census of the United States*, Table ID: EC1231SG2, *Manufacturing: Summary Series: General Summary: Industry Statistics for Subsectors and Industries by Employment Size: 2012*, NAICS Code 334220, <https://data.census.gov/cedsci/table?text=EC1231SG2&n=334220&tid=ECNSIZE2012.EC1231SG2&hidePreview=false>.

⁴⁸ *Id.* The available U.S. Census Bureau data does not provide a more precise estimate of the number of firms that meet the SBA size standard.

⁴⁹ See U.S. Census Bureau, *2017 NAICS Definition*, “517312 Wireless Telecommunications Carriers (except Satellite),” <https://www.census.gov/naics/?input=517312&year=2017&details=517312>.

⁵⁰ See 13 CFR § 121.201, NAICS Code 517312 (previously 517210).

⁵¹ See U.S. Census Bureau, *2012 Economic Census of the United States*, Table ID: EC1251SSSZ5, *Information: Subject Series: Estab and Firm Size: Employment Size of Firms for the U.S.: 2012*, NAICS Code 517210, <https://data.census.gov/cedsci/table?text=EC1251SSSZ5&n=517210&tid=ECNSIZE2012.EC1251SSSZ5&hidePreview=false&vintage=2012>.

⁵² *Id.* The available U.S. Census Bureau data does not provide a more precise estimate of the number of firms that meet the SBA size standard.

associated size standard, the Commission estimates that the majority of Wireless Telecommunications Carriers (except Satellite) are small entities.

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

16. The nationwide framework described in the *Eighth Further Notice* may impose new or additional reporting or recordkeeping and/or other compliance obligations on small entities, if adopted. The reporting or recordkeeping and/or other compliance obligations generally fall into two categories: technical requirements and eligibility/governance criteria. Potential information collections and compliance requirements that are technical in nature may include costs associated with compensating engineering or technical staff or consultants or attorneys which the Commission is unable to quantify at this time. The purpose of the information collections is to ensure that future operations protect incumbent operations from interference, and to make it feasible to identify the source of any actual interference that may occur, as well as maximize use of the 4.9 GHz band. We discuss these potential requirements below.

17. *Licensing Database and Frequency Coordination.* The *Eighth Further Notice* seeks comment on requiring base and mobile stations, permanent fixed P-P transmitters and receivers, and permanent fixed P-MP transmitters and receivers in the 4940-4990 MHz band to be licensed individually on a site-by-site basis for interference protection and frequency coordination purposes which would impose a one-time information collection requirement on existing 4.9 GHz band licensees. The information collected would include technical parameters such as transmitter and receiver antenna coordinates, azimuth (direction), polarization, beamwidth, physical dimensions, gain, and height above ground, as well as transmit details such as power, channel, emission, and would be collected on Form 601 in the Commission's Universal Licensing System database. We expect that there will not be any application fees associated with this information collection for public safety entities because they are exempt from application fees pursuant to 47 CFR § 1.1116(b). To the extent non-public safety access is permitted in the band however, non-public safety entities would incur application fee costs.

18. The *Eighth Further Notice* also seeks comment on requiring formal frequency coordination in the 4.9 GHz band to support interference protection and increase public safety confidence to use the band. If formal frequency coordination is adopted, we have requested comment on the criteria and type of certification the Commission should use to certify coordinators which may impose reporting and recordkeeping obligations. The selected frequency coordinators could be subject reporting and recordkeeping obligations associated with coordination for the 4.9 GHz band. Additionally, licensees could be subject to requirements to submit information to frequency coordinators and subject to compliance costs associated frequency coordination.

19. *Facilitating Non-Public Safety Access to the Band.* The *Eighth Further Notice* seeks comment various methods of enabling non-public safety access to the 4.9 GHz band alongside public safety access, including tiered licensing, a dynamic spectrum access system, and overlay licenses. For any of these methods, either the Commission or a third party would collect information from non-public safety users that wish to access the 4.9 GHz band. Such users may be classified as small businesses, small organizations, small governmental jurisdictions; PLMR licensees; and wireless telecommunications carriers (except satellite). The information collected would likely be equivalent to information collected on Form 601 of the Commission's Universal Licensing System database. For the dynamic spectrum access system method, a third party database would collect certain licensing and operational information from incumbent public safety 4.9 GHz band PLMR licensees. The amount of information collected, the means, and the frequency of such collection depends on whether the dynamic spectrum access system database would draw existing sources of such information, such as information contained in the Commission's Universal Licensing System. The *Eighth Further Notice* also seeks comment on the potential use of an incentive auction as part of the discussion on granting exclusive access rights which would have recordkeeping and data submission obligations.

20. *Nationwide Licensee or Band Manager.* The *Eighth Further Notice* seeks comment on designating a nationwide band manager that would be responsible for developing a nationwide framework

for the 4.9 GHz band. If adopted, a one-time information collection may take the form of a band manager application and a proposed nationwide framework describing how different types of entities may operate within the 4.9 GHz band.

21. *Regional Planning Committees.* The *Eighth Further Notice* seeks comment on a requiring regional planning committees (RPCs) to file regional plans, which could impact reporting and recordkeeping obligations for RPCs. Under the Commission's existing rules in the 4.9 GHz licensing regime, the filing of regional plans by RPCs is voluntary.⁵³ Sections 90.1211(b) and (c) of the Commission's rules detail certain information that must be submitted in regional plans⁵⁴ and provide instructions for plan modifications.⁵⁵ In the *Eighth Further Notice*, we inquire whether to develop a standardized template to ensure that the information submitted in all regional plans is consistent and supports a nationwide approach, and whether to allow RPCs to file alternative regional plans that vary from a standardized approach.

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

22. The RFA requires an agency to describe any significant, specifically small business, 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 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.”⁵⁶

23. The Commission's reliance on technical and eligibility requirements utilized in other public safety and PLMR spectrum bands as the basis of inquiries in *Eighth Further Notice* potentially provides regulatory policies and frameworks that small entities are operationally familiar with and may therefore minimize any substantial economic impact if similar requirements are adopted in this proceeding. To assist in the Commission's evaluation of the economic impact on small entities as a result of the actions that have been proposed in this proceeding, and the options and alternatives for such entities, the Commission has raised questions and sought comment on these matters in the *Eighth Further Notice*. As part of the inquiry, the Commission has specifically requested that commenters include costs and benefit analysis data in their comments. Additionally, we are seeking comment on proposals in the *Sixth Further Notice*, which include inquiries and requests for information on the impacts for small entities and courses of action that might be considered to accommodate the resources small entities. For

⁵³ See 47 CFR § 90.1211.

⁵⁴ 47 CFR § 90.1211(b) specifies that regional plans must incorporate the following common elements: (1) Identification of the document as a plan for sharing the 4.9 GHz band with the region specified along with the names, business addresses, business telephone numbers and organizational affiliations of the chairperson(s) and all members of the planning committee; (2) A summary of the major elements of the plan and an explanation of how all eligible entities within the region were given an opportunity to participate in the planning process and to have their positions heard and considered fairly; (3) An explanation of how the plan was coordinated with adjacent regions; and (4) A description of the coordination procedures for both temporary fixed and mobile operations, including but not limited to, mechanisms for incident management protocols, interference avoidance and interoperability.

⁵⁵ 47 CFR § 90.1211(c) explains that an RPC seeking to modify its regional plan must submit a written request, signed by the RPC, to the Chief, Wireless Telecommunications Bureau. The request must contain the full text of the modification, and a certification that all eligible entities had a chance to participate in discussions concerning the modification and that any changes have been coordinated with adjacent regions information collection requirements for modification of regional plans.

⁵⁶ 5 U.S.C. § 604(a)(6).

example, as part of the proposed information collection requirement to make information available to frequency coordinators to ensure that these operations are protected from interference, the *Sixth Further Notice* proposed a one-year deadline for licensees to complete this information collection after final rules in this proceeding become effective. Before the deadline, the Commission would waive frequency coordination requirements. After one year, the information collection would be subject to frequency coordination requirements, including frequency coordination fees. The Commission also sought comment on whether the status of a license should become secondary if the incumbent licensee does not meet the one-year deadline. The *Sixth Further Notice* sought comment on whether small entities should have a lengthier deadline, and what showing the Commission should require from licensees to attest that they qualify as small entities. The *Sixth Further Notice* also asked whether the Commission should require small entities to file attestations by the one-year deadline or accept attestations after the deadline at the time they eventually complete the information collection.

24. The Commission is hopeful that the comments it receives will specifically address matters impacting small entities and include data and analyses relating to these matters. Further, while the Commission believes the rules that are eventually adopted in this proceeding should benefit small entities, whether public safety or non-public safety, by giving them more options for gaining access to valuable spectrum, the Commission expects to more fully consider the economic impact and alternatives for small entities following the review of comments filed in response to the *Eighth Further Notice*. The Commission's evaluation of this information will shape the final alternatives it considers, the final conclusions it reaches, and any final actions it ultimately takes in this proceeding to minimize any significant economic impact that may occur on small entities.

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

25. None.

**STATEMENT OF
ACTING CHAIRWOMAN JESSICA ROSENWORCEL**

Re: *In the Matter of Amendment of Part 90 of the Commission's Rules*, WP Docket No. 07-100

On September 11th, it is now ritual. We remember the attacks that drew us together as a nation. We come together in the shared sorrow of nearly 3,000 lives lost. And we honor the heroism of so many first responders who ran toward danger and saved the lives of many more.

It is hard to believe it has now been two decades since that fateful day. We've learned a lot in the intervening years about strength and resilience and about public safety—and what kind of support they need to do their jobs.

So I believe it is appropriate that in September the Federal Communications Commission turns its attention to first responders and asks how we can ensure our rules and policies help those who help us in danger. That starts with communications—making sure public safety has the networks they need to respond when the unthinkable occurs.

Today we commit to public safety opportunities in the 4.9 GHz band. Last year, in a decision I believe was misguided, the FCC gave state authorities the right to remove public safety from these airwaves and pursue revenue opportunities with this spectrum. From front to back, this decision lacked support in the record. I believe three things were fundamentally wrong with it.

First, by breaking the 4.9 GHz band into a patchwork of state leases, it reversed two decades of work to increase interoperability for first responder communications in response to the events of September 11th.

Second, by fragmenting the 4.9 GHz band at the state level it reduced the likelihood we would have consistent and reliable information about what spectrum is available and how it is being used.

Third, by pulling back the 4.9 GHz band at a time when we are facing a devastating pandemic, raging wildfires, seasonal hurricanes, and increased use of communications across the board, it denied public safety networks opportunities to grow.

To be clear, there is room for improving public safety use of the 4.9 GHz band. But taken together, these three problems demonstrate that the FCC's earlier decision is not the right way to go.

So we are vacating these earlier rules. In addition, we are kicking off a new rulemaking to think big about the future of the 4.9 GHz band—with public safety fully in mind. For starters, we ask how we can advance their access to the latest technologies, like 5G. But we've got new ideas to make it happen. To this end, we seek comment on expanding priority and preemption for public safety users, excess capacity leasing, and shared access models like the Citizens Broadband Radio Service. I'm convinced there are creative opportunities for this spectrum that will help us expand our 5G future and bring public safety communications along, too.

Thank you to all of my colleagues for their input in this effort. Thank you also to Ken Carlberg, Steven Carpenter, Rochelle Cohen, Tom Eng, John Evanoff, Lisa Fowlkes, David Furth, Charlene Collazo Goldfield, Ryan Hedgpeth, William Kang, Debra Jordan, Brian Marengo, Nicole McGinnis, Saswat Misra, Roberto Mussenden, Erika Olsen, Austin Randazzo, Rasoul Safavian, Tracy Simmons, and Zenji Nakazawa from the Public Safety and Homeland Security Bureau; Jon Markman, Charles Mathias, Roger Noel, Halie Peacher, Paul Powell, Catherine Schroeder, and Joel Taubenblatt from the Wireless Telecommunications Bureau; Jeremy Marcus, Raphael Sznajder, and Ashley Tyson from the Enforcement Bureau; Justin Faulb from the Wireline Competition Bureau; Maura McGowan and Chana

Wilkerson from the Office of Communications Business Opportunities; Jonathan Campbell, William Huber, Evan Kwerel, Paul Lafontaine, Kate Mataves, Gary Michaels, Erik Salovaara, Deena Shetler, Martha Stancil, Donald Stockdale, and Emily Talaga from the Office of Economics and Analytics; and David Horowitz, Douglas Klein, and William Richardson from the Office of General Counsel.

**STATEMENT OF
COMMISSIONER BRENDAN CARR
CONCURRING IN PART AND APPROVING IN PART**

Re: *In the Matter of Amendment of Part 90 of the Commission's Rules*, WP Docket No. 07-100

Over the last four years, the FCC took the bold steps necessary to unleash an unprecedented amount of mid-band spectrum for 5G and other next-gen operations. Those efforts included action on 280 MHz in the C Band, 45 MHz in the 5.9 GHz band, 1,200 MHz in the 6 GHz band, 30 MHz in the L Band, 200 MHz in the 2.5 GHz band, 50 MHz in the 4.9 GHz band, as well as work to prepare 100 MHz in the 3.45 GHz band for auction next month. Each of those bands took quite a lot of work over the course of many months and years.

That's why I was disappointed when the FCC voted to take the 50 MHz at 4.9 GHz off the board earlier this year by staying our 2020 decision. I dissented from that decision, but as I said at the time, I am open to working with my colleagues, the public safety community, and all other stakeholders on a new framework for this important band of spectrum. That remains true today. Our 2020 decision was certainly not the only way to ensure that the 4.9 GHz spectrum can be put to good use. So while I concur on the portion of today's decision that reverses our 2020 decision, I approve the Notice that seeks comments on a path forward.

I welcome the chance to work together towards a quick resolution that serves the public interest and, in particular, the public safety stakeholders that have a deep commitment to this band. I thank the staff of the Wireless Telecommunications Bureau and the Public Safety and Homeland Security Bureau for preparing this item.

**STATEMENT OF
COMMISSIONER GEOFFREY STARKS**

Re: *In the Matter of Amendment of Part 90 of the Commission's Rules*, WP Docket No. 07-100

It's been nearly 20 years since the Commission first designated the 4.9 GHz band for public safety use. The results have been frustrating, at best. While FCC records show over 3,500 licensees in the band, it is widely agreed that the spectrum remains underutilized, particularly in rural areas. That's why the Commission has repeatedly sought to consider and adopt new approaches to the band, including today's Eighth Further Notice of Proposed Rulemaking.

The item adopted late last year was an abdication of our federal spectrum policymaking responsibility and risked the creation of dozens of inconsistent state-based spectrum regimes with different approaches to critical issues like interoperability, security, and interference protection. As I stated in my dissent to that item, the majority's decision could have caused public safety usage of the 4.9 GHz band to become less efficient, secure, and reliable—even as commercial interest remained meager at best. It's no surprise that, in response to the multiple petitions for reconsideration of that decision, not a single party defended the original order.

Today's decision takes a much stronger approach by starting with the recognition that public safety is the primary purpose of the band, and we should focus our efforts on fostering greater public safety use of the band. That means a nationwide, coordinated approach to management of the band with better frequency coordination, a greater understanding of spectrum usage and availability, and encouragement of the use of the latest 5G technology.

While recognizing that public safety should remain the priority, I also support asking how we might expand use of the band to non-public safety entities, whether through leases, segmenting the band, managed access, or some other form of sharing. I look forward to hearing from commenters about how such entities can use the band in a manner that does not cause harmful interference to public safety operations.

I support this item and thank the staff of the Public Safety and Homeland Security and Wireless Telecommunications Bureaus for their hard work.

**STATEMENT OF
COMMISSIONER NATHAN SIMINGTON**

Re: *In the Matter of Amendment of Part 90 of the Commission's Rules*, WP Docket No. 07-100

I am happy to approve today's item. I am particularly encouraged by the fact that the *Eighth Further Notice* explores an exclusive use licensing approach for commercial use of the 4.9 GHz band, which could prove beneficial from an operational and economic perspective. An auction of exclusive use licenses for 5G and other advanced services would harvest the most value for the 4.9 GHz band, as we saw with the C-Band auction. Such an approach also stands the best chance of creating a more robust 5G equipment ecosystem that public safety licensees operating in the band so desperately need.

I am also heartened that we explore an incentive auction approach, which could provide value to public safety licensees who choose to relocate from the band. Seeking comment on these proposals will ensure that we have investigated all possible options for making efficient and economic use of this valuable slice of mid-band spectrum, while also benefitting public safety.

I look forward to a robust record. Many thanks to the staff for their hard work on this item.