Before the
Federal Communications Commission
Washington, D.C.

In the Matter of	)	
	)	
The Development of Operational,	)	
Technical and Spectrum Requirements	)	
For Meeting Federal, State and Local	)	WT Docket No. 96-86
Public Safety Agency Communication	)	
Requirements Through the Year 2010	)	
	)	
Establishment of Rules and Requirements	)	
For Priority Access Service	)	

FIRST REPORT AND ORDER
AND
THIRD NOTICE OF PROPOSED RULEMAKING

Adopted: August 6, 1998 **Released:** September 29, 1998

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

By the Commission:

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I. INTRODUCTION

1. As stated in the Final Report of the Public Safety Wireless Advisory Committee (PSWAC), "[n]o responsibility is more fundamental and reflective of the Nation's values than that of its public safety agencies."[1] In this combined *First Report and Order* and *Third Notice of Proposed Rule Making* (hereinafter *First Report* and/or *Third Notice*, as applicable), we recognize this fundamental responsibility, and take additional steps toward achieving our goal of developing a flexible regulatory framework to meet vital current and future public safety communications needs. We also strive to ensure that sufficient spectrum to accommodate efficient, effective telecommunications facilities and services will be available to satisfy public safety communications needs into the 21st century.[2] Our actions herein constitute significant steps toward resolving certain of the telecommunications challenges facing the public safety community, including, but not limited to, making available sufficient spectrum to take advantage of innovation in technology.[3]

2. In this *First Report*, we establish a band plan and adopt service rules necessary to commence the licensing process in the newly-reallocated public safety spectrum at 764-776 MHz and 794-806 MHz (hereinafter "the 700 MHz band").[4] In addition, we designate 2.6 megahertz of spectrum in the 700 MHz band for interoperability purposes (the ability of different governmental agencies to communicate across jurisdictions and with each other). We also adopt certain technical specifications that enhance spectrum efficiency, promote nationwide interoperability, and minimize harmful interference. In the *Third Notice*, we seek comment on how to license the 8.8 megahertz of spectrum designated as "reserve" in the *First Report*. Specifically, we seek comment on whether some or all of this spectrum should be licensed by means of the Regional Planning Committee process, licensed directly to each state, or licensed pursuant to any alternative licensing process not expressly described herein. Further, we propose technical criteria to protect satellite-based global navigation systems from harmful interference. We also seek comment on proposals to promote interoperability on public safety channels below 512 MHz. Additionally, we seek comment concerning how the public safety community is addressing computer hardware and software adjustments needed to remedy the Year 2000 problem.

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[1] *Final Report of the Public Safety Wireless Advisory Committee to the Federal Communications Commission*, September 11, 1996, at 5 (*PSWAC Final Report*).

[2] *See* Report and Plan for Meeting State and Local Government Public Safety Agency Spectrum Needs Through the Year 2010, *Report and Plan*, 10 FCC Rcd 5207 (1995) (*1995 FCC Public Safety Report*); *see also* Development of Operational, Technical and Spectrum Requirements For Meeting Federal, State and Local Public Safety Agency Communications Requirements Through the Year 2010; Establishment of Rules and Requirements of Priority Access Service, WT Docket No. 96-86, *Second Notice of Proposed Rule Making*, 12 FCC Rcd 17,706 (1997) (*Second Notice*).

[3] *See, e.g., PSWAC Final Report*, Key Recommendation 2.2.1, p.21. The *PSWAC Final Report* is in two volumes. Volume One contains pages 1-72. Volume Two, which contains the reports of the individual subcommittees, is paginated twice: once by each section, and a second time to indicate the page's sequence in the entire report. Throughout this item, we cite to the numbers begun in Volume One and carried through to the end.

[4] *See* Reallocation of Television Channels 60-69, the 746-806 MHz Band, ET Docket No. 97-157, *Report and Order*, 12 FCC Rcd 22,953 (1997) (*Reallocation Report and Order*).

II. EXECUTIVE SUMMARY

3. In this *First Report* and *Third Notice*, we fulfill the Congressional mandate expressed in the Balanced Budget Act of 1997[5] to establish the terms and conditions that will govern use of the 24 megahertz of spectrum recently reallocated from broadcast to public safety services.[6] The statute defines in detail the services for which Congress intends this spectrum to be used and requires the Commission to establish service rules,[7] by September 30, 1998, that will commence the process of assigning licenses for this spectrum.[8] The legislative history reflects that the licensing commencement date was added to the statute in light of the critical need for public safety spectrum in some markets.[9] The service rules that we adopt today, therefore, are balanced to give effect to each provision of the statutory definition of public safety services for which the spectrum is allocated, in order to commence licensing expeditiously, and with minimal information submission requirements or similar regulatory burdens.[10] With these aims in mind, we believe that Congress expected the Commission to draw on its extensive, relevant experience in allocating and licensing other Private Land Mobile Radio (PLMR) spectrum designated for public safety-related activities.

4. By enacting the 1997 Budget Act, Congress sought to achieve two important goals. The first was to provide spectrum sufficient for public safety services to meet current and projected communications requirements, including innovative technical applications. The second was to provide the minimum technical framework necessary to standardize operations in this spectrum band, including, but not limited to: (a) establishing interference limits at the boundaries of the spectrum block and service areas; (b) establishing technical restrictions necessary to protect full-service analog and digital television service during the transition to digital television services; (c) permitting public safety licensees the flexibility to aggregate multiple licenses to create larger spectrum blocks and service areas, and to disaggregate or partition licenses to create smaller spectrum blocks or service areas; and (d) ensuring that the new spectrum will not be subject to harmful interference from television broadcast licensees.

5. We believe that the rules adopted and proposed herein provide a regulatory framework that meets Congress' goals. Specifically, the *First Report* and *Third Notice* provides a structure to: (1) enable the

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[5] *See* Balanced Budget Act of 1997, Pub. L. No. 105-33, § 3004, 111 Stat. 251 (1997) (1997 Budget Act), codified at 47 U.S.C. § 337(a)(1).

[6] *Reallocation Report and Order*, 12 FCC Rcd 22,953.

[7] *See, e.g.*, 47 U.S.C. § 337(d) (contemplates Commission establishing service rules with respect to licenses granted pursuant to Section 337).

[8] *See* 47 U.S.C. § 337(b).

[9] *See* H.R. Report No. 149, 105th Congress, 1st Sess. at 1210 (1997). So that the Commission would be prepared to comply with this directive, we committed to having service rules for the public safety spectrum in place by September 30, 1998. *See Second Notice*, 12 FCC Rcd at 17,709-10.

[10] *See* Regulatory Flexibility Act (RFA), 5 U.S.C. §§ 601-612; Paperwork Reduction Act of 1995 (PRA), 44 U.S.C. § 3506(c)(2). The RFA and PRA were amended by the Contract with America Advancement Act of 1996, Pub. L. No. 104-121, 110 Stat. 847 (1996) (CWAAA). Title II of the CWAAA is the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA).

development of a national interoperability plan; (2) allow Regional Planning Committees (RPCs)[11] maximum flexibility to meet state and local needs, encourage innovative use of the spectrum, and accommodate new and as yet unanticipated developments in technology and equipment; (3) provide the spectrum management and planning mechanisms necessary to develop multiple user public safety communications systems and local and regional interoperability systems that effectively incorporate all public safety services providers; (4) adopt licensing rules for eligibility, permissible use, and coordinated spectrum planning for the 700 MHz band; and (5) adopt such competitively neutral technical standards as are required to efficiently achieve interoperability in designated spectrum.

6. By establishing a flexible regulatory framework for public safety use of the 700 MHz band, we seek to enable public safety organizations to effectively use this new allocation for a variety of operational modes (voice, data, image/high speed data (HSD), and video), to promote competition in the equipment markets through flexible technical standards, and to promote development of innovative public safety technologies.[12] After careful consideration of the comments in this proceeding, we adopt a band plan for the new public safety allocation in the 700 MHz band that we believe will best achieve these goals. This band plan is supported by a direct outgrowth of the record and will provide some technical features common to the entire band, while allowing local public safety entities, through RPCs, the discretion to configure channels to meet their individual needs.[13] We believe that this band plan strikes an appropriate balance between the standardization necessary to achieve nationwide interoperability, the development of competitive equipment markets, and the degree of regional flexibility necessary to allow entities the opportunity to fashion approaches tailored to meet the individual needs of diverse regional communities.

7. Within our band plan, we designate approximately 10 percent of the 700 MHz public safety spectrum for nationwide interoperable communications.[14] Interoperability is the ability of units from two or more government agencies to effectively interact with one another and exchange the full range of information needed for public safety entities to apply their best efforts to resolution of even the most critical situations. Interoperability signifies the crowning achievement of this proceeding.[15] In both the *First Notice* and the *Second Notice,* the Commission repeated its conclusion that the inability of public safety agencies to efficiently

[11] Regional planning committees are public safety spectrum management committees. *See, e.g.*, para. 10, *infra*.

[12] *See Second Notice*, 12 FCC Rcd at 17,763.

[13] 47 U.S.C. § 337(d)(3).

[14] As suggested by commenters, the nationwide interoperability spectrum comprises a substantial number of specific channels interspersed throughout segments of the 700 MHz band in a regular pattern, rather than blocks of contiguous channels. Such interspersion makes it technically feasible to utilize these interoperability channels simultaneously in a single area, if the need arises.

[15] *See Second Notice*, 12 FCC Rcd at 17,719; *PSWAC Final Report* at 69. In the *Second Notice* the Commission stated, based on general support among the commenters, that the definition of interoperability proposed by PSWAC should be adopted. *Id.* at 17,721. The PSWAC interoperability definition reads: "An essential communication link within Public Safety and public service wireless communications systems which permits units from two or more different agencies to interact with one another and to exchange information according to a prescribed method in order to achieve predictable results." For purposes of this document we will use the abbreviated description.

communicate with one another is a glaring deficiency in present day public safety communications.[16] As a result of the interaction of numerous political, technological, financial and regulatory obstacles that work to inhibit attempts to establish universal public safety interoperability, this deficiency has persisted despite many years of efforts to eradicate it.[17] In view of this situation, we believe that it is necessary for the Commission to dedicate sufficient spectrum to nationwide interoperability, and charter a federal advisory committee (The National Coordinating Committee [NCC]) that will develop operational and technical recommendations. The operational recommendations (*e.g.*, protocols for prioritizing user access) of the NCC will, however, be subject to Commission approval. Because the NCC will be required to become American National Standards Institute-certified, the Commission will not unnecessarily disturb technical standards recommended through this open and neutral process. Finally, in the *Third Notice* we are seeking comment on whether the interoperability spectrum should be licensed by means of the Regional Planning Committee process or licensed directly to each state. We also invite commenters to suggest alternative methods.

8. We also are designating a large number of channels (approximately 53 percent in the 700 MHz band) for general (*i.e.* local, regional or state) use. The RPCs will determine the specific uses of these channels, and they may begin the planning process to use these channels upon release of this *First Report*. Finally, the *Third Notice* seeks comment on proposals for use of the remainder of the band (approximately 37 percent). This 8.8 megahertz of spectrum will be designated as "reserve spectrum" during the pendency of the *Third Notice*.

9. The band plan we adopt today also accommodates all of the existing operational modes that we described in the *Second Notice* (voice, data, image/HSD, and video) but is also flexible enough to allow deployment of the technologies of tomorrow. As recommended by some of the commenters, we are dividing the band into separate segments for narrowband and wideband communications. To promote efficient spectrum usage and flexibility, our band plan incorporates a "building block" channelization approach, based on the smallest practical channel sizes for narrowband and wideband public safety communications. The RPCs will be allowed to combine these minimum size standard channels, to create larger channels as needed to accommodate transitional technology, such as 12.5 kHz voice and data, or communications requiring wider bandwidths, such as 19.2 kilobits per second (kbps) data.[18] Some of these features are illustrated generally in the following charts:

[16] *PSWAC Final Report* at 6.

[17] *Id.*

[18] Given that the equipment for the 700 MHz band is still in its early stages of development, we believe that it is crucial that the band plan we adopt today be sufficiently flexible to accommodate a wide array of innovative uses.

Spectrum Overview

700 MHz Public Safety Band — 24 megahertz of spectrum
(as adopted by the Commission December 31, 1997)[19]

TV 60	TV 61	TV 62	TV 63	TV 64	TV 65	TV 66	TV 67	TV 68	TV 69
			Public Safety 6 MHz	Public Safety 6 MHz				Public Safety 6 MHz	Public Safety 6 MHz

First Report and Order

- Designates for General Use (12.6 MHz)
- Designates for Interoperability (2.6 MHz)
- Designates as Reserve Spectrum (8.8 MHz)

Third Notice of Proposed Rulemaking

- Seeks comment on State Licenses for Interoperability Channels (2.6 MHz)
- Seeks comment on Use and Licensing of Reserve Spectrum (8.8 MHz)

[19] *See Reallocation Report and Order*, 12 FCC Rcd at 22,959.

Band Plan - Arrangement of Channels
12 megahertz of spectrum shown is for TV Channels 63 and 64
(TV Channels 68 and 69 follow the same arrangement)

TV Channel 63 (6 MHz)		TV Channel 64 (6 MHz)
Narrowband 6.25 kHz channels (aggregate to 25 kHz)	**Wideband** 50 kHz channels (aggregate to 150 kHz)	**Narrowband** 6.25 kHz channels (aggregate to 25 kHz)
Channel Pattern	Channel Pattern	Channel Pattern
52 General Use 2 Reserve Channels 2 Interoperability 2 Reserve Channels 2 Interoperability 6 Reserve Channels 2 Interoperability 12 Reserve Channels	6 Reserve Channels 3 Interoperability 24 General Use 3 Interoperability 21 Reserve Channels 6 Interoperability 21 Reserve Channels 3 Interoperability 24 General Use 3 Interoperability 6 Reserve Channels	52 General Use 2 Reserve Channels 2 Interoperability 2 Reserve Channels 2 Interoperability 6 Reserve Channels 2 Interoperability 12 Reserve Channels
(the above repeats 5 times, then the channel pattern continues as follows)		(the above repeats 5 times, then the channel pattern continues as follows)
52 General Use 14 Reserve Channels 2 Interoperability 12 Reserve Channels		52 General Use 14 Reserve Channels 2 Interoperability 12 Reserve Channels

10. Additional major conclusions of the *First Report* are as follows:

    # We adopt a three-pronged test for determining eligibility to hold a license in the 700 MHz band which follows the 1997 Budget Act definition of "public safety services."[20] The three prongs for determining eligibility are: (a) purpose of use; (b) identity of licensee; and (c) noncommercial *proviso*. Based on this criteria, we conclude that entities eligible to be licensed in the 700 MHz band public safety spectrum are: (1) state and local governments and (2) non-governmental organizations (NGOs) expressly authorized by a state or local governmental entity whose mission is the oversight of or provision of services to protect the safety of life, health or property.[21]

[20] *See* 47 U.S.C. § 337(f).

[21] *See* 47 U.S.C. § 337(f)(1).

- In situations where a state or local governmental licensee needs to communicate by radio with a public safety service provider that is not licensed in the 700 MHz band, the licensee may permit the unlicensed provider to share the use of its system for noncommercial public safety services under Section 90.179 of the Commission's Rules.

- Federal public safety providers may be authorized to use the public safety spectrum in the 700 MHz band pursuant to the existing NTIA/FCC process for Federal government use of non-Federal government spectrum, as set forth in Part 2 of the Commission's Rules.[22] Federal use of the nationwide interoperability channels will be addressed in the recommendations to the Commission made by the NCC (described below).

- We adopt a regional planning approach to spectrum management for specific channels throughout the 700 MHz band, identified on the Spectrum Overview and Band Plan charts above as "General Use" (a total of 12.6 megahertz of spectrum). The 700 MHz band regional planning process will be similar to that which governs management of public safety spectrum in the 821-824 MHz and the 866-869 MHz bands.[23] To allow for additional flexibility, however, we provide a mechanism that allows states that either are included in multi-state regions or have portions of their states included in more than one region to opt out of their current regions and to form new regions along geographical lines conforming to state boundaries. Thus, a state split among more than one RPC may opt, through consensus of the state representatives, to reform RPC boundaries so that the state participates in a single RPC. Similarly, all representatives to RPCs from the same state may, by consensus, create a new RPC that conforms to the boundaries of that state.

- We will charter the NCC in accordance with the procedural steps contained in the Federal Advisory Committee Act (FACA)[24] that will seek American National Standards Institute (ANSI) certification and provide a national structure for use of the 700 MHz band nationwide interoperability spectrum. The major responsibilities of this committee will be to: (1) formulate and submit for Commission review and approval an operational plan to achieve national interoperability that includes a shared or priority system among users of the interoperability spectrum, for both day-to-day and emergency operations, and recommendations regarding Federal users' access to the interoperability spectrum; (2) recommend interoperability technical standards for Commission review and approval; (3) provide voluntary assistance in the development of coordinated regional plans; and (4) provide general recommendations to the Commission on operational plans of the public safety community.

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[22] *See* 47 C.F.R. § 2.103.

[23] *See* Development and Implementation of a Public Safety National Plan and Amendment of Part 90 to Establish Service Rules and Technical Standards for Use of the 821-824/866-869 MHz Bands by the Public Safety Services, GEN Docket No. 87-112, *Report and Order,* 3 FCC Rcd 905 (1987) (*National Plan Report and Order*).

[24] Federal Advisory Committee Act, 5 U.S.C., App. 2 (1988).

- We allow all of the certified public safety frequency coordinators[25] to provide coordination in the 700 MHz band, so that competition among coordinators will provide incentives for lower coordination fees and better quality services.

- We adopt technical regulations sufficient to establish a general framework for seamless nationwide interoperability, facilitate spectrum management, encourage efficient and effective spectrum use, promote competition and avoid undue delays in equipment development.

- We adopt geographic separation requirements based on a 40 dB Desired-to-Undesired signal strength ratio (D/U) to protect the TV/DTV stations and public safety spectrum users from harmful interference to each other and to comply with the requirements of the 1997 Budget Act. We emphasize that the necessity for public safety licensees to share this 24 megahertz of spectrum with both analog and digital TV broadcast stations until December 31, 2006 will require the utmost cooperation between the TV stations and the public safety community.

- We adopt rules requiring that licenses for public safety facilities proposed to be located within 75 miles of the U.S.-Canada border or the U.S.-Mexico border be conditioned on avoiding harmful interference to television station receivers in those countries. We note that additional licensing conditions governing cross-border sharing between public safety and television operations may be required after final agreements with the governments of those countries are signed.

11. The major proposals in the *Third Notice* are as follows:

- We seek comment on how to license the portion of the 700 MHz band designated as reserve spectrum. Specifically, we request comment on whether some or all of the reserve spectrum should be licensed by means of the RPC process or directly to each state for deployment of statewide systems. The *Third Notice* also invites commenters to suggest other proposals for licensing of the 8.8 megahertz of spectrum.

- We also seek comment on whether the channels designated in the *First Report* for nationwide interoperability (2.6 megahertz of the 700 MHz band subject to interoperability guidelines to be recommended by the NCC and approved by the Commission) should be licensed by means of the Regional Planning Committee process or licensed directly to each state.

- In response to the extensive public safety comments submitted in this record that additional interoperability spectrum is needed below 512 MHz to fully address interoperability nationwide, we examine three additional possible interoperability solutions. We propose to designate five channels in each of the existing public safety bands at 150-174 MHz and 450-512 MHz for mutual aid purposes. We also seek further comment on the need for a separate interoperability band below 512 MHz. Specifically, we seek comment on the feasibility of using the 138-144 MHz band currently used by the U.S. Department of Defense

[25] The coordinators are: Association of Public-Safety Communications Officials-International, Inc. (APCO) International Association of Fire Chiefs, Inc. (IAFC)/International Municipal Signal Association (IMSA); Forestry Conservation Communications Association (FCCA); and American Association of State Highway and Transportation Officials (AASHTO).

and the Federal Emergency Management Agency as a separate interoperability band.[26] We also seek comment on our proposed reallocation of two channel pairs in the VHF 156-162 MHz band for interoperable channels of communication in 33 Economic Areas (EAs), which are now available for assignment to public safety entities.[27]

- We also propose technical solutions and invite comments on how to protect certain global navigation satellite systems, particularly the Global Orbiting Navigation Satellite Systems (GLONASS) and Global Positioning System (GPS).[28] We are concerned that second harmonic emissions from public safety equipment operating in the 794-806 MHz band (TV channels 68 and 69) may cause harmful interference to aeronautical users of GLONASS and GPS receivers and seek further comment to supplement the record on this matter.

- We also seek comment on how best to ascertain the extent, reach, and effectiveness of Year 2000 compliance initiatives that have been or are being undertaken by public safety entities, so that we can better understand the nature of the Year 2000 problem and the potential risks it poses to public safety communications networks.

12. The rules we adopt today represent an important step in advancing the goal of creating a national public safety wireless network. Achieving a flexible, efficient and effective framework to fully meet the communications needs of the public safety community on an ongoing basis, however, will require the long-term, coordinated efforts of public safety radio users and spectrum administrators at the Federal, state and local levels of government. The reallocation and availability of the 700 MHz band, made possible through the enactment of the 1997 Budget Act, provides not only a resolution for current spectrum deficiencies but also constitutes an important step toward solving the problem of how and where to accommodate the projected growth of both traditional and advanced voice, data, HSD and video communications services that will be required by public safety agencies into the 21st century.

III. BACKGROUND

13. In 1993, Congress directed the Commission to develop a framework to ensure that public safety communications needs are met through the year 2010.[29] Pursuant to that directive, the Commission issued a report to Congress identifying a need to gather additional information on the present and future communications requirements of public safety agencies.[30] In 1995, the Commission, together with the National Telecommunications and Information Administration (NTIA), established the Public Safety Wireless Advisory

[26] *See* Petition of the National Public Safety Telecommunications Council for Further Rulemaking to Allocate Spectrum in the 138-144 MHz Band for Public Safety (April 9, 1998) (*NPSTC Petition*).

[27] The channel pairs were formerly allocated in Section 80.371 of the Commission's Rules for VHF Public Coast Stations as public correspondence channels and were also shared under Section 90.283.

[28] GLONASS utilizes the Radionavigation-Satellite Service (space-to-Earth) band of 1598-1605 MHz.

[29] *See* 47 U.S.C. § 309(j)(10)(B)(iv), as added by the Omnibus Budget Reconciliation Act of 1993, Pub. L. No. 103-66, Title VI, § 6002, 107 Stat. 312 (1993).

[30] *1995 FCC Public Safety Report*, 10 FCC Rcd 5207 (1995).

Committee (PSWAC), pursuant to the Federal Advisory Committee Act (FACA),[31] to provide advice and recommendations regarding the communications needs of public safety agencies through the year 2010. Shortly thereafter, the Commission commenced this rulemaking proceeding, which sought to evaluate and plan for present and future public safety communications requirements.[32] In the *First Notice*, the Commission sought comment on a wide variety of public safety communications issues, including, but not limited to, future public safety spectrum needs, projected operational and technological requirements for interoperability (between and among public safety entities on a local and regional basis), and technical parameters needed to ensure efficient and effective communications.

14. In September 1996, the *PSWAC Final Report* was submitted to the Commission as part of the record in this proceeding. The *PSWAC Final Report* found that the spectrum then allocated to public safety was insufficient to support the current and projected voice and data needs of the public safety community, did not provide adequate capacity for obtaining interoperability, and was inadequate to meet future needs, based on projected population growth and demographic changes. The *PSWAC Final Report* concluded that in order to meet these needs, 25 megahertz of new public safety spectrum allocations would be needed within five years.[33] The *PSWAC Final Report* further stated that data communication and wireless video needs were also expected to grow rapidly, and additional spectrum was required to support new capabilities and technologies, including high speed data and video.[34]

15. On August 14, 1996, the Commission released a *Sixth Further Notice of Proposed Rule Making* in the digital television (DTV) proceeding, in which it acknowledged that a portion of the spectrum recovered from TV channels 60-69 when DTV is fully deployed "could be used to meet public safety needs."[35] In the *DTV Sixth Report and Order*, the Commission stated that it would initiate a separate proceeding to address the issue of how best to allocate TV channels 60-69, and would give serious consideration to allocating 24 megahertz of that spectrum for public safety use.[36] Subsequently, in the 1997 Budget Act, Congress directed the Commission to reallocate 24 megahertz of the spectrum recovered from TV channels 60-69 as a result of DTV implementation for public safety services.[37] Shortly thereafter, the Commission initiated a rulemaking proceeding in ET Docket No. 97-157 which led to the adoption of a *Report and Order* reallocating

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[31] Federal Advisory Committee Act, 5 U.S.C., App. 2 (1988).

[32] The Development of Operational, Technical, and Spectrum Requirements for Meeting Federal, State and Local Public Safety Agency Communication Requirements Through the Year 2010, *Notice of Proposed Rule Making*, 11 FCC Rcd 12,460 (1996) *(First Notice)*.

[33] *PSWAC Final Report* at 3.

[34] *Id.* at 19-20.

[35] Advanced Television Systems and Their Impact Upon the Existing Television Broadcast Service, MM Docket No. 87-268, *Sixth Further Notice of Proposed Rule Making*, 11 FCC Rcd 10,968, 10,980 (1996) (*DTV Sixth Notice*).

[36] Advanced Television Systems and Their Impact Upon the Existing Television Broadcast Service, MM Docket No. 87-268, *Sixth Report and Order*, 12 FCC Rcd 14,588, 14,626 (1997) (*DTV Sixth Report & Order*).

[37] 1997 Budget Act, codified at 47 U.S.C. § 337.

24 megahertz of spectrum located in the 700 MHz band for public safety services.[38] This new allocation is the largest ever made for public safety communications and constitutes a significant public benefit derived from the conversion of television broadcasting in the United States from analog technology to state-of-the-art digital technology.[39]

16. In the *Second Notice* in this proceeding, the Commission continued its inquiry into the present and future public safety communications needs and how best to use the newly reallocated 24 megahertz of spectrum in the 700 MHz band. It sought comment on a broad range of options to promote the efficient and effective use of the 700 MHz band to meet those needs.[40] Fifty comments, forty reply comments, and numerous *ex parte* presentations were received in response to the *Second Notice*.[41]

IV. FIRST REPORT AND ORDER

A. BAND PLAN

1. Introduction

17. In this section, we discuss the band plan we are establishing for the 700 MHz public safety band. For the technical and policy reasons discussed in the following paragraphs, we are dividing the band into separate segments for wideband and narrowband communications, establishing flexible channelization standards for these segments, designating some of the channels thereby created for nationwide interoperability and designating most of the other channels for general public safety use, pursuant to regional planning. The remaining channels will be held in reserve pending our adoption of the licensing proposals made in the *Third Notice*.

2. Interoperability

18. In the *Second Notice*, the Commission proposed to dedicate a significant amount of spectrum in the 700 MHz band solely for interoperability communications. We stated that the precise amount of spectrum devoted to interoperability would reflect the record of public safety user expertise, particularly with respect to the channelization required to maximize functionality. The Commission solicited comment on whether it is necessary or advisable to allot specific interoperability channels to accommodate each discrete use. We also solicited comment on whether channels should be designated solely for interoperable voice, data, image/HSD, or video, and, if so, how many channels should be designated for each category of use.[42]

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[38] Reallocation of Television Channels 60-69, the 746-806 MHz Band, ET Docket No. 97-157, *Notice of Proposed Rule Making*, 12 FCC Rcd 14,141 (1997); *Reallocation Report and Order*, 12 FCC Rcd 22,953 (1998).

[39] *See DTV Sixth Report and Order*, 12 FCC Rcd at 14,588.

[40] The *Second Notice* contained a section, prompted by a Petition for Rulemaking filed by the National Communications System (NCS), seeking comment on the establishment of Cellular Priority Access Service (CPAS) designed to meet the communications needs of public safety services in emergency and disaster situations. *See* 12 FCC Rcd at 17,779-800. We will defer action on this matter at this time.

[41] A list of commenters is provided in Appendix C.

[42] *See Second Notice*, 12 FCC Rcd at 17,739.

19. Nearly all commenters agree that the establishment of nationwide public safety interoperability is in the public interest.[43] The comments, however, oppose dedicating substantially more than 2.5 MHz or 10 percent of the 700 MHz band, solely for interoperability communications.[44] Several commenters note that limiting a larger portion of the spectrum to interoperability operations (e.g., mutual aid, day-to-day and task force) would severely curtail the availability of the 700 MHz band for routine daily operations, such as dispatch.[45]

20. Some commenters argue that the 700 MHz band is not as desirable as the 150 MHz and 450 MHz bands, from a radio propagation standpoint. Others prefer that interoperability channels be located in the bands below 512 MHz because of their proximity to the majority of current public safety operations.[46] Some of these commenters also advocate negotiating with the Department of Defense to allow shared interoperability use of the 138-144 MHz band.[47] Other commenters advocate designating two sets of channels for interoperability, one in the 700 MHz band and the other in the VHF band (150-170 MHz).[48] Nonetheless, the comments overwhelmingly support a flexible interoperability allocation that allows day-to-day, mutual aid, and task force interoperability operations in the 700 MHz band on a dynamic basis, and urge adoption of the PSWAC recommendation of 2.5 megahertz or approximately 10 percent of the spectrum as being the appropriate amount.[49] We observe that the requirement for interoperable communications systems includes both routine and emergency communications needs. After consideration of how these needs could be met by the new 700 MHz spectrum in combination with other existing and possible future interoperability channels, we have decided to designate 2.6 megahertz of spectrum in the 700 MHz band for nationwide interoperability purposes.

21. Many commenters informed us that designating nationwide interoperability channels in the 700 MHz band alone will not provide a comprehensive interoperability solution for many public safety agencies.[50] Because effecting the changes necessary to achieve nationwide, comprehensive interoperable communications involves complex, systemic problems, we believe that we must approach this undertaking simultaneously on several fronts. Therefore, we are also seeking comment regarding possible alternatives for interoperable communications on channels below 512 MHz in the *Third Notice* in this proceeding.

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[43] NTIA Comments at 9-10; *PSWAC Final Report* at 52.

[44] Ft. Lauderdale Reply Comments at 2; The City of Richardson, Texas Comments at 4; APCO at 10-11; Long Beach, California at 3-4.

[45] *See, e.g.*, APCO Comments at 10-11; Long Beach, California Comments at 3-4; National League of Cities (NLC) Comments at 7-9; Motorola Comments at 11.

[46] *See e.g.*, FLEWUG Comments at 13-14.

[47] NPSTC Comments at 10; FLEWUG Reply Comments at 12; Motorola Inc. Reply Comments at 2.

[48] IACP Comments at 3-5; FLEWUG Comments at 8.

[49] IACP Reply Comments at 2; the City of Fort Lauderdale, FL Reply Comments at 2.

[50] *See, e.g.*, IACP Comments at 4; NLC Comments at 9.

3. Types of Communications

22. In order to successfully perform their missions in the modern world, public safety entities must rely on a forward-looking spectrum policy that promotes beneficial technological advances into their communications systems.[51] When the Commission last allocated spectrum for public safety in 1987 it acknowledged the need for both voice and data communications.[52] Comments in response to the *First Notice*, however, suggested a need for even more advanced forms of public safety communications and maintained that this need extends beyond the context of interoperability.[53] In consideration of those views, the *Second Notice* sought comments regarding what types of public safety communications should be provided in the 700 MHz band. In particular, the Commission asked for comment on whether public safety entities would be better positioned to deploy advanced technologies in an orderly way if we were to subdivide the 700 MHz band into four communications modes: voice, data, image/HSD, and video.[54]

23. Most of the commenters support allowing all four types of communications in the 700 MHz band.[55] California, however, recommends that no spectrum in the 700 MHz band be allocated specifically for image/HSD or video anywhere in the country.[56] California and Ericsson argue that voice and data are the only types of communications that are needed for interoperability use.[57] Many of the other commenters, however, support having the flexibility to select from among all four types of communications on interoperability channels as well as the general use channels.[58]

24. There continues to be a demand for additional voice channels in many of the larger metropolitan areas.[59] Indeed, for most public safety operations, voice is and will continue to be the best and most effective means of communications.[60] The additional 24 megahertz of public safety spectrum in the 700 MHz band can

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[51] In this connection, we also believe that existing public safety systems should be year 2000 compliant so that public safety entities are not hampered in their efforts to successfully perform their missions using wireless communications. Therefore, we are furthering our discussion regarding the status of the public safety community's present and future year 2000 compliance efforts in the *Third Notice*.

[52] *National Plan Report and Order*, 3 FCC Rcd at 907.

[53] For example, the *PSWAC Final Report* describes numerous examples of new applications based on newly-developed technologies to serve the public safety community, including broadband data systems to provide access to databases for police officers on patrol, the use of video systems for surveillance purposes, and control of toxic or hazardous environments by robotics. *See PSWAC Final Report* at 2.

[54] *See Second Notice*, 12 FCC Rcd at 17,764-65.

[55] *See, e.g.*, NTIA Comments at 9*;* FLEWUG Comments at 13; NPSTC Comments at 10.

[56] *See* California Comments at para. 41.

[57] *See* Ericsson Comments at 4; California Comments at paras. 5, and 19.

[58] *See e.g.* Comments of NPSTC at 10; FLEWUG Comments at 9.

[59] *See, e.g., National Plan Report and Order*, 3 FCC Rcd at 907; *PSWAC Final Report* at 18.

[60] *See* key finding 2.1.1 of the *PSWAC Final Report* at 18.

address some of the requirements for additional voice channels in many areas in the near term, and in every area of the country at the end of the DTV transition period. There are also projected needs for additional spectrum to accommodate growth, for regional integrated systems, and to support the use by the public safety community of data applications, which are expected to increase exponentially in the next decade.[61] Public safety entities also seek additional spectrum to develop emerging technology applications, such as image/HSD, video, and perhaps multimedia applications, which will enable them to better and more efficiently serve the public. We note that only a limited number of channels for image/HSD and video can be provided in the 700 MHz band, because of the large bandwidth typically necessary for those applications.[62] We continue to believe, however, that the tentative conclusion in the *Second Notice* to make provision in the 700 MHz band for both current and evolving operational modes are sound. Accordingly, for both nationwide interoperability and general use spectrum, our band plan is designed with sufficient flexibility to accommodate all four types of operational modes currently identifiable in use, and should also be able to keep pace with technological innovation.[63]

4. Band Design Details

25. The *Second Notice* offered three alternative approaches to the task of determining an appropriate channel plan for the 700 MHz public safety band to address the communications needs of the public safety community. One approach would allow each of the RPCs complete freedom to independently decide how the 700 MHz band should be used in its region.[64] Under a second approach, the Commission would specify nationwide standards for the basic channelization for the band, but allow the RPCs to combine and/or split contiguous channels as needed to customize the national band plan to best meet the particular needs of their regions.[65] The third approach would be for the Commission to adopt a nationwide band plan mandating a specific channelization that would be used uniformly by all regions.[66] There is little support in the record for affording complete discretion over the design of the 700 MHz band plan to either the Commission or the RPCs. Instead, the comments generally support roles for both the Commission and the RPCs in establishing the band plan.

26. In regard to the portions of the band to be used for nationwide interoperability, we believe that we should set some of broad parameters for the band plan, such as the amount of spectrum to be devoted to interoperability and location in the spectrum of interoperability channels, and also to provide for a national coordinating body to determine and advise us as to more specific technical and operational requirements. Concerning the portion of the allocation designated for general public safety use, however, we agree with the commenters that neither of the exclusive approaches offered in the *Second Notice* would be appropriate. On one hand, giving the RPCs complete discretion could lead to vastly dissimilar usage patterns, resulting in fragmentation of the equipment market and conflicts between adjoining regions. On the other hand, denying

[61] *See, e.g.*, NTIA Comments at 9.

[62] Because we are limiting wideband channels to 150 kHz maximum bandwidth, use of full-motion, full screen video in the 700 MHz band will require the use of significant video signal compression.

[63] Although we conclude that it is not necessary for us to specifically identify particular channels to be used for each type of communications, we do separate the types into narrowband and wideband applications.

[64] *See Second Notice*, 12 FCC Rcd at 17,768-69.

[65] *See id.* at 17,766.

[66] *See id.* at 17,769-70.

the RPCs input as to how the spectrum will be used would deprive them of the ability to optimize efficient spectrum use by tailoring the band plan to more closely fit local needs. We are concerned that a fixed national band plan with no allowance for customization would deprive public safety entities of the flexibility needed to construct systems that will best meet their communications needs. Consequently, for the general use channels, we favor a joint approach, with the Commission setting only basic nationwide allocation and channelization standards, and the RPCs handling the detailed plans for use of the channels.

27. Accordingly, we will standardize only those aspects of band plan design that are necessary to avoid undue delays in equipment development, to ensure that the 700 MHz band will be able to support future communications technologies, to promote a competitive equipment market, and to provide for nationwide interoperability. Specifically, we are adopting rules that will determine the following: (1) channel pairing requirements; (2) the portion of the band to be used for narrow bandwidth applications; (3) the portion of the band to be used for wide bandwidth applications; (4) the amount of spectrum to be designated for national interoperability use; (5) the amount of spectrum to be initially provided for general (regional, local and/or statewide) use; (6) the minimum and maximum channel sizes for narrow and wide bandwidth uses; (7) spectrum usage efficiency standards for narrow and wide bandwidth applications; (8) a channel numbering system; and (9) the specific channels to be dedicated for national interoperability use. Other planning matters, such as the use of specific channels for particular public safety agencies, purposes or technologies will be determined by the RPCs as part of the regional planning process.

28. *Base/Mobile Pairing.* In the *Second Notice*, the Commission asked for comment on our proposal to designate 764-776 MHz (TV Channels 63 and 64) for base-to-mobile transmissions and 794-806 MHz (TV Channels 68 and 69) for mobile-to-base communications. In addition, the Commission proposed that base transmit channels in TV Channel 63 be paired with mobile channels in TV Channel 68 and likewise that base channels in TV Channel 64 be paired with mobile channels in TV Channel 69.[67] We noted that this would provide approximately 30 MHz separation between base and mobile transmit channel center frequencies. This was suggested because of the close proximity of TV Channels 68 and 69 to the 806-824 MHz band, which contains the transmit channels for mobile and portable radios operating in that band, which also use a 30 MHz separation. We anticipated that in the future, public safety equipment for this part of the spectrum could be designed to operate in both the 700 MHz and 800 MHz bands.

29. Most comments responding to these requests support the proposed channel pairing scheme.[68] One commenter, however, claims that a base/mobile pairing scheme is outdated by the more progressive block approaches for frequency management.[69] Another requests that non-standard pairing be allowed during the DTV transition period.[70] We continue to believe, nonetheless, that base/mobile pairing is essential to facilitating the rapid development of reasonably priced mobile and portable radios capable of operating in the 700 MHz band.[71] Because pairing provides simplicity and uniformity to band design, we anticipate that it will reduce costs for equipment manufactured to operate in this band. Therefore, we will, as proposed, require channel pairing.

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[67] *See Second Notice*, 12 FCC Rcd 17,778.

[68] *See, e.g.*, NPSTC Comments at 47; California Comments at 48-9; Long Beach, CA Comments at 5.

[69] *See* FLEWUG Comments at 23.

[70] *See* APCO Comments at 4.

[71] *See Second Notice*, 12 FCC Rcd at 17,778-79.

30. We recognize, however, that uniform pairing of base and mobile channels may not always be possible during the DTV transition period. For example, there are geographical areas where either licensed or otherwise protected full-service television stations are currently authorized to operate on TV Channels 63, 64, 68, and 69.[72] The occupation of one or more of the four TV channels may preclude pairing of the channels in accordance with our requirement. Furthermore, the use of TV Channel 69 may be contingent on some additional technical requirements necessary to prevent interference with an aeronautical navigation system used in the United States.[73] Therefore, to provide for cases where standard pairing is not practicable during the DTV transition period, we will allow the RPCs to pair base-to-mobile channels in TV Channel 63 with mobile-to-base channels in TV Channel 69 and/or base-to-mobile channels in TV Channel 64 with mobile-to-base channels in TV Channel 68. Because such non-standard channel pairing could cause some problems when the band becomes more fully occupied, we expect the RPCs to permit such non-standard channel pairing only when absolutely necessary, and we may require stations to return to standard channel pairing after the DTV transition period is over. Furthermore, we will not permit non-standard channel pairing on the nationwide interoperability channels in the 700 MHz band because of the need for nationwide uniformity of these channels. One additional detail that was not specifically mentioned in the *Second Notice*, but was mentioned in Motorola's comments,[74] is the question of whether we should allow mobile transmissions on any part of the 700 MHz band, not just the upper 12 MHz. We will allow this because, as some of the commenters note, it will facilitate direct mobile-to-mobile communications (*i.e.*, not through a repeater) that are often employed at the site of an incident, where wide area communications facilities are not available or desired. Also we note that allowing mobile transmissions on both halves of a paired channel is generally consistent with our rules governing use of other public safety bands.[75]

31. *Band Segments*. We turn now to the matter of establishing separate segments in the 700 MHz band for narrowband and wideband communications types. Initially, we note that Motorola, NPSTC, and Florida submitted comprehensive band plans.[76] For the purpose of these plans, these commenters generally combined the four types of communications into two categories: narrowband communications comprising voice and slow speed data ("integrated voice and data") and wideband communications comprising image/HSD and video. Separating narrowband from wideband removes an element of uncertainty as to the potential for adjacent channel interference, leading to less complicated frequency coordination requirements and more efficient use of the spectrum. We agree with this approach and for the purpose of putting compatible communications types together in band segments, we likewise are classifying the four communications types into two categories, narrowband and wideband communications. For the purpose of the 700 MHz public safety band, we define the narrowband category for integrated voice and data as any emission bandwidth less than or equal to 25 kHz. In similar fashion, we define the wideband category for image/HSD and video as any emission bandwidth greater than 25 kHz.

32. In their proposed band plans, Motorola and NPSTC generally agree that each of the four TV channels should be divided into three segments: narrowband channels for voice and data, wideband channels

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[72] *See Reallocation, Notice of Proposed Rule Making*, 12 FCC Rcd at 14,141, 14,177-78 and 14,182-83.

[73] *See* GLONASS and GPS discussion at paras. 200-205, *infra.*

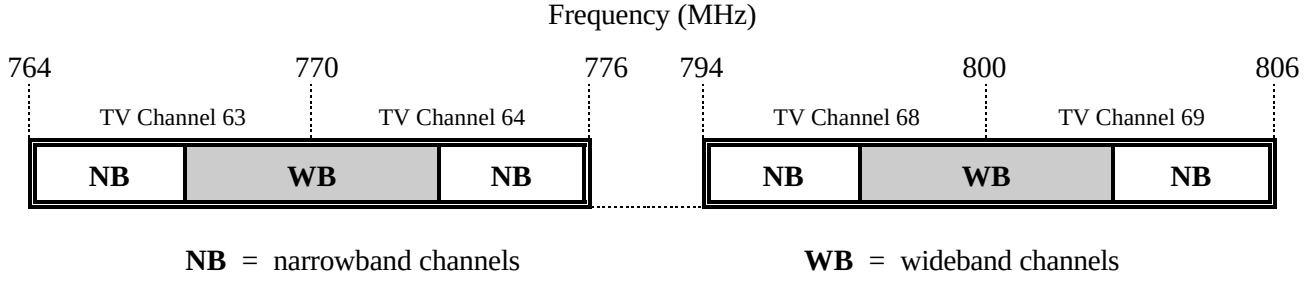
[74] *See* Comments of Motorola at 15.

[75] *See e.g.* "Class of Stations" column entry for the 851-859 MHz row in the table in § 90.20(c)(3) of the Commission's Rules.

[76] *See* Motorola Comments, Appendix at 4-7, NPSTC Comments Appendix A, and Florida Comments at 2-6.

for image/HSD and video, and a reserved block for future expansion of these two categories.[77] After reviewing the proposed band plans, we agree that a band layout similar to that suggested by NPSTC and Motorola is appropriate for the 700 MHz band. Because the near-term availability of the spectrum in the 700 MHz band for public safety use in any particular area will depend on the presence or absence of nearby operating TV broadcast facilities, we must assume that one or more of the four 6 megahertz TV channels may be unavailable to public safety entities in some cities during the DTV transition period. As suggested by the commenters, our band plan takes this into consideration by providing for each type of communications within each of the TV channels.

33. Within each of the four 6 megahertz TV channels, we designate two segments. One segment will be used for narrowband communications and the other will be used for wideband communications.[78] In recognition of the statutory deadline for the reallocation and adoption of service rules as directed by Congress, plus the public safety community's identification of an immediate need for an additional 25 MHz of spectrum for public safety services,[79] we believe that the bulk of the spectrum should be made readily available to the public safety community. We also believe that the public interest would be served by our consideration of other uses and licensing approaches for a certain portion of the 700 MHz band that may best serve other significant public safety purposes. Thus, we will designate 8.8 MHz of spectrum as "reserve," which will be subject to the *Third Notice*. Unlike the reserve spectrum designations in Motorola's and NPSTC's suggested band plans, the nature of such designations are not necessarily long-term but may in fact be short-term based on the comments received to the *Third Notice*. The 764-770 MHz (TV Channel 63) and 794-800 MHz (TV Channel 68) bands are arranged with the narrowband and wideband blocks laid out from lower to higher frequencies, while the 770-776 MHz (TV Channel 64) and 800-806 MHz (TV Channel 69) bands are the reverse of this, with the wideband and narrowband blocks laid out from lower to higher frequencies.[80] As noted by some of the commenters, this arrangement ensures that the wideband segment is not adjacent to non-public safety portions of the 700 MHz band.[81] This is important because the adjacent channel interference potential of wideband emissions has not yet been determined. A simplified chart of this band segmentation follows:



[77] *See* Motorola Comments at Appendix, page 4-7. *See also* NPSTC Comments at Appendix A.

[78] In the *Third Notice*, we seek comment on how to license the 8.8 MHz of reserve spectrum. *See Third Notice*, Section V(A), *infra*. In this *First Report*, for ease of reference and identification, we refer to this portion as the reserve spectrum.

[79] *PSWAC Final Report* at 3.

[80] This arrangement also allows for channel pairing.

[81] *See* NPSTC Comments at 16-17.

5. Channelization

34. *Channel Size and Spectrum Efficiency*. Many comments support having the Commission specify an assortment of channels of different sizes[82] and allowing the RPCs to "aggregate" and "disaggregate"[83] the channels to accommodate their needs.[84] The comments regarding the channel bandwidth for integrated voice and data were mixed. A few commenters suggest 25 kHz.[85] Others urge adoption of 6.25 kHz.[86] Most commenters favor 12.5 kHz channel size for voice and data applications.[87] Pennsylvania suggests that the spectrum be divided into narrowband channels, while allowing licensees to request assignments in wider channels if needed.[88] Ericsson and Motorola urge us to adopt a 6.25 kHz channel size with the ability to combine these narrow channels into larger channels in multiples of the 6.25 kHz channel.[89] Motorola suggests channelizing the whole 24 megahertz using 6.25 kHz spacing and combining contiguous groups of these narrow channels into wideband channels for image/HSD or video applications. Similarly, NPSTC advocates channelizing the whole band using 12.5 kHz channels and allowing these channels to be combined for medium or wideband data applications.

[82] There are complex mathematical relationships between various technical factors that determine what the minimum channel size must be in order to satisfy a particular communications requirement. These factors include, but are not limited to, the desired information transmission (data) rate, the required signal to noise ratio or bit error rate, the presence of signal fading, noise or interference on the channel, and the type of modulation and encoding used. Because it is an important specification for interoperability, the *Second Notice* focused mainly on channel spacing rather than channel size. However, as channel size and spacing are interrelated in the context of band planning, we address both herein.

[83] In this proceeding, the Commission as well as some of the commenters use the term "aggregating channels" to mean simply using two or more contiguous designated channels for a single emission where a particular application requires a larger bandwidth. Likewise, the term "disaggregating a channel" is used herein to mean transmitting two or more emissions within a single designated channel. The use of these terms is not intended to imply an assignment of license or transfer of control, as they generally do in reference to commercial wireless services.

[84] *See e.g.* Motorola Comments; Region 20 Comments at 14; Ericsson Comments at 18; John S. Powell Reply Comments at 34.

[85] *See e.g.* M/A-COM Comments at 3-5.

[86] *See, e.g.*, Association For Maximum Service Television, Inc. and National Association of Broadcasters (AMSTV/NAB) Reply Comments at 10; M/A-COM Comments at 3-5.

[87] *See, e.g.*, CA/PSRA Comments at 4; Florida Comments at 5; NPSTC Comments at 32; Ericsson Comments at 9 (also supports 25 kHz channel spacing); Powell Reply Comments at para. 34; AASHTO Reply Comments at 8.

[88] *See* Commonwealth of Pennsylvania (Pennsylvania) Comments at 16.

[89] *See* Motorola Comments at 15; Ericsson Comments at 9.

35. For wideband operations, Motorola suggests assigning the narrow channels in multiples of 100 kHz, while NPSTC prefers 125 kHz channels.[90] Florida suggests 150 kHz channels for wideband applications.[91] NPSTC and Florida also advocate a group of medium size channels (25 kHz) for data applications. All three would allow the RPCs to combine or split channels as needed.

36. As stated above, we believe that standardizing channelization on a national basis will provide for reasonably rapid development of a cost-based equipment market for the 700 MHz band, while local flexibility can be provided, as the commenters point out, by allowing combining of channels. We believe, however, that it would be inefficient to specify a single standard channel size for all types of communication without allowing some type of local flexibility. For this reason, we believe that the best approach is to specify a minimum channel size for narrowband communications, a second minimum channel size for wideband communications, and to allow the RPCs to combine these minimum size channels in specific ways, as needed.

37. Efficient spectrum use is another factor to be considered with regard to channelization of the 700 MHz band. The right to use a portion of the electromagnetic spectrum has proven in many cases to be a valuable commodity, but public safety entities are generally insulated from market forces in regard to acquisition of these rights.[92] While the public generally values public safety communications, their provision is not generally the result of market-driven forces. Instead, jurisdictions provide public safety communications to better protect the safety of life and property. How jurisdictions meet these needs may have more to do with budgetary considerations than considerations of what are the most efficient and effective technologies.[93] Therefore, we believe a technical standard is necessary and appropriate to ensure that the spectrum use within the 700 MHz band is efficient. For digital wireless telecommunications systems, spectrum use efficiency can be specified in terms of the data rate per unit bandwidth.[94] In the *Refarming Report and Order*, the Commission adopted a data rate efficiency of 4.8 kbps for 6.25 kHz equipment and the equivalent 9.6 kbps for 12.5 kHz equipment.[95] We believe this efficiency standard is also appropriate for public safety narrowband communications in the 700 MHz band. For digital voice and data transmissions, NPSTC recommends the equivalent 9.6 kbps for 12.5 kHz channels, 19.2 kbps for 25 kHz channels, and 384 kbps for 150 kHz channels.[96] We agree that a 384 kbps data rate, as recommended in the *PSWAC Final Report* for HSD and

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[90] NPTSC initially recommended 150 kHz as the maximum bandwidth, but on April 10, 1998, submitted a written *ex pate* submission that amended its comments with regard to wideband channels.

[91] *See* Florida Comments at 6.

[92] See e.g., 47 U.S.C. 309(J)(2) (1997) (Commission's competitive bidding authority shall not apply to licenses issued by the Commission for public safety radio services).

[93] *See* Amendment of Part 90 of the Commission's Rules to Provide for the Use of the 220-222 MHz Band by the Private Land Mobile Radio Service, *Memorandum Opinion and Order*, FCC 98-93 (rel. May 21, 1998).

[94] We express spectrum efficiency requirements in terms of a minimum data rate for a given channel size, e.g. 4.8 kilobits per second per 6.25 kHz.

[95] 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 Assignment Policies of the Private Land Mobile Services, PR Docket No. 92-235, *Report and Order and Further Notice of Proposed Rule Making*,10 FCC Rcd 10,076, 10,122 (1995) (*Refarming Report and Order*).

[96] NPSTC Comments at 32.

video, is appropriate for 150 kHz channels.[97] Certification of equipment designed for use in the 700 MHz band will be granted only if these guidelines for maximizing spectrum use are met.[98]

38. After full consideration of the record, we have decided to establish a standard channel bandwidth of 6.25 kHz for the narrowband segments. We fully expect that in the next few years it will be both technically and economically feasible to use these very narrow channels individually for certain applications such as digital voice and data. Until then, the RPCs will be allowed to combine these narrow channels like building blocks to create wider channels in two standard bandwidths, 12.5 kHz and 25 kHz, provided that a spectrum use efficiency of 4.8 kbps per 6.25 kHz is maintained.[99] We will not, however, authorize channels wider than 25 kHz in the narrowband segments of the 700 MHz band. Applications that require a larger bandwidth must be accommodated in the wideband segment, and meet the spectrum use efficiency requirement for the wideband segment. Allowing wideband applications in the narrowband channels would upset the initial balance of spectrum allocations we are establishing for these types of communications, and could cause the supply of narrowband channels to be depleted prematurely. Furthermore, we have concerns about whether wideband applications would cause adjacent channel interference and can successfully operate in channels that are adjacent to narrowband applications.[100]

39. Consistent with our narrowband approach, we are adopting a minimum "building block" channel size, which for the wideband segment will be a bandwidth of 50 kHz.[101] Although we are not currently aware of any wideband applications that can operate in this minimum channel size, it is likely that some wideband communications uses will exhibit an asymmetrical data flow (*i.e.*, much more data being transmitted on the downlink than the uplink). In such cases, it could be advantageous to use multiple 50 kHz mobile transmit channels for uplinks (or other purposes) and the paired wider base transmit channel for a common downlink.

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[97] *See* NPSTC Comments at 31-32. *See also PSWAC Final Report* at 231-32.

[98] In determining the data rate consideration will be given to the ratio between the bit rate and the symbol rate.

[99] The narrowband segment is divided into groups of two contiguous 6.25 kHz channels. Each channel may be combined only with the other channel within its group. In addition, only contiguous groups (of 4 channels) may be combined. *See* new § 90.531(e) for details. This will limit the number of possible channel center frequencies, simplifying equipment design and promoting a competitive market for equipment by ensuring that each manufacturer's equipment operates on the same set of channel center frequencies. Furthermore, it will eliminate the risk that "orphan" or guardband 6.25 kHz channels, which may not be usable, will be formed.

[100] Under our band plan, wideband and narrowband applications will be adjacent at only four channel boundaries.

[101] The record is mixed on the issue of wideband channel size. It appears, however, that some commenters' recommendations are based on the assumption that we will permit combining wideband channels to make very large channels. For example, Motorola recommends 100 kHz as a typical wideband channel size, but also shows possible combined channels of 200 kHz and 400 kHz. Motorola Comments, Appendix at 16.17. Ericsson in an *ex parte* filing, discusses the advantages of leveraging current research and development in commercial mobile technology by using "off-the-shelf" wireless standards such as GSM, that would require a 200 kHz or larger channel size. *See* letter to Magalie Roman Salas, Secretary, from Dr. Lars-Gorman Larsson, Ericsson, Inc., dated April 30, 1998 (Ericsson *ex parte* filing Number 1). NPSTC on the other hand does not propose channels wider than 150 kHz, stating that it does not believe that there is sufficient spectrum available in the new band to justify wider bandwidths for full-motion video. NPSTC Comments at 11. NPSTC later modified its original submission to request 125 kHz instead of 150 kHz as its recommended wideband channel size.

40. We also must provide for a wideband channel size sufficient to accommodate the principal wideband applications (image/HSD and video) envisioned for public safety use. We note that 150 kHz has been suggested as a minimum bandwidth necessary, given present data compression technology, to support the data rates required for applications such as slow motion video and rapid distribution of NCIC-2000 data.[102] We are concerned that NPSTC's late suggestion of 125 kHz may not have a mathematical basis, but may merely represent a compromise between its original position and that of Motorola, and be based on an overly optimistic view of future developments in data compression techniques. We do not believe that we can risk adopting a maximum wideband channel size that could later turn out to be insufficient to support wideband applications at a reasonable transmission speed. We also note that 125 kHz is not an integer multiple of the minimum channel size we are adopting today (50 kHz), which would complicate equipment design and channel numbering. For these reasons, we establish 150 kHz as the maximum wideband channel size.

41. We expect that the RPCs will ordinarily combine three adjacent 50 kHz "building block" channels in the wideband general use spectrum to achieve 150 kHz channels.[103] However, as with the narrowband segment of the 700 MHz band, we will, however, allow the use of one or two of these channels (50 kHz and 100 kHz channel bandwidths, respectively).[104] In any event, we are requiring that the equivalent of 384 kbps per 150 kHz spectrum use be maintained in order to ensure that the spectrum available for wideband applications is used efficiently. We will not permit combining the 50 kHz channels to make channels larger than 150 kHz in the wideband segments of the 700 MHz band because allowing a channel size that exceeds 150 kHz could significantly reduce the already limited number of wideband channel assignments possible in the band.

42. *Amount of Spectrum*. We now turn to the issues of how much spectrum and how many narrowband and wideband channels should be designated for nationwide interoperability and general use. Motorola, NPSTC, and Florida each suggest a specific amount of spectrum and number of channels for interoperability, general use and reserve.[105] A comparison of the these recommendations is shown in the table that follows:

[102] NPSTC indicates that it expects that a 150 kHz bandwidth channel will support a data rate of ¼ T1, which can provide image and slow motion video. NCIC 2000 is a system that will provide nationwide access for criminal justice agencies via wireline and wireless to the FBI's data bases, which contain information such as lists of stolen articles, wanted persons, fingerprints, mugshots. It can function at slower speeds, but faster delivery of large files is desirable to make best use of FBI resources. *See* NPSTC Comments at 13-14, 34-35.

[103] *See, e.g.*, NPSTC Comments at 32.

[104] The wideband segment is divided into groups of three contiguous 50 kHz channels. Each channel may be combined only with adjacent channels within its group. *See* new § 90.531(e) for details. This will limit the number of possible channel center frequencies, simplifying equipment design and promoting a competitive market for equipment by ensuring that each manufacturer's equipment operates on the same set of channel center frequencies. Furthermore, it will reduce the risk that "orphan" or guardband 50 kHz channels, which may not be usable, will be formed.

[105] *See* Motorola Comments, Appendix at 4-7, NPSTC Comments at Appendix A, and Florida Comments at 2-6.

Commenter's Suggested Spectrum & Channel Allocations

	Motorola	NPSTC	Florida
INTEROPERABILITY Narrowband Wideband Total	 80 x 6.25 = 0.5 -- **0.5 MHz**	 64 x 12.5 = 0.8 12 x 125 = 1.5 **2.3 MHz**	 120 x 12.5 = 1.50 8 x 150 = 1.2 **2.7 MHz**
GENERAL USE Narrowband Mid-size Wideband Total	 1520 x 6.25 = 9.5 -- 60 x 100 = 6.0 **15.5 MHz**	 800 x 12.5 = 10.0 -- 60 x 125 = 7.5 **17.5 MHz**	 776 x 12.5 = 9.7 24 x 25 = 0.6 48 x 150 = 7.2 **13.6 MHz**
RESERVE	**8 MHz**	**4.2 MHz**	**4.2 MHz**

43. We have evaluated the recommendations of the commenters in light of our decisions to designate a significant amount of spectrum for nationwide interoperability, to provide for both narrowband and wideband public safety communications, and to allow flexibility to permit effective regional planning. We conclude that a composite of the allocation plans submitted would provide the most appropriate balance between general use and nationwide interoperability spectrum, as well as between narrowband and wideband communications.[106] Our plan thus provides for 1920 narrowband (6.25 kHz) channels and 240 wideband (50 kHz) channels. The following table summarizes the spectrum and channel allocations we are adopting today together with those we propose in the *Third Notice* (which are indicated by the shaded areas in the table).[107]

FCC 700 MHz Public Safety Band Spectrum & Channels

Designated Purpose	Amount of Spectrum	Narrowband (6.25 kHz)	Wideband (50 kHz)
General Use	12.6 MHz (52.5 %)	7.8 MHz (1248 channels)	4.8 MHz (96 channels)
Nationwide Interoperability	2.6 MHz (10.8 %)	0.8 MHz (128 channels)	1.8 MHz (36 channels)
Reserved	8.8 MHz (36.7 %)	3.4 MHz (544 channels)	5.4 MHz (108 channels)
TOTAL	24 MHz (100 %)	12 MHz (1920 channels)	12 MHz (240 channels)

[106] The Motorola plan does not, in our estimation, provide enough spectrum for nationwide interoperability. The Florida plan (which does not appear to use the entire allocation) and NPSTC hold too little in reserve.

[107] A detailed channelization plan is given in Appendix H.

44. *Channel Numbering*. To avoid confusion in identifying channels that could be of several different sizes, we will show channel numbers instead of channel center frequencies in the rules we adopt today for public safety facilities in the 700 MHz band. Motorola suggests numbering 6.25 kHz channels in sequence of ascending frequency.[108] This appears to be a good approach, except that we see no purpose in numbering the wideband segment in 6.25 kHz increments when we have decided not to allow wideband channel sizes smaller than 50 kHz. Instead, we will number 50 kHz channels in the wideband segment. We will identify combined channels by their lowest and highest constituent channel numbers, separated by a hyphen. For example, a 150 kHz channel comprising wideband channels 1, 2 and 3 is designated as channel 1-3. The channel numbering scheme is detailed in new Section 90.531 (*see* Appendix E) and shown in the channelization plan (*see* Appendix H).

45. *Dispersion of Interoperability Channels*. For the interoperability spectrum, Motorola, NPSTC, and Florida recommend a distribution of narrowband and wideband channels throughout the whole 700 MHz band, rather than all together in one contiguous block. To minimize equipment costs, Florida also recommends that the channels be distributed to allow transmitter combining at no less than 250 kHz spacing between channels for integrated voice and data, and 450 kHz between channels for wideband data and video.[109] Motorola also indicates that it is desirable to separate interoperability channels by an amount adequate to allow low loss cavity combining.[110] NPSTC's detailed band plan shows three 12.5 kHz interoperability channels dispersed every 450 kHz throughout the narrowband segment, beginning 300 kHz above the lower band edge.[111] Motorola suggests that 4 contiguous 6.25 kHz interoperability channels be provided at 500 kHz intervals beginning at the lower band edge.[112] Motorola claims that this will provide better adjacent channel interference protection. Otherwise, the commenter's comprehensive plans propose similar channel separation and disperse the interoperability channels across the band in a similar way. In addition to the narrowband interoperability channels, NPSTC's plan suggests 12 wideband channels (150 kHz channel size) be designated for interoperability purposes, 8 for image/HSD plus 4 for video.[113]

46. The amount of spectrum that we have decided to designate for interoperability provides 128 narrowband channels (6.25 kHz channel size) and 36 wideband channels (50 kHz channel size). The dispersal pattern in the narrowband interoperability scheme we choose is similar to that recommended by NPSTC. The principal difference between NPSTC's plan and the one we adopt today is that NPSTC would have us designate specific purposes and service categories for many of the narrowband channels, whereas we have decided to designate only the channels that are to be used for nationwide interoperability, and to leave decisions as to earmarking the other channels for any specific purpose to the National Coordination Committee, States and/or RPCs. We also note that NPSTC's plan is based on a 12.5 kHz channel size, whereas the plan we adopt is based on a 6.25 kHz channel size. Because NPSTC's plan would allow splitting of the 12.5 kHz

[108] *See* Motorola Comments at Appendix, 14 and 22.

[109] Florida Comments at 2 and 6.

[110] A low-loss cavity combiner is a device consisting of low loss, high quality coaxial cavities that combine the outputs of two or more transmitters to produce a single output.

[111] *See* NPSTC Comments at Appendix pages 5 and 8.

[112] *See* Motorola Comments at Appendix page 8.

[113] *See* NPSTC Comments at Appendix pages 6 and 7.

channels into 6.25 kHz channels, this distinction is not of much importance. The specific interoperability channel numbers are provided in new rule Section 90.531 (*see* Appendix E).

B. ELIGIBILITY TO HOLD A LICENSE

47. The 1997 Budget Act directs the Commission, by January 1, 1998, to reallocate 24 megahertz of spectrum between 746 MHz and 806 MHz (inclusive) for public safety services.[114] We complied with this mandate in our *Reallocation Report and Order*. The 1997 Budget Act also directs the Commission to commence assignment of licenses for this reallocated spectrum by September 30, 1998. To commence the licensing process, we must first establish criteria for determining eligibility to hold a public safety license in the 700 MHz band.

[114] 1997 Budget Act. *See* 47 U.S.C. § 337(a)(1). The statute specified that the public safety reallocation would be according to the terms and conditions established by the Commission in consultation with the Secretary of Commerce and the Attorney General. *Id.* Section 337(a) also directed the Commission to allocate 36 MHz of spectrum between 746 MHz and 806 MHz for commercial use. *See* 47 U.S.C. § 337(a)(2); *see also Reallocation Report and Order*, 12 FCC Rcd 22,953.

48. Congress specifically defined the "public safety services" that are intended to benefit from this spectrum allocation. Section 337(f) of the Communications Act defines the term "public safety services" as

> services-
> (A) the sole or principal purpose of which is to protect the safety of life, health, or property;
> (B) that are provided—
> (i) by State or local government entities; or
> (ii) by nongovernmental organizations that are authorized by a governmental entity whose primary mission is the provision of such services; and
> (C) that are not made commercially available to the public by the provider.[115]

Accordingly, we adopt the following 3-pronged test for determining eligibility for use of the 700 MHz public safety allocation and is directly based on the definition of public safety services contained in Section 337(f)(1) of the Communications Act.

Three Pronged Test

1. Purpose of Spectrum Use
2. Identity of Licensee

1. Purpose of Spectrum Use

49. Section 337(f) requires spectrum in the 700 MHz band to be used for services, the sole or principal purpose of which is to protect the safety of life, health, or property.[116]

2. Identity of Licensee

50. *State or Local Governments and Nongovernmental Organizations*. Under the statutory definition of public safety services, the spectrum is to be used by "State or local government entities" and "nongovernmental organizations that are authorized by a governmental entity" whose primary mission is the provision of services, the sole or principal purpose of which is to protect the safety of life, health, or property.[117] Based on its tentative conclusion that the 1997 Budget Act and Section 337 limited licensing to

[115] 47 U.S.C. § 337(f)(1).

[116] *See* 47 U.S.C. § 337(f)(1)(A). For brevity, we refer to these services herein as "public safety services."

[117] See 47 U.S.C. § 337(f).

entities whose sole or principal purpose is to protect the safety of life, health, or property,[118] the Commission proposed the following eligibility criteria in the *Second Notice*:

> Public Safety Service Provider: (1) A State or local government entity that provides public safety services; or (2) a non-governmental organization that is authorized to provide public safety services by a governmental entity pursuant to Section 337(f)(1)(B)(ii) of the Communications Act.[119]

51. The Commission observed that two groups fit within this definition: (1) governmental public safety services providers, and (2) nongovernmental public safety services providers authorized by governmental entities.[120] The Commission also recognized that other entities with public safety responsibilities, with which eligible entities might need to communicate by radio, did not fall within the definition.[121] The Commission proposed having each regional plan specify the precise types of groups, falling within its definition, that would be eligible to receive frequencies,[122] and asked if additional rules were needed either for eligibility or for applications submitted by nongovernment organizations.[123]

52. With regard to the spectrum in the 700 MHz band governed by Section 337, most commenters disagree with the "narrow" definition proposed in the *Second Notice*, and favor adoption of eligibility criteria based on the PSWAC definitions of public safety and related service providers to the extent possible under the statute.[124] AMSTV/NAB, however, would limit eligibility to law enforcement, fire fighters, and emergency

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[118] *See Second Notice*, 12 FCC Rcd at 17,741-42, 17,761-62 *citing* 47 U.S.C. § 337(f)(1). In the *First Notice*, the Commission proposed terms and definitions related to eligibility for public safety spectrum including "Public Safety," "Public Safety Services," "Public Safety Services Provider," "Public Safety Support Provider," and "Public Services." *See First Notice*, 11 FCC Rcd at 12,470. The *PSWAC Final Report* adopted these definitions. *PSWAC Final Report* at 45.

[119] *See id. citing* 47 U.S.C. § 337(f)(1)(B)(ii).

[120] *See Second Notice*, 12 FCC Rcd at 17,742.

[121] *Id.*

[122] *See Second Notice*, 12 FCC Rcd at 17,762 *citing National Plan Report and Order*, 3 FCC Rcd at 905.

[123] *See Second Notice*, 12 FCC Rcd at 17,741-42, 17,761-62 *citing* 47 U.S.C. § 337(f)(1)(B)(ii). If NGOs provide "public safety services" and are authorized by a government agency whose primary mission is the provision of such services, the Commission proposed that authorized NGO providers should not be treated as guest entities on interoperability channels, but should instead be treated as being among the public safety service providers for whom interoperability channels are specifically intended. *Id.* at 17,747.

[124] APCO Comments at 14-16; NY Transit Comments at 1-2; IACP Comments at 2; Little Rock Reply Comments at 1; FLEWUG *ex parte* letter, filed April 29, 1998. Eligibility criteria based on the PSWAC definitions would confer licensing eligibility on Federal, state, and local governmental entities; Section 337(f)(1)(B), however, does not list Federal entities. IACP, for example, states that the PSWAC recommendations were developed by a broad representation of public safety interests, and represent the most appropriate solutions for public safety communications. *See* IACP Comments at 2. NPSTC adds that the PSWAC definitions provide a clear, all-inclusive basis for national, state and local interoperability plans whereas the "narrow" definition proposed in the *Second Notice* could leave unclear the governmental functions that are included, which would delay licensing. *See* NPSTC Reply Comments at

rescue services, asserting that a broader definition would put these "traditional" public safety users in competition for scarce spectrum with entities that are not critical to public safety efforts.[125] AMSTV/NAB also express concern about minimizing both the number of licensed entities that television broadcasters would have to protect and the sources of potential interference to broadcast television.[126]

53. The rules and policies that we are adopting today include "bright line" application processing criteria, based on the type of entity applying for a license, and consistent with the statutory definition of the services for which this spectrum is to be used. We believe that establishing "bright line" criteria promotes consistent, predictable, and efficient licensing.

54. First, we conclude that state or local government entities are eligible for licensing in the 700 MHz band without further showing as to eligibility.[127] We acknowledge, in this regard, our departure from the *Second Notice's* tentative conclusion that certain state and local government entities would be ineligible for licensing under the statutory definition of public safety services.[128] We are adopting a more inclusive interpretation today because, as suggested by many commenters, the more inclusive definition better reflects the statutory intent.[129] In addition, among the providers of public safety services listed in the statute, state and local governments are referenced first and apart from NGOs.[130] NGOs must also be authorized by "a governmental entity whose *primary* mission is the provision of such services."[131] We believe our revised approach gives meaning to the distinction that Congress made between eligible "State and local governments"[132] and the narrower subset of governmental entities with a primary mission of providing public safety services from which NGOs need authorization.[133] We emphasize, however, that eligibility to use this spectrum is governed by Section 337 of the Act in all aspects; thus, these application processing standards are rebuttable

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[125] AMSTV/NAB Reply at 9.

[126] *See, e.g.*, AMSTV/NAB Comments at 7.

[127] One commenter argues, for example, that it is critical that the majority of new licenses be limited to state and local government agencies because these agencies currently suffer from a multitude of problems that exist in the current public safety spectrum. *See* Ft. Lauderdale Reply Comments at 1. *See also* UTC Comments at 3 (UTC recognizes that th[e] narrow definition of public safety services in . . . Section 337 . . . generally would not include utilities and pipelines).

[128] *See Second Notice*, 12 FCC Rcd at 17741-42 (tentatively concluded that state or local governmental entities would be ineligible unless principal purpose of entity is the protection of the safety of life, health or property).

[129] Several commenters argue that licenses for this spectrum should be held only by state and local governmental entities or, along the same line, that all state and local governmental entities are eligible for licensing under the statutory definition. *See e.g.*, APCO Reply Comments at 13; Powell Reply Comments at paras. 12-14.

[130] *See* 47 U.S.C. § 337(f)(1)(B)(i).

[131] *See* 47 U.S.C. § 337(f)(1)(B)(ii) (*emphasis added*).

[132] 47 U.S.C. § 337(f)(1)(B)(i).

[133] 47 U.S.C. § 337(f)(1)(B)(ii).

presumptions. We also emphasize that although the statute does not require licensees to have the sole or principal purpose of providing public safety services,[134] Section 337 mandates that this spectrum must be used for *services* whose sole or principal purpose is to protect the safety of life, health or property.

55. In light of these distinctions, we conclude that NGOs are also eligible for licensing in the 700 MHz band if approved by an appropriate state or local government entity.[135] Most commenters agree with this approach.[136] APCO argues, however, that licenses generally should be held only by state and local government entities because NGOs only meet the definition if their purpose is providing services authorized by a state or local government that protect the safety of life, health, or property.[137] API and Compu-Dawn counter that the plain language of the statute requires the Commission to receive applications from and consider granting licenses to NGOs.[138] We concur with API and Compu-Dawn that Section 337 also contemplates licensing of NGOs in the 700 MHz band.

56. Thus, we conclude, based on the definition in the 1997 Budget Act for "public safety services," that NGOs are eligible for licensing in the 700 MHz band when expressly authorized by a state or local governmental entity whose mission is the oversight of or provision of such services.[139] To implement this provision of the statute, NGO applicants must submit a written statement by the state or local governmental entity that is authorizing the NGO to use 700 MHz band spectrum, and the authorizing state or local governmental entity's authorization must certify that its mission includes oversight of or responsibility for providing public safety services. An NGO Neighborhood Watch,[140] for example, would probably seek written authority from the local police department but there are countless variations on how NGO use might present itself among states and localities nationwide. We believe that the certification from one of our licensees provides a reasonable measure of confidence that the NGO has received authorization from a governmental entity that is appropriate under the circumstances.

57. Some commenters disagree whether NGOs should be required to obtain governmental support for their 700 MHz applications in order to be eligible for licensing.[141] While it is true that the statute does not

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[134] *See* 47 U.S.C. § 337(f)(1). *Compare*, 47 U.S.C. § 336(a)(1) (1996) (Commission should limit initial eligibility for advanced television licenses to certain "*persons*").

[135] *See* 47 U.S.C. § 337(f)(1)(B)(ii).

[136] *See e.g.*, API Reply Comments at 3-4. *See also* Region 20 Comments at 7-8.

[137] *See* APCO Reply Comments at 13.

[138] *See* Compu-Dawn Reply Comments at 4-6. API states that authorized NGOs providing appropriate services are eligible for licensing under the plain language of the statute. *See* API Reply Comments at 5.

[139] *See* 47 U.S.C. § 337(f)(1)(B)(ii).

[140] *See, e.g., Neighborhood*, National Crime Prevention Council Internet site: <http://www.ncpc.org/neigh.htm>.

[141] APCO and NPSTC, for example, contend that an NGO's agreement to assist a government agency's public safety operations does not constitute the governmental authorization that NGOs need to be eligible for licensing. *See* APCO Reply Comments at 14; NPSTC Comments at 23. Compu-Dawn counters that the "plain language" of the statute requires the Commission to consider granting licenses to NGOs that enter such agreements with public safety agencies.

expressly state that NGOs must obtain formal governmental approval to be licensed in the 700 MHz band,[142] we believe that the above-described approach ensures that licensing of NGOs is consistent with the statutory requirements in a manner that minimizes information collection, submission, and other burdens for all interested parties. We note that this approach is consistent with our eligibility rules for public safety spectrum allocated prior to the 1997 Budget Act, where NGOs generally received some type of approval from state or local government entities before being licensed on such spectrum.[143] We also recognize that governmental authorities effectively have veto power over NGO applications for the 700 MHz band because NGOs need appropriate governmental authorization in order to be deemed eligible to receive a license.[144] Thus, under the rules we adopt today, NGOs are required to obtain written consent for their 700 MHz band applications, *i.e.*, initial, assignment, and transfer -- directly from the state or local governmental entity that authorized the NGO to provide public safety services. For application processing purposes, so long as the NGO applicant submits the required written authorization of such a state or local governmental entity, we will deem these provisions satisfied.

58. In sum, NGOs are eligible to be licensed for spectrum in the 700 MHz band that will be used for services, the sole or principal purpose of which is to protect the safety of life, health or property so long as state or local governmental authorization, from a primary mission provider, exists.[145] To codify this policy and clarify that it applies to all NGO applications and licenses, both initially and on an ongoing basis, the rules we adopt today include a provision that expressly conditions[146] all 700 MHz band licenses issued to NGOs as follows:

See Compu-Dawn Reply Comments at 4-6.

[142] *See* 47 U.S.C. § 337(f).

[143] *Refarming Report and Order*, 12 FCC Rcd at 14319 (eligibility for licensing in Public Safety Pool below 512 MHz is typically established by governmental status of applicant; NGOs almost always need governmental approval to be licensed). When our rules conflict with the statute they must yield. For example, NGO special emergency entities are eligibility without governmental approval for licensing on specific frequencies within the Public Safety Pool below 512 MHz. Without governmental approval, these special emergency NGOs are not eligible for licensing in the 700 MHz band because Section 337 requires all NGOs to be authorized by an appropriate governmental entity.

[144] *See* 47 U.S.C. § 337(f)(1)(B)(ii).

[145] APCO argues that NGO licenses should be conditioned on use only for activities involving the protection of safety, life, health or property, and continued governmental authorization. *See* APCO Reply Comments at 13.

[146] *See generally, AAT Electronics Corp.*, 93 FCC 2d 1034 (1983), *P & R Temmer*, 93 FCC 2d 1051 (1983), both *aff'd sub. nom., P & R Temmer v. FCC*, 743 F.2d 918 (D.C. Cir. 1984).

> "This authorization is granted subject to the condition that frequencies in the 764-776 and 794-806 MHz bands shall be used exclusively for public safety services, *see* 47 U.S.C. § 337. If at any time the State or local governmental entity that authorized the applicant/licensee cancels, revokes, or terminates its authorization of the applicant/licensee: (1) in the case of an applicant, such applicant's pending application shall be dismissed automatically; and (2) in the case of a licensee, such licensee's authorization shall terminate automatically and immediately revert to the Commission."

In the event that factual or legal disputes arise between NGOs and "supporting" governmental entities, the NGO will bear the burden of proof. Similarly, if another governmental entity challenges the accuracy of an NGO applicant's state or local government authorization, the NGO bears the ultimate burden of proof. If, however, another NGO challenges the state or local government authorization, the challenging NGO bears the burden of proof.

59. If a governmental entity rescinds its authorization and the safety of the public requires immediate suspension of the NGO's 700 MHz band operation, the governmental entity should notify the Commission directly in writing. It is probable that governmental entities will need to communicate with NGOs that they authorize; they also have a strong interest in ensuring that NGOs use public safety spectrum properly.

60. *Licensed Federal Use of 700 MHz Band Spectrum*. The Commission also tentatively concluded in the *Second Notice* that Federal government entities were not eligible to be licensed to use the general use spectrum because Section 337 refers to State and local government entities, and NGOs that are authorized by appropriate governmental entities, but does not reference Federal entities.[147]

61. Several commenters, including FLEWUG and NPSTC, argue that licensing Federal entities in the 700 MHz band is essential to promoting interoperability and other important goals of this proceeding.[148] Along this line, NTIA states that Congress required the Commission to consult with the Secretary of Commerce and the Attorney General in the reallocation of the 700 MHz band spectrum because it recognized the vital role that Federal agencies play in providing public safety related services to the American people.[149] As noted above, many commenters generally support the definitions in the *PSWAC Final Report*, which include Federal agencies.[150]

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[147] *See* 47 U.S.C. § 337; *see also Second Notice*, 12 FCC Rcd at 17,746-47.

[148] *See, e.g.*, FLEWUG ex *parte* letter, filed April 29, 1998 (FLEWUG seeks licensing of federal agencies on interoperability channels but not for general use spectrum); NPSTC Comments at 20-21; California Comments at 34-39. NPSTC also recommends that Congress amend the statute appropriately if Section 337(f) prohibits adoption of the entire *PSWAC* definition because the statutory definition is too limiting in scope and too broad in application. *See* NPSTC Comments at 20-21.

[149] NTIA Comments at 5. Powell opposed federal entities holding licenses but would allow federally chartered organizations, *e.g.*, ARINC, to hold a license. *See* Powell Reply Comments at paras. 12-14.

[150] *See supra* para. 54.

62. While Congress directed the Commission to consult with the Secretary of Commerce and the Attorney General regarding the public safety allocation,[151] we cannot conclude that Congress authorized the Commission to read this consultation provision as an implied exception to express provisions of Section 305 of the Communications Act of 1934, as amended.[152] Section 305 of the Act precludes the Commission from licensing stations belonging to and operated by the United States. Section 305 provides in part:

> [R]adio stations belonging to and operated by the United States *shall not* be subject to the provisions of sections 301 [Commission's licensing authority] and 303 [Commission's general powers] of this Act. All such Government stations *shall* use such frequencies as shall be assigned to each or each class by [NTIA].[153]

If Congress had intended to create an exception to the licensing provisions of Section 305 of the Act, it could have done so explicitly. In the absence of an explicit statement, we must look to the legislative history and context of Congress' action to discern whether it meant to create an implied exception. Based on our review of the legislative history, there is no evidence that Congress intended to create in the 1997 Budget Act an implied exception to NTIA's authority to assign all frequencies to be used by Federal entities as set forth in Section 305 of the Act.

63. *State/Local Governmental Licensees Allied with Federal Public Safety Service Providers*. Another scenario where the statute is silent arises when state or local governmental licensees want to approve shared use of their Commission licensed frequencies by Federal public safety service providers. As discussed immediately above, we find no basis for concluding that, in empowering state and local governmental entities as to NGO licensing, Congress intended Section 337(f) to eliminate state and local government licensees' from voluntarily requesting authority for a Federal provider of public safety services to use frequencies for which the state or local entity is licensed.

64. The Commission tentatively concluded in the *Second Notice* that public safety service providers that are eligible for licensing in the 700 MHz band would be required to communicate with their ineligible Federal counterparts. The Commission sought comment as to how the Table of Allocations may need to be revised to permit Federal use and whether permitting such use would be consistent with Congressional objectives in adding Section 337 of the Communications Act.[154] The Commission also tentatively concluded that the orderly and effective use of interoperability channels would require that *all* users — state, local and Federal; governmental and non-governmental; those entities that are eligible by definition and those entities that

[151] *See* 47 U.S.C. § 337(a)(1).

[152] Section 305 of the Communications Act of 1934, as amended (the Act), 47 U.S.C. § 305; *see also* 47 U.S.C. §§ 901-904 (NTIA Organization Act).

[153] 47 U.S.C. § 305 (*emphasis added*). " [U]se of the radio frequency spectrum for radio transmissions for telecommunications or for other purpose shall be made by United States Government stations only as authorized by the Assistant Secretary [of Commerce]. *See* Section 7.0, NTIA Manual of Regulations & Procedures for Federal Radio Frequency Management (Edition 9/95, with Revisions for September 1996, January and May 1997) (NTIA Manual).

[154] *See Second Notice*, 12 FCC Rcd at 17,747 *citing PSWAC Final Report* at 313.

may be eligible as guests — should be entitled to use the interoperability channels *only* in accordance with the interoperability plan.[155]

65. The record before us reflects overwhelmingly that Federal entities provide noncommercial services the sole or principal purpose of which is to protect the safety of life, health, or property. As noted above, for example, most commenters support the PSWAC definitions, at least to the extent allowed under the statute, because these definitions include Federal entities among providers of public safety services.[156] Many commenters also state that allowing Federal entities to access the 700 MHz band is essential to promoting interoperability and other important goals of this proceeding.[157]

66. Although the statute does not refer to Federal entities,[158] we agree with NTIA that Section 337 does not bar Federal entities from use of the 700 MHz band.[159] We believe the omission simply reflects the fact that the Commission does not license Federal stations. Likewise, the omission of Federal entities in the definition of public safety services does not mean that Congress rejected the *PSWAC Final Report*'s conclusion that Federal public safety entities are integral members of the public safety community.[160] Rather, as NTIA and FLEWUG argue, the statutory definition is necessarily framed around the Commission's licensing powers[161] and, as such, the omission of Federal entities is only relevant for licensing purposes; it does not mean that Congress determined that Federal agencies do not provide services the sole or principal purpose of which, is to protect the safety of life, health or property. This conclusion is also supported by the fact that the statute defines services, not entities.[162]

67. In the United States, radio spectrum may be allocated exclusively or for shared use to either government (Federal government) or non-government (state/local governments and civilians). Spectrum in the

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[155] *See id.* at 17,748.

[156] *See infra* para. 54.

[157] *Id.* Commenters generally support allowing Federal public safety providers the use of interoperability channels. *See* FLEWUG Comments at 14; NTIA Comments at 4-6; NPSTC Comments at 24-25; NYS Police Comments at 3-4; AWWA Comments at 2; UTC Reply Comments at 2-4; APCO Comments at 14-16; IACP Comments at 5 (eligibility of entities entitled to operate in 700 MHz band should include wide range of public safety and government public service entities).

[158] *See* 47 U.S.C. § 337.

[159] *See* NTIA Comments at 5. Noting that Section 337(b)(1) directs the Commission to "commence assignment of the licenses for public safety services" within a certain time frame, NTIA avers that Congress defined "public safety services" in such a way as to be consistent with the Commission's authority to assign licenses only to state and local government entities and nongovernmental users, thus preserving NTIA's role as the spectrum manager for Federal agencies. *Id.*

[160] FLEWUG Reply at 6-7; *see also* NYS Police Comments at 3-4.

[161] *See e.g., infra* note 152 and accompanying text and *supra* note 159.

[162] *See supra* para. 56.

700 MHz band is allocated exclusively for non-government assignments.[163] Federal government stations, however, may be authorized to use non-government frequencies, under Section 2.103 of our rules,[164] if the Commission licensee(s) supports the Federal use and certifies that it is necessary for the coordination of Federal government and non-Federal government activities.[165] Requests for Federal use of 700 MHz band frequencies must be filed with the Commission by the state or local governmental licensee (for the 700 MHz band frequencies involved) that supports the Federal use. Additionally, Federal entities must submit their requests to use non-Government spectrum with NTIA in accordance with Section 305 of the Act.[166]

68. Although we conclude herein that Federal entities are ineligible for Commission licensing in the 700 MHz band, they are eligible to receive authorization to use this spectrum in accordance with the requirements set forth in Section 2.103 of our rules for Government use of non-Government spectrum. This use of the 700 MHz band by Federal public safety providers falls within the reasonable interpretation of the uses for which the spectrum is allocated because such use will benefit, support, and in some cases be critical to, the successful provision of public safety services by Commission licensees.[167] It also generally is consistent with the consultation provision of Section 337.[168] This process is also consistent with Section 337 because a state or local governmental licensee must agree to the Federal use of its licensed frequencies. We are adopting conforming revisions to Section 2.103 to clarify the Commission's standards for this process for spectrum governed by Section 337 of the Act.

69. In sum, if a state or local governmental licensee desires for a Federal public safety entity to receive access to some or all of its licensed frequencies, the licensee can join in the request, under the NTIA/FCC process, to authorize Federal use of its non-government frequencies for noncommercial public safety services. In addition, NTIA's comments in this proceeding express strong approval of this Federal use of non-government frequencies. We observe that there may be benefits to providing for the adoption of a single, "blanket" authorization that would confer NTIA's authorization to all Federal entities as described in Section 2.103 of the Commission's Rules.

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[163] *See* 47 C.F.R. § 2.106; NTIA Manual § 4.1.3. *See also Reallocation Report and Order*.

[164] 47 C.F.R. § 2.103.

[165] If the Commission concurs with the licensee's request, the Federal entity's use of the non-Government spectrum must not cause harmful interference to non-Federal Government stations and must be in accordance with the Commission's service rules as well as any conditions agreed upon by the Commission and NTIA.

[166] *See* NTIA Manual §§ 4.1.2 (a Government frequency assignment may be authorized in a non-Government band, as an exception to the Table of Allocations, provided the assignment is coordinated with the FCC and no harmful interference will be caused to the service rendered by non-Government stations, present or future), 7.12 (Use of Frequencies Authorized to Non-Government Stations Under Part 90 of the FCC Rules), 8.3.3 (Coordination of Frequencies Used for Communication with Non-Government Stations Licensed Under Part 90 of the FCC Rules).

[167] Put differently, these alliances are consistent with Section 337 because the allied use of the spectrum can fairly be said to be “for” the public safety services for which this spectrum is allocated.

[168] NTIA states that Congress required the Commission to consult with the Secretary of Commerce and the Attorney General in the reallocation of the 700 MHz band spectrum because it recognized the vital role that Federal agencies play in providing public safety related services to the American people. *See also* WT Docket No. 96-86, e*x parte Letter* filed with the Commission on July 22, 1998, from Janet Reno, Attorney General, and William M. Daley, Secretary of Commerce, to the Honorable William E. Kennard, Chairman, FCC.

70. *Section 337 Statutory Eligibility; Relation to PLMR Sharing.* While Section 337(f) requires the spectrum to be used for public safety services and sets forth the statutory prerequisites of *licensed* state and local governmental and NGO use, the statute is silent as to the permissibility of state or local government licensees allowing shared use of their licensed frequencies for noncommercial public safety services. If our existing private land mobile radio (PLMR) "sharing" rules apply to 700 MHz band licensees, one sharing scenario will likely occur when a state or local governmental licensee has declined to authorize NGO licensing but agrees to permit the NGO to share the use of its licensed system.[169] We find no basis for concluding that in empowering state and local governmental entities as to NGO licensing Congress intended Section 337(f) to eliminate state and local licensees' privilege, under our current rules, to share their licensed systems with unlicensed entities for noncommercial public safety services. As such, we are extending the scope of our PLMR sharing rules and policies to include state and local governmental licensees in the 700 MHz band. In accordance with Section 337(f)(B)(ii), NGO licensees in the 700 MHz band may share their licensed frequencies with noncommercial public safety service providers only with the express written approval of the authorized governmental entity. This approval requirement ensures that NGO licensees operate within the scope of the permission conferred by the authorized governmental entity and joins any issues before a disapproved use of the spectrum occurs, thereby avoiding automatic cancellation of the NGO's conditional license.

3. Noncommercial *Proviso*

71. Under the statutory definition of public safety services, the spectrum cannot be used for services to protect the safety of life, health, or property, that the provider "makes commercially available to the public."[170] Accordingly, the Commission tentatively concluded in the *Second Notice* that entities not eligible for licensing on this spectrum included government or NGOs in the context of public safety services that they make commercially available to the public.[171]

72. We adopt this tentative conclusion and confirm that potential applicants, whether state or local government entities or NGOs, may not claim eligibility for licensing in the 700 MHz band on the basis of public safety services[172] that they make commercially available to the public. Because the statute defines the public safety services, and not the entities, for which the spectrum is allocated, we also note that commercial providers of public safety services are not barred, *per se*; thus, these entities could be eligible for NGO licensing under particular circumstances — but only in connection with providing public safety services that they do not make commercially available to the public.[173] As such, we disagree with APCO's conclusion that

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[169] For example, a local police department licensee may decline to authorize NGO licensing for an NGO that assists with security services during an annual, two-week local fair. Under 47 C.F.R. §§ 90.179, 90.421, the local police department can allow the NGO to share the use of its (the police department's) licensed system by issuing handheld units for its system to the NGO for use for the duration of the annual fair.

[170] *See* 47 U.S.C. § 337(f)(1)(C).

[171] *See Second Notice*, 12 FCC Rcd at 17,741-42. The Commission also tentatively concluded that state and local governmental entities, the sole or principal purpose of which is *not* to protect the safety of life, health, or property, were ineligible. *Id.* We are not adopting this tentative conclusion. *See supra*, para. 56.

[172] *See* 47 U.S.C. § 337(f)(1)(A).

[173] *See* 47 U.S.C. § 337(f)(1)(C). *Accord* Compu-Dawn Reply at 4-5. Appropriate governmental approval is required for NGOs in all events. If a state or local governmental licensee needs to communicate by radio with a

commercial entities are ineligible in all events because their principal purpose is not the protection of the safety of life, health, or property.[174] In connection with UTC's observation that the "narrow" definition in the statute generally does not include utilities and pipelines, we note that entities are not disqualified, *per se*, by their commercial status.[175] For example, a commercial utility company, with appropriate governmental authorization, is eligible to hold licenses for spectrum in the 700 MHz band for use when it provides services to protect the safety of life, health or property that it does not make commercially available to the public.[176]

C. ADMINISTRATION

1. Interoperability

73. The band plan that we adopt in this *First Report* designates specific channels (representing approximately 10 percent of the 700 MHz public safety band) for interoperability communications. As a general matter, interoperability refers to the ability of units from two or more government agencies to interact with one another and exchange information.[177] In this subsection of the *First Report*, we adopt general guidelines for operation and use of the spectrum dedicated to interoperability.[178]

74. Public safety agencies have traditionally operated their own systems using frequencies and equipment that are not necessarily compatible with those used by other agencies. In the *First Notice* and *Second Notice*, the Commission discussed the need for interoperability in public safety communications in the general contexts of mutual aid incidents, emergency aid incidents or task force operations, and day-to-day operations.[179] The Commission observed that interoperability must often be established during emergencies and under conditions that allow little opportunity for prior planning; that communications must often be established among numerous smaller groups, each with its own talk group; and that, once responders are on the scene, mutual aid interoperability usually involves the use of portable radios.[180] The Commission also noted

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commercial provider of public safety services that is ineligible for licensing, an operational solution may be permissible under our rules. *See* 47 C.F.R. § 90.421.

[174] APCO Reply Comments at 14 .

[175] *See* UTC Comments at 3. UTC also argues that licensing utilities and pipelines on interoperability channels would comport with Congressional intent. *See id*. at 3-6 *citing* Section 3002(a)(2)(A) of the 1997 Budget Act, which amended 47 U.S.C. § 309(j)(2) to add an exemption from auctions for public safety radio services, including private internal radio service used by non-Government entities that protect the safety of life, health, or property. UTC adds that the Commission should initiate a rulemaking to allocate spectrum for interoperability among utilities and pipelines. *Id*. at 4-10. UTC's request is beyond the scope of the *Second Notice* and thus also beyond the scope of this *First Report*.

[176] In cases where utilities or pipelines are ineligible for licensing, governmental authorization notwithstanding, we note that operational options may be available under Section 90.421 of our rules, 47 C.F.R. § 90.421.

[177] *See e.g., Second Notice,* 12 FCC Rcd at 17,719; *PSWAC Final Report* at 69.

[178] We note that the issue of interoperability channels is addressed in the *Third Notice*. *See* Section V, *infra.*

[179] *First Notice*, 11 FCC Rcd at 12,472.

[180] *Second Notice* 12 FCC Rcd at 17,721; *PSWAC Final Report* at 48.

that emergency preparedness involves planning for disaster relief that may include many public safety agencies from various jurisdictions.[181] Task forces also typically involve agencies from many disciplines and jurisdictions, and thus require interoperable communications systems; they also frequently deploy emergency operations centers, establish on-scene command posts, and dispatch units throughout a wide area.[182] The Commission also noted that day-to-day operations are those requiring routine communications capabilities, as when personnel in adjoining jurisdictions, or within different disciplines in the same jurisdiction, need to exchange information and that, typically, these requirements are local or regional, as when agencies with concurrent jurisdiction need to monitor each other's routine traffic.[183]

75. In the *First Notice*, the Commission proposed a formal definition of interoperability and related definitions that at the time were under consideration by the Interoperability Subcommittee of PSWAC.[184] These definitions were ultimately adopted by PSWAC and included in the *PSWAC Final Report*.[185] In the *Second Notice*, the Commission stated that a primary goal with respect to interoperability should be seamless interoperability on a nationwide basis.[186] Towards attaining this important goal, the Commission also tentatively concluded in the *Second Notice* that the earlier-proposed definitions should be adopted.[187] Commenters to the *Second Notice* generally support the adoption of these proposed definitions.[188]

76. Based on the record before us, we now confirm the definition for interoperability. We anticipate that this definition will serve as the framework that the National Coordinating Committee will follow as it adopts guidelines for more specific interoperability standards and protocols.[189] Specifically, we adopt the following definition for interoperability:

- *Interoperability*: An essential communications 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.

2. Regional Planning

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[181] *Second Notice* 12 FCC Rcd at 17,721; *First Notice*, 11 FCC Rcd at 12,472.

[182] *Id.*

[183] *Id.*

[184] *First Notice*, 11 FCC Rcd at 12,471.

[185] *PSWAC Final Report* at 45-7.

[186] *See Second Notice*, 12 FCC Rcd at 17,714 and 17,743.

[187] *Second Notice*, 12 FCC Rcd at 17,719-21.

[188] California Comments at 14; NPSTC Reply Comments at 3; APCO Comments at 14-16.

[189] We urge the National Coordinating Committee to use the *PSWAC Final Report's* proposed definitions when adopting guidelines for interoperability standards.

77. *Regional Planning Process*. In the *Second Notice*, the Commission tentatively concluded that the regional planning approach afforded the flexibility to accommodate the wide variety of communications requirements in different areas of the Nation, and for that reason proposed to use a regional planning approach for the 700 MHz band similar to that relied upon for the 800 MHz band.[190] Under the regional planning approach used for the 800 MHz band, the nation was divided into regions that would have as much autonomy as possible to develop plans that met their different communications needs.[191] The Commission felt that (1) establishing the separate regions would encourage uniformity and broader coordination in the public safety community in the particular geographical area; and (2) limiting the size of the regions would speed up the planning process and increase responsiveness to the unique local needs of the public safety community.[192] Of the 55 regions that were established, most were designed along state boundaries.[193] There were, however, states that were divided into different regions[194] and states in multi-state regions.[195] Each region formed a planning committee to develop a regional plan.[196] Membership was open to all eligible user groups.[197] APCO, as a certified frequency coordinator representing these eligible users, was directed to appoint a local convener who would organize and publicize the initial meeting.[198] After the plan was approved by the Commission, applications were normally submitted to the committee in accordance with the procedures contained in the plan, and then, if approved, the applicant would forward them to APCO for filing with the Commission.

78. Based on the record before us, we conclude that the regional planning approach is appropriate for assignment of licenses for that portion of the 700 MHz band designated in the band plan for general use. We agree with the majority of the commenters' assessment that the regional planning approach has, for the most part, succeeded in ensuring that the 6 megahertz of public safety spectrum in the 800 MHz band was assigned

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[190] *Second Notice*, 12 FCC Rcd at 17,757-58.

[191] *See National Plan Report and Order*, 3 FCC Rcd at 906.

[192] *See National Plan Report and Order*, 3 FCC Rcd at 910.

[193] *See* Appendix D for a list of the current regions for the 800 MHz band.

[194] The State of California includes all of Region 5 (California-South) and Region-6 (California-North). Similarly, the State of Texas includes all of Region 40 (Texas-Dallas), Region 49 (Texas-Austin), Region 50 (Texas-El Paso), Region 51 (Texas-Houston), Region 52 (Texas-Lubbock), and Region 53 (Texas-San Antonio).

[195] Portions of the following states were either in more than one region or in regions comprised of more than one state (Regional numbers are shown as follows (8)): Connecticut (8, 19), Delaware (28), Illinois (13, 54), Indiana (14, 54), Maine (19), Maryland (20), Massachusetts (19), Michigan (21, 54), New Hampshire (19), New Jersey (8, 28), New York (8, 30, 55), Pennsylvania (28, 36), Rhode Island (19), Vermont (19), Virginia (20, 42), Washington, D.C. (20), and Wisconsin (45, 54).

[196] *See National Plan Report and Order*, 3 FCC Rcd at 910-12.

[197] *National Plan Report and Order*, 3 FCC Rcd at 910.

[198] *National Plan Report and Order*, 3 FCC Rcd at 910. Furthermore, APCO was required to submit to the FCC a list of all the conveners within 45 days of the release date of the Report and Order. *Id*.

fairly and efficiently and put to its best, most appropriate, and most efficient use for public safety services.[199] Based on the Commission's experience with assignment of licenses for the 800 MHz band public safety spectrum, we believe that the regional planning approach maximizes spectrum efficiency and facilitates accommodation of a wide variety of localized public safety communications requirements in different areas of the Nation.[200] We also clarify that the 700 MHz band RPCs are organizations separate and distinct from the existing 800 MHz band RPCs because eligibility in the 700 MHz band is governed by Section 337 and there may be members of 800 MHz band RPCs that are not eligible to join the 700 MHz band RPCs. Additionally, we are providing several "opt out" elections to the 700 MHz band RPCs that cannot be extended to the 800 MHz band RPCs on the basis of the record developed in response to the *Second Notice*, which focused on the 700 MHz band.

79. The Joint Commenters oppose the regional planning approach, however, arguing that RPC efficiency has been hampered by politics, inadequate diversity of representation across the community of public safety entities, lack of funding for RPC activities, lack of coordination with adjacent RPCs (sometimes resulting in conflicting assignments in adjacent metropolitan areas), and inability to coordinate statewide channel assignments.[201] The Joint Commenters submit that because of these problems, the Commission should implement a different planning approach by giving the duties of RPCs to planning committees organized and maintained by the states.[202] They further assert that in many instances the implementation of a state planning approach would not require any changes to the boundaries of the existing regions and would resolve the inequities and imbalances experienced under the regional plans.[203] They submit that one of the primary advantages of giving these duties to the states would be that each state would be represented by its own planning committee in the development of a mutually agreeable resolution to inter-state issues.[204] In addition, the Joint Commenters propose that each state would be responsible for funding the activities of its own

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[199] *See e.g.*, IACP Reply Comments at 1-2, The City of Richardson, Texas Comments at 3; Motorola Comments at 4, 17; California Comments at para. 14; The City of Fort Lauderdale Reply Comments at 1; The County of Alameda Reply Comments at 1; NPSPAC Regional Review Committee, Region 49 (Region 49) at 2; NPSPAC Region 6 Regulatory Review Committee Reply Comments (Region 6) at 3; Brazos County Emergency Communications District Comments at 2; American Red Cross Comments at 2; The City of Long Beach, California Comments at 4-5; California Public-Safety Radio Association (CA/PSRA) Reply Comments at 2.

[200] *See Second Notice*, 12 FCC at 17,757.

[201] Joint Comments of American Association of State Highway and Transportation Officials (AASHTO), Forestry Conservation Communications Association (FCCA), International Association of Fire Chiefs, Inc. (IAFC), International Association of Fish and Wildlife Agencies (IAFWA), International Municipal Signal Association (IMSA), and National Association of State Foresters (NASF) (Joint Commenters) Reply Comments at 5.

[202] Joint Comments at 13.

[203] Joint Comments at 13.

[204] Joint Reply Comments at 5. For example, to determine frequency assignments near state boundaries and in major metropolitan areas encompassing more than one state, the implicated state committee simply would need to coordinate their activities, much as representatives of varying states have worked together on regional committees spanning cross-border areas and for mutual aid and other coordination purposes in multi-jurisdictional metropolitan areas.

planning committee.[205] We agree that these are valid concerns. Therefore, we offer the following recommendations to address these concerns.

80. Regarding inability to coordinate statewide channel assignments, given that most regions are defined along state boundaries we believe this experience is limited to multi-state regions. For example, Pennsylvania asserts that the current use of multi-state regions to address the needs of large metropolitan areas often hampers the ability of states to coordinate statewide systems, and that the regional boundaries should, at least, encompass an entire state.[206] The Joint Commenters argue that some states in multi-state RPCs have been hampered by regional politics and have been unable to obtain frequencies they vitally need.[207] In this connection, they cite to the inability of the southern New Hampshire Fire Department to secure channels because all available frequencies in Region 19[208] had been assigned in northern Massachusetts.[209] To alleviate this concern, we will allow RPC members from a state that either is included in multi-state regions or has portions of its geographic boundaries included in more than one region, to "opt out" of such regions to form a new RPC that would correlate to their state's geographic boundaries. To exercise this form of "opt out," all regional planning members/representatives that are from the state seeking to exercise its "opt out" right must reach a consensus decision and, if so, this would result in the formation of a new RPC for the 700 MHz band. The RPC for the new region would be required to adopt a plan based on the same criteria made applicable to the regions, as discussed *infra*. For those states having portions of their geographic boundaries included in more than one region, but not wishing to form a separate region, we will also provide the option for all RPC representatives from that state to join a single RPC instead of continuing to be divided among several RPCs. For example, Pennsylvania is part of Region 28 and Region 36. If all RPC members/representatives from Pennsylvania reach a consensus decision, they could elect to have Pennsylvania be a part of either Region 28 or Region 36, whichever it wishes.

81. *Regional Plan.* In the *Second Notice*, the Commission proposed to retain the existing RPCs for the 700 MHz band and incorporate the 700 MHz plans into the existing 800 MHz plans.[210] Although some support was expressed in the comments for this proposal, we believe that integration of the two plans would be difficult because of the alternative planning approaches adopted herein. Moreover, the technical and administrative rules are different so as to make a combined plan difficult to interpret and understand.[211] Therefore, we will require that there be two separate and distinct regional plans, one for the 800 MHz band and one for the 700 MHz band. The 700 MHz committee may be the same as the 800 MHz committee, or may be different, depending upon the boundaries and the administration selected.

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[205] Joint Reply Comments at 7.

[206] *See* Pennsylvania Comments at 11-12.

[207] Joint Comments at 13.

[208] Region 19 is composed of the states of Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, and a portion of Connecticut.

[209] Joint Comments at 13.

[210] *Second Notice*, 12 FCC Rcd 17,757-58.

[211] Region 20 Comments at 11. *See, also,* FLEWUG Reply Comments at 13 in support of Region 20's position.

82. The *National Plan Report and Order* required the 800 MHz regional plans to include, at a minimum, the following elements: (1) a cover page that clearly identified the document as the regional plan for the defined region; (2) the name of the regional planning chairperson, including mailing address and telephone number; (3) the names of the members of the regional planning committee, including organizational affiliations, mailing addresses, and telephone numbers; (4) a summary of the major elements of the plan; (5) a general description of how the spectrum would be allotted among the various eligible users within the region; (6) an explanation of how the requirements of all eligible entities within the region were considered and, to the degree possible, met; (7) an explanation as to how needs were assigned priorities in areas where not all eligible entities could receive licenses; (8) an explanation of how the plan had been coordinated with adjacent regions; (9) a detailed description of how the plan put the spectrum to the best possible use by requiring system design with minimum coverage areas, by assigning frequencies so that maximum frequency reuse and offset channel use may be made, by using trunking, and by requiring small entities with minimal requirements to join together in using a single system where possible; and (10) the signature of the regional planning chairperson.[212]

83. In the *Second Notice,* we proposed to adopt these requirements for the 700 MHz regional plans and invited comment on the adequacy of these common elements.[213] None were received. Comments were received, however, recommending the general need for improvement in the regional planning process. FLEWUG suggests that the 800 MHz RPCs have tended to be dominated by law enforcement agencies from large metropolitan jurisdictions.[214] Other commenters note that the active membership of some committees is not fully representative of all the types of public safety entities needed to ensure an effective and balanced process.[215] Therefore, while we are retaining some of the existing plan requirements and modifying others for the 700 MHz band, we will add some additional elements to the 700 MHz regional plan requirements in order to remedy some of the problems.

84. Under the revised elements, we expect all RPCs to ensure that their committees are representative of all public safety entities in their regions by providing: (1) adequate notice of all meetings; (2) opportunity for comment by all interested parties; and (3) reasonable consideration of the views expressed. We also expect the plans to list the steps undertaken to encourage and accommodate all eligible entities to participate in the planning process. Examples of material to include in the plan to meet this requirement are a description of steps taken to hold meetings in various parts of the region, copies of meeting notices and publications in which the notices were placed, and making all submission of materials available to each member. In addition, we believe that all RPC meetings should be open to all members of the public safety community. We believe that affording representatives of all entities in the public safety community the opportunity to participate in the planning process is essential.[216] The revised elements for the 700 MHz plans are:

- **#** Identification of the document as the regional plan for the defined region with the names, addresses, telephone numbers, and organizational affiliations of the chairpersons and all members of the RPC.

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[212] *National Plan Report and Order,* 3 FCC Rcd at 911.

[213] *Second Notice,* 12 FCC Rcd at 17,759-60.

[214] FLEWUG Comments at 12-13.

[215] *See, e.g.,* NPSTC Comments at 23-24; National League of Cities (NLC) Comments at 3-7; Joint Reply Comments at 3-4.

[216] *See* NPSTC Comments at 29-30.

- A summary of the major elements of the plan and an explanation of how all eligible entities[217] within the region were given notice, an opportunity to participate in the planning process and to comment and have those comments reasonably considered.

- A general description of how the spectrum would be allotted among the various eligible users within the region with an explanation of how the requirements of all eligible entities within the region were considered and, to the degree possible, met.

- An explanation as to how needs were assigned priorities in areas where not all eligible entities could receive licenses.

- Evidence that of how the plan had been *successfully* coordinated with adjacent regions.

- A description of how the plan encourages the efficient and effective use of the spectrum; employs system design flexible enough to accommodate improvements in technology, build systems with sufficient capacity to accommodate the full grange of functionalities needed to meet the communications needs of the public safety community of today and tomorrow.

- A description of the planning procedures, both present and future, including, but not limited to, amendment process, meeting announcements and minutes, data base maintenance, and dispute resolution.

- A certification that all RPC meetings, including subcommittee or executive committee meetings, were open to the public and the signature of the RPC chairperson.[218]

85. *Implementation of the Plan*. The states wishing to "opt out" of regions to form a new region defined by geographic boundaries should do so within 120 days of the effective date of this *First Report.*[219] For a state to "opt out" there must be a consensus to withdraw between all those representatives to the RPC from that particular state.

86. For the first RPC meeting, we request that the current regional chair or the state, if applicable, appoint a local convener who will be responsible for organizing and publicizing the meeting.[220] We request that the names, addresses, and telephone numbers of the conveners be provided to the Chief, Wireless Telecommunications Bureau within 120 days of the release date of this *First Report.* Parties interested in participating in the regional planning process should contact the appropriate convener. Officials responsible for National Security and Emergency Preparedness within the region should be notified of the initial planning meeting and invited to participate. At the first meeting, a Regional Chairman must be elected from among the membership. Once a Chairman has been elected, the name, address, and phone number of that individual should be sent to the Chief, Wireless Telecommunications Bureau. The RPC should promptly adopt operating

[217] All entities eligible to hold a license as described in Section IV-B, *supra.*

[218] *National Plan Report and Order*, 3 FCC Rcd at 911.

[219] The Wireless Telecommunications Bureau will release a Public Notice specifying the specific date by which states must indicate their decision to "opt out" of their current RPCs.

[220] The convener should set a date for the initial planning meeting, allowing at least 60 days for appropriate public notifications.

procedures to govern its operations. These procedures should ensure that all entities will be given reasonable notice of all committee meetings and deliberations, an opportunity to comment and be given reasonable consideration in the planning process. In developing their regional plans, the committees may take into account any and all guidelines developed by the National Coordinating Committee. Once the plan for a region has been finalized, an original and five copies of the plan should be forwarded by the RPC Chairman, to the Secretary, Federal Communications Commission, Washington, D.C. 20554.

87. *Review and Modifications of Regional Plans*. In establishing the framework of the National Plan, the Commission determined that its role in relation to the RPCs was limited to: (1) defining the regional boundaries; (2) requiring fair and open procedures; (3) specifying the elements that all regional plans were to include; (4) reviewing and accepting the plans, or rejecting them with an explanation; and (5) reviewing and accepting requests for modification of the plans, or rejecting them with an explanation.[221] Except as to matters requiring the exercise of Commission oversight,[222] we reaffirm those roles with regard to the 700 MHz band. We clarify that "fair and open procedures" require notice, opportunity for comment, and reasonable consideration.

88. For the 800 MHz band, the Commission staff are required to examine the proposed plan, or any modification thereof, to ensure that public safety needs are fully addressed, that the spectrum has been used efficiently, that coordination with adjacent regions has occurred, and that all requirements of the National Plan are met.[223] The *Second Notice* proposed retaining this same procedure for reviewing regional plans and modifications thereof in the 700 MHz band.[224] Region 49 argues that modification of plans should not require the express concurrence of adjacent regions because that gives the adjacent regions *de facto* veto power.[225] We continue to believe that inter-regional cooperation and concurrence remains the best, most cost effective, and least complicated method for avoiding cross-border harmful interference problems between regions. Thus, we reaffirm our conclusion that our current review procedure appropriately balances the requirements of fairness and efficiency, and we will require that all 700 MHz plans, and any future modifications, continue to be reviewed and approved using this procedure with one exception. The requirement to coordinate with adjacent regions is clarified to require that letters of concurrence with the proposed modification, signed by the chairperson of each adjacent region, be submitted to the Commission with a region's modification request. At present, APCO, acting in its frequency coordination role, or the regional planning chairperson may recommend, in writing, changes to a regional plan.[226] We decline to continue this process. Instead, we modify our present practice to require that the RPC chairperson, as elected by the membership, initiate, in writing, any plan modification.

89. If a region does not choose to administer its plan, the certified frequency coordinators would be permitted to continue to process applications consistent with the existing plan. If the RPC disbands prior to the adoption of a 700 MHz plan, and its members did not choose to establish separate plans pursuant to the

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[221] *National Plan Report and Order,* 3 FCC Rcd at 910-11.

[222] *See* para. 94, *infra*.

[223] *National Plan Report and Order,* 3 FCC Rcd at 911.

[224] *Second Notice*, 12 FCC Rcd at 17,760-61.

[225] Region 49 Comments at 3.

[226] *National Plan Report and Order*, 3 FCC Rcd at 911.

options discussed in paragraphs 85 and 86, *supra*, the five certified frequency coordinators could come to consensus and adopt a *joint* default plan, approved by the Commission, and process applications based on that plan. The frequency coordinators' authority to use the plan would be terminated by the filing of an applicable regional plan for the region or any of its members. Any amendments or modifications to the default plan would require prior Commission approval.

3. National Planning

90. In the *Second Notice*, we stated that our primary goal with respect to interoperability should be seamless interoperability on a nationwide basis.[227] To accomplish this goal, we asked whether a national planning committee was needed to develop recommendations on policies for the portion of the spectrum devoted to interoperability.[228] The comments filed herein strongly support the need for national planning not only for the interoperability portion of the new spectrum, but for general use spectrum also.[229]

91. Based on the record before us, we conclude that a national committee would provide valuable assistance to both the Commission and the public safety community as a mechanism to ensure the most efficient use of the new spectrum. We believe that the public safety community, and many of the regional disputes, could be assisted or resolved by national guidelines. We note that some commenters suggest that the scope of responsibility for a national planning committee include: (1) determining the structure and administrative responsibilities of regional planning committees; (2) adopting generic channel plans; (3) ensuring efficient channel usage; (4) providing a workable and enforceable plan for return of channels replaced by new spectrum; (5) coordinating inter-regional planning; (6) serving as an appellate board for review of regional committee decisions or disputes between regions; and (7) providing a common database platform to maintain the operational specifics of each licensee.[230] The Joint Commenters recommend the adoption of a national plan that includes: (1) eligibility guidelines; (2) application submission and processing procedures; (3) methods for enforcing construction requirements; (4) a channel "giveback" program; (5) procedures for resolving inter-regional disputes; (6) the provision of oversight and advice for local planning; and, (7) an express reservation of final authority to the Commission.[231]

92. While we are persuaded that a national committee is warranted, we are not convinced that a national committee with oversight responsibilities is in the public interest. We believe that such responsibilities should reside with the Commission. Instead, we find that a national committee should assist and augment the regional planning process. Our most effective activities with the public safety community have been within the formal structure of the National Public Safety Advisory Committee (NPSPAC) and the PSWAC. Consequently, we will charter through the procedures provided in the FACA the Public Safety National Coordination Committee (National Coordination Committee or NCC) as a federal advisory committee for the purpose of addressing and advising the Commission on policy relating to matters discussed below. By using FACA procedures, we intend to provide formality to the NCC and to ensure participation by representatives

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[227] *See Second Notice*, 12 FCC Rcd at 17,714 and 17,743.

[228] *See Second Notice*, 12 FCC Rcd at 17,742-44.

[229] *See, e.g.*, FLEWUG Comments at 13; Brazos Comments at 2; Region 49 Comments at 2; APCO Comments at 3; CA/PSRA Comments at 2 .

[230] *See* APCO Comments at 2-3; NPSTC Comments at 23-24; FLEWUG Comments at 18.

[231] *See* Joint Comments at 9.

of all elements of the public safety community.[232] The National Coordination Committee is intended to operate over a period of four years,[233] and its major responsibilities will be to: (1) formulate and submit for Commission review and approval an operational plan to achieve national interoperability that includes a shared or priority system among users of the interoperability spectrum for both day-to-day and emergency operations and, in this connection, recommendations regarding Federal users' access to the interoperability spectrum; (2) recommend interoperability digital modulation, trunking, and receiver standards for Commission review and approval; (3) offer voluntary assistance in the development of coordinated regional plans; and (4) provide recommendations on other technical matters that are common to the public safety community generally. The NCC's charter will also specify that it or a working group established thereunder is to be accredited by the American National Standards Institute (ANSI) to develop all technical standards. Because the NCC will be required to become American National Standards Institute-certified, the Commission will not unnecessarily disturb technical standards recommended through this open and neutral process.[234] Further, because realization of interoperability is of critical importance to the public safety community, the charter will include milestones for timely accomplishment of certain tasks to ensure that the NCC's work is completed in the most expeditious manner practicable.

93. FLEWUG recommends the formation of both a national general use coordination body and a national interoperability coordination committee because it asserts that the planning and management processes for the general use channels and the interoperability channels are similar but not identical.[235] In addition, FLEWUG suggests that these two bodies establish a standing working group to meet regularly to ensure adequate coordination and integration.[236] We find that one national committee would be more effective and efficient than two. Although there may be some differences between the process required to develop a national interoperability plan and the processes involved in developing policies for general service spectrum, we find that such differences are not so great as to justify the duplication of effort, personnel, and expense necessarily involved in creating two national committees. A single committee could address both issues, would better conserve scarce public safety financial resources and more efficiently focus the talent and expertise of the public safety communications community, which is often represented by a small group of dedicated individuals in each region. We are convinced that if we were to form two committees, many of the same individuals would end up serving on both. We conclude, therefore, that the establishment of a single national committee provides the best approach without duplication.

94. Some commenters favoring a national committee stress the need for representation on the committee to include all levels of the public safety community, the Commission, and individuals with technical

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[232] 5 U.S.C., App.

[233] Advisory committees chartered under FACA can have terms of two years or less but charters can be renewed. *See* 5 U.S.C., App. 2 (1988).

[234] ANSI is a private, nonprofit membership organization supported by a diverse constituency of private and public sector organizations. *See, e.g.,* An Introduction to ANSI (<http://web.ansi.org/public/about.html>). ANSI does not itself develop American National Standards (ANSs); rather, it facilitates their development by establishing guidelines to ensure consensus, due process, and openness. *Id.* ANSI has three methods of accreditation (organization, committee or canvass). *See generally* ANSI Procedures for the Development and Coordination of American National Standards (approved by the ANSI Board of Directors, April 1998).

[235] FLEWUG Comments at 18.

[236] FLEWUG Comments at 19.

expertise and proven leadership in the regional planning process.[237] Others indicated that the committee would be most knowledgeable, most representative, and most likely to be effective if it were made up of representatives from the public safety user community across the country, rather than public safety organizations.[238] Based on our experience gained from both NPSPAC and PSWAC, we conclude that a national coordination committee composed of a broad range of representatives of the public safety user community is appropriate.[239]

4. Frequency Coordination

95. *Coordinators.* Frequency coordination is the process by which a private organization recommends to the Commission the most appropriate frequencies for private land mobile radio (PLMR) service applicants.[240] Frequency coordinators provide a valuable service to the Commission by eliminating common application errors, thereby improving the quality of the applications, resolving potential interference problems at the source.[241] There are currently four frequency coordinators certified to coordinate frequencies for public safety applicants.[242] Until 1997, each public safety frequency coordinator was authorized to coordinate frequencies only in certain identified groups of frequencies, called "Services."[243] In the *Refarming Second Report and Order*, the Commission established a structure whereby each of the existing certified public safety frequency coordinators continued to manage the frequencies for which they were responsible prior to consolidation.[244] The one exception to this scheme was the Local Government Radio Service, which the Commission opened to all of the certified public safety coordinators.[245] The Commission adopted this

[237] *See e.g.*, FLEWUG Comments at 18; APCO Reply Comments at 4.

[238] We note that NPSTC is a voluntary association of organizations including the four certified public safety frequency coordinators, and, as such, its membership would be represented on the Coordinating Committee.

[239] The specific makeup and responsibilities of the National Coordination Committee will be announced in a separate Public Notice.

[240] *See* Frequency Coordination in the Private Land Mobile Radio Services, PR Docket No. 83-737, *Report and Order*, 103 FCC 2d 1093 (1986) (*Frequency Coordination Report and Order).*

[241] We note that in the future frequency coordinators will provide an even greater service by filing applications electronically.

[242] The coordinators are: Association of Public-Safety Communications Officials-International (APCO); International Association of Fire Chiefs, Inc. (IAFC)/International Municipal Signal Association (IMSA); Forestry Conservation Communications Association (FCCA); and American Association of State Highway and Transportation Officials (AASHTO).

[243] *See Frequency Coordination*, *Report and Order*, 103 FCC 2d 1093 (1986).

[244] 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 Assignment Policies of the Private Land Mobile Radio Services, PR Docket No. 92-235, *Second Report and Order*, 12 FCC Rcd 14,307 (1997) (*Refarming Second Report and Order).*

[245] *See Refarming Second Report and Order*, 12 FCC Rcd at 14,327.

exception, in part, because frequencies in the Local Government Radio Service were routinely used by all Public Safety Radio Services.[246]

96. In the *Second Notice*, we did not directly address the issue of frequency coordination. Nonetheless, several commenters address the question in connection with the new spectrum. APCO, for example, requests designation as the sole coordinator for the new spectrum,[247] and several commenters filed in support.[248] In justification of its request, APCO suggests that, as the sole coordinator for the 800 MHz public safety spectrum, it is the only coordinator with experience in working with regional planning and in coordinating spectrum for wide-area, multi-agency systems in that band.[249] Furthermore, it claims that it is the only coordinator with a network of local frequency advisors in each of the public safety planning regions.[250] If APCO is selected as the sole coordinator for the 700 MHz band, it offers to provide reasonable direct technical, organizational, and financial support for regional planning activities and to maintain a separate and unique regional planning database available to all regions over the Internet.[251]

97. AASHTO urges the Commission to allow all of the certified coordinators to provide coordination services in the 700 MHz band and asserts that it has had a system of frequency coordinators in all fifty states, the District of Columbia, and Puerto Rico, for over 40 years.[252] Moreover, AASHTO argues that at least one state experienced substantial delay in its efforts to expand its "shared resource" statewide telecommunications system because of APCO's failure to process the applications. This delay would not have occurred, AASHTO asserts, if there had been multiple coordinators.[253] The Joint Commenters oppose APCO's designation as sole coordinator and urge the Commission to allow any of the certified frequency coordinators to provide frequency coordination services.[254] Ericsson recommends that frequency coordination be open to all organizations engaged in the process of coordination, and asserts that competition will result in lower overall costs for public safety licensees.[255]

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[246] *See Refarming Second Report and Order*, 12 FCC Rcd at 14,327.

[247] APCO Comments at 7.

[248] *See, e.g.,* Alameda County Reply Comments at 2; CA/PSRA Reply Comments at 2; Powell Reply Comments at paras. 27-32.

[249] APCO Comments at 8.

[250] APCO Comments at 8.

[251] APCO Comments at 7-8.

[252] AASHTO Reply Comments at 6-7.

[253] AASHTO Reply Comments at 6-7.

[254] Joint Reply Comments at 8-10.

[255] Ericsson Reply Comments at 5.

98. We will adopt for the general use portion of this band the same frequency coordination processes adopted for the Local Government Radio Service in the *Reframing Second Report and Order*.[256] Therein, we reasoned that since the frequencies in the Local Government Radio Service were available to all public safety entities (just like they are for the new spectrum) any of the certified public safety coordinators may provide coordination.[257] While we acknowledge the generous offers of assistance to RPCs by APCO, we nevertheless decline to choose it to be the sole coordinator for the public safety frequencies in the 700 MHz band. We continue to believe that by encouraging competition among coordinators, we will promote cost-based pricing of coordination services and provide incentives for enhancing service quality.[258] Therefore, we will allow any of the certified public safety coordinators to provide coordination in the 700 MHz band.

99. *Data Base*. In order to make the best possible frequency recommendations, coordinators must have complete and accurate knowledge of the radio environment in which a proposed system is designed to operate. Several commenters argue that a common data base for the new spectrum is essential.[259] Some suggest that it be maintained by the National Coordinating Committee.[260] Others suggest that the Commission maintain the database, and Ft. Lauderdale recommends that APCO maintain the data base.[261] As mentioned above, APCO indicated that it would make its database available to all regions if it were the sole coordinator.[262] AASHTO asserts that, through its data base contractor, it has achieved near "real time data transfer which eliminates the need for a "single data base" as proposed by APCO.[263] Moreover, AASHTO asserts that such a data transfer methodology would be accomplished easily for the 700 MHz band.[264]

100. We believe that, if it were attainable, a common coordinator data base would be the best method for providing all coordinators with accurate up-to-date information needed to formulate accurate frequency recommendations.[265] However, since there is no evidence in the record indicating that a consolidated database created by the frequency coordinators is a viable option, we conclude that the notice and waiting-period provisions adopted in the *Reframing Second Report and Order* are the most practical methods by which accurate frequency coordination decisions can be made.[266] Specifically, all frequency coordinators must

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[256] *See Reframing Second Report and Order,* 12 FCC Rcd at 14,327.

[257] *See Reframing Second Report and Order,* 12 FCC Rcd at 14,327.

[258] *Reframing Second Report and Order,* 12 FCC Rcd at 14,327.

[259] *See* NPSTC Comments at 23-24; FLEWUG Reply Comments at para. 49; NLC Comments at 6; Joint Comments at 19.

[260] *See* NPSTC Comments at 23-24.

[261] *See* Ft. Lauderdale Reply Comments at 2.

[262] APCO Comments at 7-8.

[263] AASHTO Reply Comments at 5.

[264] AASHTO Reply Comments at 5.

[265] *See Reframing Second Report and Order*, 12 FCC Rcd at 14,332.

[266] *See Reframing Second Report and Order,* 12 FCC Rcd at 14,333-335.

provide notice of all frequency recommendations made to the Commission to all the other frequency coordinators, with one-business day of making such recommendation. In addition, all applicants for new or modified facilities are required to observe a ten-day waiting period before commencing operation in order to avoid the possibility of interference with existing facilities. Finally, we reject APCO's suggestion that its database should serve as the official coordination tool for the 700 MHz band because it is predicated on our designation of APCO as the sole coordinator, which we have declined to do.[267]

5. Construction Requirements

101. As noted in the *Second Notice*, Part 90 of the Commission's Rules generally requires a licensee in the 800 MHz band to construct a station and place it in operation within eight months for conventional systems and twelve months for trunked systems.[268] In certain instances, the construction period can be longer, even up to five years upon appropriate justification.[269] In the *Second Notice* we sought comment on the appropriate construction requirements for public safety stations licensed in the 700 MHz band.[270]

102. The responses to our request vary in their approach, yet all of the commenters recommend that the construction period be longer than the standard eight to twelve months for Part 90 public safety licensees.[271] NPSTC recommends a two or three year deadline with the possibility of extending the construction period up to five years if good cause is demonstrated.[272] Florida suggests a three year construction period with routine extensions allowed to five or even ten years.[273] Other commenters advocate a five year construction period.[274] New York State Police recommend that large scale, statewide systems be allowed a ten year construction period.[275]

103. We conclude that a twelve month construction deadline should apply to public safety applicants in the 700 MHz band. Nonetheless, because state and local governments often follow multi-year cycles for the planning, approval, funding and purchasing of their public safety systems, we will also follow Section 90.155(b), which permits local government entities a longer period for placing a station in operation where the applicant submits a specific schedule for the completion of each portion of the entire system, along with a

[267] *See* para. 100 *supra*.

[268] *See Second Notice*, 12 FCC Rcd at 17,777, referring to 47 C.F.R. § 90.155 (a) and § 90.631(e).

[269] *Second Notice*, 12 FCC Rcd at 17,777.

[270] *Second Notice*, 12 FCC Rcd at 17,777-78.

[271] *See, e.g.*, NPSTC Comments at 46; Florida Comments at 8; Long Beach, CA Comments at 6; California Comments at para. 47; NYS Police Comments at 8.

[272] NPSTC Comments at 46.

[273] Florida Comments at 8.

[274] *See, e.g.*, Long Beach, CA Comments at 6; California Comments at para. 47.

[275] NYS Police Comments at 8.

showing that the system has been approved and funded for implementation in accordance with that schedule.[276] None of the commenters have made a convincing argument that the Commission's current rules, which allow public safety entities to request an extended implementation schedule of up to five years, would not be adequate.[277] Thus, an applicant will have twelve months to place a system in operation or up to five years if application is made pursuant to Section 90.155(b). We continue to believe that allowing public safety applicants up to five years allows sufficient time to complete the planning, approval, funding, and construction needed to place a proposed system in operation.

D. TECHNICAL REQUIREMENTS

1. Overview of Technical Requirements

104. In this section, we consider technical requirements for systems and equipment to be used in the 700 MHz band. In particular, we discuss technical specifications that determine the spectrum use efficiency, interoperability, and interference potential of public safety systems. We believe that only a minimal set of Commission technical regulations is necessary to enable nationwide interoperability, to facilitate spectrum management, to encourage efficient and effective spectrum use, and to promote competition and avoid undue delays in equipment development.

105. As previously noted, one of our principal goals in this proceeding is to provide a significant amount of spectrum for public safety interoperability. Having reserved approximately 10 percent of the 24 megahertz in the 700 MHz band for interoperability channels, we must now, as we proposed in the *Second Notice*, adopt technical standards sufficient to ensure that these channels will be usable for interoperability purposes anywhere in the country. Accordingly, we must consider more extensive technical requirements for equipment and systems using the nationwide interoperability channels than for equipment and systems operating in statewide, regional and local channels. Although we are setting a few of the basic technical standards in this *First Report*, many of the specifications for advanced innovative technology that will be needed to ensure successful nationwide interoperability in this band have only begun to be developed by the equipment manufacturers and public safety committees. Our preference is for these standards, which will apply to use of the nationwide interoperability channels, to be developed by an ANSI-accredited industry body and recommended by the National Coordination Committee for our consideration, within a set time frame.

106. We are also mindful that the basic technical framework we adopt today will affect the equipment design of future public safety systems. Therefore, we recognize that, consistent with our often-repeated regulatory goals, these regulations must provide the minimum necessary constraints that meet reasonable goals for interoperability, spectrum use efficiency and interference protection. In addition, we believe that the rules we adopt must be as competitively and technologically-neutral as possible to allow for competing equipment designs and to avoid hindering or precluding future innovative technological developments. We note that tighter technical specifications generally allow more intense spectrum use, but may result in higher equipment costs. Conversely, while wider tolerances may allow manufacturers to use less costly component parts in transmitting equipment, they may also result in less efficient spectrum use. With these considerations in mind, we believe the technical regulations we adopt herein provide a reasonable balance of these concerns.

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[276] *See* 47 C.F.R. § 90.155(b). APCO has filed a Petition for Rule Making, seeking, *inter alia*, to amend Section 90.155(b) so that an applicant, would be required merely to demonstrate that it has sought funding. *See* Public Notice, "Petitions for Rulemaking Filed," Report No. 2251 (rel. Jan. 28, 1998).

[277] *See* 47 C.F.R. § 90.155(b).

2. Technical Requirements for the Nationwide Interoperability Channels

107. *Modulation Type*. We will first discuss the issue of whether we should allow or require the use of analog modulation or digital modulation (or both) for interoperable 700 MHz band public safety systems.[278] In the *Second Notice*, we tentatively concluded that in order to provide for nationwide interoperability, we must, at a minimum, specify whether analog or digital modulation is to be used on the interoperability channels.[279]

108. Although most of the commenters generally support the use of digital modulation on the interoperability channels, many also favor specifying an analog modulation type as a baseline. Several of the commenters suggest that we specify analog FM voice modulation on the interoperability channels, either as an interim standard to be used until a digital standard is established and equipment for that standard is developed, or indefinitely as a baseline interoperability mode.[280] We have considered this suggestion, but reject it for the following reasons. First, if we allow the construction of analog-only systems in this band, this could once again create a situation where a public safety band becomes encumbered with a significant financial investment in an obsolete technology. Second, the availability of less expensive analog-only equipment could diminish the market for digital equipment, resulting in delays and higher costs for those users who do wish to buy digital equipment in order to obtain its benefits. Third, establishment of analog-only systems would diminish the availability of spectrum for digital modulated equipment. Fourth, digital technology is better suited to accommodate emerging technologies and advanced capabilities for the equipment operating in this band.

109. We believe that digital modulation technology is a very important factor in optimizing efficiency of spectrum use, and as such, it will be a key technology for the future of land mobile radio. Because land mobile radio equipment (analog or digital) designed to operate in the 700 MHz band is not yet available, we are presented with a unique opportunity to ensure that spectrally efficient modulation technology is incorporated in public safety equipment for this band from the outset.

110. We are concerned with the amount of time that standards development processes require, and in the *Second Notice* we asked whether the possible delay in setting a digital modulation standard for interoperability might outweigh the advantages of digital modulation. This assumes that analog equipment could be more quickly developed. We now conclude that, in view of the progress that is being made in the development of digital public safety equipment, *e.g.*, as cited by Pennsylvania,[281] that an interoperability standard is possible within a reasonable time frame, and that the long term advantages of digital modulation will be worth the small delay. For these reasons, we will require that 700 MHz band public safety equipment, when operating on the interoperability channels, be designed to use digital modulation as its primary modulation mode. We will allow mobile and portable units to have analog modulation capability, but only as a secondary mode in addition to its primary digital mode.

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[278] In the *Second Notice*, we entitled sections primarily addressing the question of analog versus digital modulation "Transmission Technology". *See Second Notice*, 12 FCC Rcd 17,732-35 and 17,772-73.

[279] *See Second Notice*, 12 FCC Rcd 17,732.

[280] *See e.g.* NPSTC Comments at 3, 38; Ericsson Comments of Ericsson at 7-8; The City of Richardson, Texas Comments at 5; Joint Reply Comments at 13.

[281] Pennsylvania Comments at 7-8.

111. *Standards for Digital Modulation.* Our adoption of a requirement for digital modulation on the interoperability channels in the 700 MHz band raises the question of which digital modulation standards to utilize. Clearly, if interoperability is to be achieved on these channels, a single standard must be selected to ensure equipment compatibility. In the *Second Notice*, we sought comment as to whether or not the Commission should adopt a digital modulation standard, and if so, we questioned whether that would "lock in" the technology of today at the expense of precluding emerging technologies.[282] We posed questions concerning the process involved in developing a standard, in particular, how long it would take for industry bodies to develop standards.[283] We also observed that common encryption standards may be desirable for public safety communications on the interoperability channels, and so we invited comment as to the scope of any such additional standards that may be needed to ensure effective interoperability, including how such standards should be developed and the elements these standards should encompass.[284]

112. As previously noted, many of the commenters favor adoption of a single digital standard (many support the Project 25 family of standards in particular) along with an analog standard (particularly 12.5 kHz FM voice) for interim or baseline use.[285] Some commenters urge adoption of a digital standard by a date certain[286] and most support analog FM as the common mode for voice communications in the interim.[287] Some commenters believe that the Commission should set all interoperability technical standards on the national level.[288] Several commenters state that any standard-setting must be achieved through an open and fair process as under an ANSI-accredited entity, with no proprietary data incorporated into the standard.[289] In response to the questions on encryption, some commenters urge us to adopt an encryption standard for interoperability channels.[290]

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[282] *See Second Notice*, 12 FCC Rcd 17,732-17,735.

[283] *Id.*

[284] *Second Notice*, 12 FCC Rcd 17,754.

[285] *See e.g.*, Joint Comment at 13-14, NPSTC Comments at 28 and 41.

[286] *See* FLEWUG Comments at 10 (agrees with *PSWAC Final Report* that digital standards should be developed within 2 years though an open and fair process), *id.*, at para. 16; *See also*, FLEWUG Reply Comments at para. 17; and Region 49 Comments at 2.

[287] Joint Reply Comments at 13-14 (Supports adoption of analog FM as the baseline technology for interoperability channels. Notes that most public safety equipment uses analog FM.); Region 49 Comments at 2 (adopt PSWAC recommendation that analog modulation for voice should be the minimum common mode).

[288] NPSTC Comments at 25.

[289] FLEWUG Comments at 17 (notes that the standards development option that has the greatest likelihood of success is an open standard, created by an American National Standards Institute (ANSI) accredited entity); California Comments at para. 15 (lack of standards defining how trunking and encryption should function, lead to non-competition); Northern Telecom, Inc. (Nortel) Reply Comments at IV.

[290] California Comments at para. 15; (lack of standards defining how trunking and encryption should function lead to non-competition. Standards may discourage innovation and development of new technology, but public safety needs reliable platforms which have a reasonable life-cycle); Project 25 Comments at 13 (Project 25 has adopted a Common-Air-Interface and many related standards, such as trunking, encryption and the other features

113. Although it is clear that digital modulation standards must be adopted for the narrowband and wideband interoperability channels, we find that it would be premature to do so at this time. In regard to the interoperability wideband (image/HSD and video) channels, industry standard setting activities such as Project 34 are presently in early stages; consequently we do not have information on the record to adopt a digital standard for these applications. We decline to adopt the Project 25 Phase I standards for the 700 MHz band because we intend that this band ultimately be used with a spectrum efficient 6.25 kHz technology (Project 25 Phase I is a 12.5 kHz standard).[291] We note that the Project 25 body has begun a promising Phase II process looking toward a digital standard for 6.25 kHz channels, and it appears that this process will also consider possible alternative technologies that provide equivalent spectrum efficiency with wider emissions. We will require that the National Coordination Committee or a working group established thereunder seek and obtain recognition as an ANSI-accredited entity. We further will require the National Coordination Committee to monitor industry standard-setting activities, including those described above, and use the information learned to recommend a set of voluntary technical standards for digital modulation to be used on the nationwide interoperability channels. While we are now placing this task in the purview of the National Coordination Committee, we nonetheless will monitor its progress regarding its standard-setting activities. Because the NCC will be required to become American National Standards Institute-certified, the Commission will not unnecessarily disturb technical standards recommended through this open and neutral process.

114. *Trunking.* In the *Second Notice*, we tentatively concluded that a trunked system is the best and possibly the only practicable method to achieve, in a large scale emergency, the rapid coordination of communications among many personnel from different agencies and regions.[292] We sought comment on the advantages and disadvantages of using trunking technology on interoperability channels, on our proposal to require trunking on the interoperability channels, and as to how a single trunking technology standard, appearing to be necessary to maintain nationwide interoperability, could be selected in a timely manner.[293] We asked whether the Commission should adopt a trunking standard for communications on the interoperability channels or whether we should leave to the RPCs the decisions about whether to employ trunking and of what trunking standards to select.[294]

115. Many of the commenters addressing these questions vigorously oppose the adoption of a Commission requirement to use trunking technology on the interoperability channels. These commenters offer several reasons why they believe that trunking technology does not meet operational requirements for interoperable communications. First and foremost, the commenters argue that relying solely upon trunking technology for interoperability communications would require a costly and complex infrastructure to be in place simply to provide communications between nearby units responding at the scene of an incident. Because the location where an emergency might occur cannot always be predicted, the commenters note that it could not be guaranteed that system coverage would be adequate at any particular location. Generally, in situations

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necessary for interoperability); NPSTC Comments at 29 (noting that Project 25 includes digital encryption as an integral part of the standards suite). Over-The-Air Rekeying (OTAR) is a standardized option.

[291] We have, however, arranged the band plan such that pairs of 6.25 kHz channels are adjacent and can be combined and used as 12.5 kHz channels until such time as standard 6.25 kHz equipment is readily available.

[292] *Second Notice*, 12 FCC Rcd at 17,752.

[293] *Second Notice*, 12 FCC Rcd at 17753.

[294] *Second Notice*, 12 FCC Rcd at 17752.

where emergency and disaster response interoperability communications are required, direct unit to unit communications at the site is what is most needed, rather than the wide area capabilities of a trunked system.[295] NPSTC also observes that mandating trunking technology on the nationwide interoperability channels would necessitate creation and maintenance of a nationwide database of radio unit ID numbers.[296] According to California, experience indicates that trunked systems may actually be less efficient in situations where there is a very large volume of message traffic. This occurs because on a trunked system the users are not generally aware of system loading or the nature or urgency of other communications on the system to which they are not a party. Thus, not all of the system users are aware when there is an emergency in progress, and consequently they continue to engage in lower priority communications that load the system, and which they might choose to refrain from transmitting if they knew that the system was being used for an emergency situation.[297] Various commenters cite the increased cost of trunked equipment as a disincentive for smaller agencies to support interoperability. Some commenters do favor being allowed (although not required) to use trunking technology in the interoperability spectrum in some form,[298] and at least one county has developed its own regional, 22 channel trunked system which it says has enhanced its ability to communicate across the communication lines of different public safety agencies.[299] On the other hand, Florida urges us not only not to mandate trunking, but to prohibit it on the interoperability channels.[300]

116. After consideration of these views, we realize that our tentative conclusion that trunking is the only practicable technology for interoperability may have been overstated. We still believe that for most routine day-to-day interoperability communication needs, trunking technology provides the benefits of spectrum efficiency (*i.e.* fewer instances of waiting for a channel to be clear, compared to a conventional system), and the advantages of being able to organize users into talk groups and to establish communications priority. The commenters have convinced us, however, that conventional, repeated or direct unit-to-unit communications can be better suited for some types of interoperability communications needs. Therefore, we are not adopting a requirement mandating trunking on the interoperability channels at this time. We will, however, strongly recommend to the National Coordination Committee that it immediately consider the benefits of employing trunking on (at least) a portion of the nationwide interoperability spectrum,[301] and we will direct it to make a timely recommendation to us as to whether Commission action to require trunking on nationwide interoperability spectrum is needed.[302]

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[295] FLEWUG Comments at 16; Florida Comments at 4-5; and NPSTC Comments at 26-27.

[296] NPSTC Comments at 27.

[297] California Comments at paragraph 29.

[298] Region 49-Austin, Texas (Region 49) Comments at 2; APCO Project 25 Steering Committee (Project 25) Comments at 12.

[299] The County of Alameda (Alameda) Reply Comments at 1.

[300] *See* Florida Comments at 4.

[301] We note that 20 of the 32 nationwide interoperability channels in each TV channel, which NPSTC had indicated would serve well for paired interoperability systems, could be used for trunked systems.

[302] An early recommendation on this matter is appropriate because, in the event trunking will be used, the work on standard setting must commence as soon as possible.

117. We recognize that employing trunked systems for interoperability communications in a public safety equipment market where multiple incompatible trunking technologies are available ultimately requires choosing one technology over another, something the Commission is not generally inclined to do.[303] As with the standards for digital modulation, we prefer instead that a compatible trunking standard be developed by an ANSI-accredited standard setting body. We have noted that disagreements over intellectual property rights and technical issues attendant to the adoption of a digital trunking standard were experienced through the Project 25 process.[304] In the event that a trunking standard for nationwide interoperability use is required, we hope that, in the interest of enhancement of public safety services throughout the country, a repetition of these problems can be avoided. If the National Coordination Committee recommends that trunking be required, we will require that it fulfill the same requirements regarding recommendation of an interoperability trunking standard as established for the recommendation of the interoperability digital modulation standard.

118. *Receiver Standards*. Recently, the Commission has adopted rules only as necessary to limit interference between communications systems, and has not specified performance or quality standards for receivers. Instead, we have typically relied on market forces to determine the appropriate balance between quality of receivers used by licensees and their cost. In the *Second Notice*, we solicited comment on applying this same methodology in the 700 MHz band.[305]

119. Several public safety agencies filed comments in support of mandated receiver standards for general use, as well as for interoperability channels,[306] while the three manufacturers that submitted comments all opposed receiver standards generally.[307] Proponents noted that minimum performance specifications, such as adjacent channel selectivity, spurious and intermodulation rejection, and receiver stability, are necessary components of any interference analysis. NTIA, long a proponent of receiver performance standards, states that receiver standards are necessary for the effective and efficient management of the spectrum.[308] NPSTC states that receiver standards have been essential to obtaining maximum spectrum efficiency in the 821 MHz band.[309] Kenwood, however, argues that equipment manufacturers already have incentives to provide optimum receiver performance and public safety licensees will continue to specify their minimum acceptable technical specifications through the traditional bid and contract process.[310]

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[303] Budget Act. *See also, National Plan Report and Order,* 3 FCC Rcd at 909.

[304] *Second Notice*, 12 FCC Rcd at 17,753.

[305] *Second Notice*, 12 FCC Rcd at 17,739-41 and 17,773-74.

[306] *See, e.g.*, NPSTC Comments at 19; FLEWUG Comments at 11; Florida Comments at 2 and 7.

[307] Ericsson Comments at 9; Motorola Reply Comments at 5; Kenwood Communications, Inc. (Kenwood) Reply Comments at 3-4.

[308] NTIA Comments at 12.

[309] NPSTC Comments at 19.

[310] Kenwood Reply Comments at 3-4.

120. Most commenters also believe that receiver standards should be set because comparatively smaller public safety agencies may not have the in-house capability of measuring receiver performance.[311] Florida and others strongly recommend that receiver standards be adopted either for general use as well as interoperability channels.[312] We note that present equipment manufacturers generally do not favor mandated radio receiver standards.[313] FLEWUG also believes that receiver performance standards should be mandatory by a date certain.[314]

121. After considering these comments regarding receiver standards, there appear to be two issues before us at this time. The first is whether the Commission should establish a certain minimum quality for public safety receivers, particularly for interoperability purposes. The comments did not support a distinction between general use and interoperability operations. Although we continue to hold the general view that receiver standards should not be mandated by the Commission for quality purposes, we are concerned that interoperability communications may typically be of greater urgency than ordinary day-to-day public safety communications, and to the extent that receiver standards may improve the reliability of interoperability communications systems used in such critical safety of life and property circumstances, we believe that receiver standards may be appropriate. Accordingly, we will require that the NCC fulfill the same requirements regarding recommendation of receiver standards for the nationwide interoperability channels as established for the recommendation of the interoperability digital modulation standard. We charge the NCC with recommending the scope of parameters (*e.g.* sensitivity, selectivity, dynamic range, durability characteristics) that need to be included in the receiver standards.

122. *Standards Development Process* We conclude that technical standards for all interoperability channels in the 700 MHz band should be chosen and recommended in accordance with the following process, reporting requirements and time frame:

- recommend digital technical and equipment standards for integrated voice and data, image/HSD and video communications no later than four years from the release date of this *First Report;*
- no proprietary data is to be incorporated in any standard ultimately recommended unless the proprietary data is made available on a fair, reasonable, unbiased and non-discriminatory basis, with license fees approved by ANSI and on terms and conditions set by that standards body;
- only an open process, governed by ANSI or standards approved by ANSI, is to be utilized in recommending these standards;

[311] Florida Comments at 7 (argues that the vast majority of public safety agencies do not have the experience or knowledge to determine whether receiver performance satisfies their needs and strongly encourages the Commission to adopt receiver standards for all radios in the 746-806 MHz band).

[312] Florida Comments at 2; NTIA Comments at 12; FLEWUG Reply Comments at para. 20 (agrees with NTIA that standards be consistent with NTIA and TIA standards); Powell Reply Comments at para. 36.

[313] *See e.g.*, Ericsson Comments at 19.

[314] FLEWUG Comments at 11.

- annual committee progress reports on the recommendation of these technical and equipment standards must be submitted to the Commission, with updates submitted on a quarterly basis; and,

- the first such progress report shall be submitted to the Commission by the close of the second quarter after which the NCC is established and shall include a plan of action and milestones for the recommendation of each of these standards within this four-year time frame.

123. *Encryption*. Because interoperability channels will be used for sudden emergency and disaster response situations, which call for the widest possible access by various federal, state and local government public safety agencies, but only infrequently for tactical or covert operations, we conclude that Commission adoption of an encryption standard for the interoperability channels is not essential to ensure these channels are used effectively for interoperability purposes. Nevertheless, we encourage the public safety sector to develop voluntary encryption standards to facilitate its use in situations where secure interoperable communications are desired.

3. Technical Requirements for General Use and Reserve Channels

124. *Modulation Type*. We will first discuss the issue of whether we should allow or require the use of analog modulation or digital modulation (or both) for public safety systems in the 700 MHz band.[315] In the *Second Notice*, for the general use channels, we proposed to refrain from requiring either analog or digital technology, stating that, where nationwide interoperability is not required, it is preferable to allow public safety licensees to choose among available modulation technologies.[316]

125. FLEWUG supports our proposal not to specify a modulation type for the general use channels. FLEWUG believes that the public safety community, through the regional planning committees, should be allowed to decide what technology will best suit its needs.[317] Pennsylvania argues that the 700 MHz band should be reserved for digital modulation only, because it believes that equipment employing digital modulation is or will be available in the near future before capacity in the 821-824 MHz public safety band is depleted.[318] On the other hand, the City of Richardson, TX urges adoption of a requirement for analog modulation only.[319]

126. As stated previously, we believe that digital modulation technology is a very important factor in optimizing efficiency of spectrum use, and as such, it will be a key technology for the future of land mobile radio. Digital modulation is generally superior to analog modulation for data transmission, particularly image/HSD, and it provides a spectrally efficient means of transmitting video. As noted by PSWAC, equipment employing digital modulation offers a significant improvement in spectrum efficiency over the analog

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[315] In the *Second Notice*, we entitled sections primarily addressing the question of analog versus digital modulation "Transmission Technology", a more general term that seemingly could encompass many other issues as well. *See Second Notice*, 12 FCC Rcd 17,732-35 and 17,772-73.

[316] *See Second Notice*, 12 FCC Rcd 17,772.

[317] FLEWUG Reply Comments at 56.

[318] Pennsylvania Comments at 7-8.

[319] The City of Richardson, Texas Comments at 5.

technology in use by public safety systems today.[320] Yet, in spite of these advantages, digital modulation technology is not yet widely used in public safety wireless communications systems.

127. One factor that could be impeding conversion of public safety wireless telecommunications systems to digital modulation is that public safety entities already have a substantial investment in existing analog systems. Much of the existing analog equipment has an expected service life of as much as 20 years. Consequently, converting from analog to digital before the time when existing equipment is scheduled to be replaced would entail additional unbudgeted costs, which for many public safety organizations would be financially impractical.

128. There are, however, no existing public safety systems in the 700 MHz band. Although in the *Second Notice*, we suggested that it might be possible to modify existing 800 MHz public safety equipment to operate in the 700 MHz band, NPSTC advises that this is not likely to be feasible.[321] Because land mobile radio equipment (analog or digital) designed to operate in the 700 MHz band is not yet available, we are presented with a unique opportunity to ensure that spectrally efficient modulation technology is incorporated in public safety equipment for this band from the outset. For these reasons, we have decided to depart from our proposal to refrain from specifying analog or digital modulation for the general use spectrum in this band. We will instead require that *all* 700 MHz band equipment (general use, interoperability, and reserve) use digital modulation as its primary modulation mode.[322]

129. *Standards for Digital Modulation*. In the *Second Notice*, we proposed not to mandate either analog or digital modulation exclusively. Because these channels will be used public safety entities for internal communications, we reasoned that it would be preferable to allow public safety entities to independently select equipment and technologies that best satisfies their particular requirements.[323]

130. Most commenters addressing these issues agree that there is no need for the Commission to adopt either a specific technology or comprehensive technical standards for the general use channels.[324] Because nationwide interoperability is not required in this spectrum, we still believe that there is little, if any, need for our intervention in the process of adopting standards for operations on these channels, even though we have decided to mandate the use of digital modulation. We conclude that individual public safety licensees should be able to select the equipment and technologies that best meet their particular communications needs, and we therefore decline to mandate a particular digital technology or standards for general use or reserve channels.

131. *Trunking*. As a general rule, the Commission requires licensees to employ a trunking technology when they establish a two-way land mobile system that uses more than five channels in the frequency bands above 512 MHz.[325] In the *NPSPAC Report and Order* we decided, in regard to the Public Safety National Plan

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[320] *PSWAC Final Report* at 44.

[321] *See* NPSTC Comments at 35.

[322] We will allow mobile and portable units to have analog modulation capability as a secondary mode in addition to its primary digital mode.

[323] *Second Notice*, 12 FCC Rcd at 17,772-73.

[324] *See, e.g.,* FLEWUG Comments at 22; Florida Comments at 7; Ericsson Comments at 18.

[325] *See* 47 C.F.R. § 90.623(a).

(800 MHz band), to require trunking for public safety systems, except where it is shown that a requested alternative technology would provide comparable efficiency, or that a trunked system would not meet operational requirements.[326] We believe that our trunking policy has generally been successful in achieving efficient spectrum use. Accordingly, we will continue this policy and require trunking for systems using more than five narrowband channels in the 700 MHz band, except where it is demonstrated by a substantial showing that an alternative technology would provide comparable spectrum efficiency or that operational requirements would not be met.

132. Receiver Standards. As we previously noted, our recent policy has been to adopt only those rules necessary to limit interference between communications systems, and we have not generally specified performance or quality standards for receivers. For general use or reserve channels, the issue with regard to receiver standards is whether we need to adopt minimum performance specifications to support better interference analysis, allowing more intensive use of the spectrum. We agree that receiver specifications are helpful for planning and frequency coordination purposes. As Florida states, the vast majority of public safety agencies rely on Commission regulations or guidance from larger agencies and user advocate groups for technical specifications.[327] Thus, we will require that the RPCs establish reference values for adjacent channel selectivity, spurious response attenuation, and intermodulation rejection in their plans. This approach will allow public safety entities to avail themselves of competitive market choices while establishing a reference point for interference analysis. Additionally, a "reference receiver" would assist all parties, including the Commission, in resolving interference disputes.

4. Technical Standards for all 700 MHz Band Public Safety Equipment

133. *Interoperability Channel Capability*. In the *Second Notice*, we asked for comment as to whether we should require that all public safety mobile and portable radios for the 700 MHz band be capable of operating on all interoperability channels in that band.[328] We also sought comment on whether it is technically feasible to incorporate 700 MHz band interoperability channels into mobile and portable radios operating in the 800 MHz public safety band.[329] Moreover, we asked whether we should require that all public safety mobile and portable radios operating in the 700 MHz band be capable of operating on all public safety and commercial channels in that band, and whether this is technically feasible.[330]

134. The commenters generally support a requirement that all 700 MHz band public safety mobile and portable radios be capable of operating on all 700 MHz public safety channels and particularly on all of the nationwide interoperability channels.[331] FLEWUG for example supports a requirement that all mobile and portable radios in the 700 MHz band be capable of operating on all voice and data interoperability channels

[326] *National Plan Report and Order,* 3 FCC Rcd at 909-10 (1987).

[327] Florida Comments at 7.

[328] *Second Notice*, 12 FCC Rcd 17,740.

[329] *Id.*

[330] *Second Notice*, 12 FCC Rcd 17,774.

[331] *See e.g.* comments of FLEWUG at 23, Florida at 3, California at 24, NPSTC at 19.

in the band, but not on all commercial channels in the band.[332] Some of these same commenters believe that this requirement should be extended to equipment in the 800 MHz band only, however, after a period longer that the one year proposed by the Commission.[333] Region 49 (central Texas) says that the Commission should mandate the inclusion of the interoperability channels in all new public safety radios.[334]

135. We are adopting a rule to require that all narrowband mobile and portable 700 MHz band public safety radios be capable of operating on all of the narrowband nationwide interoperability channels.[335] We believe it is not appropriate at this time to adopt a similar requirement for the wideband interoperability channels, because different and unrelated applications could be used on different channels. The commenters further advise that there should be no requirement to operate on the commercial portions of the band at this time.[336] We agree that such a requirement is premature until such time as it is determined how the commercial portion of the 700 MHz band will be used.

136. *Emission Limitations*. Emission limits are transmitter performance specifications that are necessary to minimize interference to communications systems operating in other channels or bands. Their purpose is to restrict the level of emissions that are unavoidably transmitted into adjacent channels and other parts of the spectrum. To maximize spectrum efficiency, it is desirable to utilize the full extent of the channel in order to maximize information transfer and thus ensure efficient use of the 700 MHz band.[337] At the same time, emission limits must be carefully selected to provide acceptable adjacent channel protection. In the *Second Notice*, the Commission asked whether the RPCs should be allowed to develop their own emission masks for the new 700 MHz band.[338] We also sought comment on whether particular emission masks already in our rules should be applied in the new band for different types of communications.[339] Specifically, we requested comment on whether the 12.5 kHz or 25 kHz emission masks for voice and data currently set forth in the Commission's Rules[340] should be adopted for the 700 MHz band.[341] We also solicited information on requirements for image/HSD and video.

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[332] FLEWUG Comments at 23.

[333] Florida Comments at 3.

[334] Region 49 Comments at 2.

[335] *See* new § 90.547 in Appendix E.

[336] Comments of Florida at 7, FLEWUG at 23.

[337] Emission mask is the technical specification that limits the distribution of power of a radio transmitter as a function of frequency.

[338] As a related matter, the Commission asked whether it should require an affidavit from equipment manufacturer to be submitted with any Regional Plan containing a regionally developed emission mask, attesting to the appropriateness of the parameters.

[339] Emission masks, which are schedules of attenuation as a function of displacement frequency, are the Commission's traditional method for limiting out of channel and out of band emissions.

[340] *See* Section 90.210 of the Commission's Rules, 47 C.F.R. § 90.210.

[341] *Second Notice*, 12 FCC Rcd at 17,775-76.

137. NPSTC, in its initial comments, supports using a 12.5 kHz emission mask, requests that the mask for 25 kHz be broadened to better accommodate data, and suggests that the designator for wide band 150 kHz channels await further action of Project 34.[342] As an alternative to emission masks, Motorola suggests an alternative approach, termed "adjacent channel coupled power" ("ACCP"), that Motorola asserts is flexible and has technical specifications that better address real-world conditions.[343] ACCP is an industry-developed method to assess compatibility within the complex channel environment resulting from the initial *Refarming Report and Order*.[344] Motorola claims that this new approach would better accommodate future technologies and eliminate some of the interpretation problems associated with emission masks that depend on specific spectrum analyzer characteristics. Motorola states that the specifications based on coupled power more directly relate to current radio system design, and it claims that the definition of absolute and relative levels of coupled power as a function of frequency should result in systems that operate with more predictable and lower levels of interference. Ericsson supports the coupled-power concept as recommended by Motorola, but indicates that the specific attenuation values proposed by Motorola may need additional study.[345]

138. As wireless communications evolve, the complexity of determining compatibility between different types of systems increases. Historically, public safety communications systems consisted of analog 25 kHz FM for voice communications. Recent years have seen the increased use of mobile data terminals, but generally most data applications have been accommodated within the channel and technical requirements designed for voice transmissions. Commission specifications typically involve fairly straightforward rules denoting authorized bandwidths and emission masks. The 700 MHz band, however, offers the opportunity for public safety agencies to enter full-scale into digital communications. The Commission's rules must keep pace with and recognize the diversity of equipment that will become available in the future. As we have said, the Commission should adopt regulations that encourage and do not inhibit the continuously evolving equipment market in ways that favor competition without favoring any particular technology. Consequently, rather than specifying emission masks for the various types of communications in the 700 MHz band, we will specify emission limits based on ACCP, as suggested by Motorola.[346] The questions raised by Ericsson relate principally to emission types that have bandwidths that would exceed the wideband 150 kHz aggregated limit we are adopting herein. Moreover, the ACCP limits offer a reasonable solution to the extent that these questions also relate to emission types that have a bandwidth less than 150 kHz. Specifically, the use of ACCP emission limits will ensure appropriately that the adjacent channel interference potential of transmitters—producing emissions of the various possible different bandwidths— is consistent and predictable. Also, the measurement procedure for ACCP requires the instrumentation to be set in a manner that simulates actual receivers. Therefore, the measured results will be more comparable to real world experience than if the emission mask method were to be used.

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[342] NPSTC Comments at 41-42. APCO Project 34 is a new program undertaken to develop wideband digital radio technology standards for the transport of image/HSD transmissions.

[343] Motorola Comments at 16, Appendix A, sections 2.4 and 3.2; Ericsson Reply Comments at 6.

[344] *See Refarming Report and Order,* 10 FCC Rcd at 10,120.

[345] Ericsson Reply Comments at 7. In a subsequent ex-parte submission, Ericsson alleges that lesser attenuation values may be more appropriate for off-the-shelf commercial wideband technology.

[346] The ACCP limits cover displacement frequencies up to and including the receive band. On all frequencies not covered by the ACCP limits, the general out-of-band attenuation formula, $A_{dB} = 43 + 10 \log p$, will apply. *See* § 90.210(l).

139. *Frequency Stability*. Frequency stability is an equipment design parameter that affects adjacent channel interference potential, and can thus impact the efficient use of the spectrum. The *Second Notice* sought comment on whether to use the same requirements in the 700 MHz band as are currently used in the 806 MHz band, which is 1.5 parts per million (ppm) for fixed stations and 2.5 ppm for mobile stations.[347] NPSTC and Motorola were the only commenters to address these specifications. NPSTC supports 1.5 and 2.5 ppm for fixed and mobile equipment, respectively. Motorola suggests values for a variety of equipment types -- narrowband as well as wideband equipment. To account for both types of equipment, we will adopt the following specifications based on Motorola's comments: 100 parts per billion (ppb) for narrowband base stations; 2.5 ppm[348] for narrowband mobiles or portables; 100 ppm for wideband base stations; and 5 ppm[349] for wideband mobiles or portables.

140. *Authorized Bandwidth*. Authorized bandwidth is defined in Part 90 of our rules as the frequency range wherein 99 percent of the power of the electromagnetic emission from the authorized transmitter must be confined.[350] To determine the authorized bandwidth, we generally use either the necessary bandwidth, a calculated parameter, or the occupied bandwidth, a measured parameter. Necessary bandwidth is used as the first portion of the emission designator, a data element that is in turn used for licensing, frequency coordination and international notification purposes.[351] We note that authorized bandwidth is not necessarily the same value as the channel size or spacing.[352] In some services, the authorized bandwidth exceeds the channel size. For example, the maximum authorized bandwidth for the 25 kHz channels in the 806-821/851-866 MHz bands is 20 kHz, while the authorized bandwidth for the 12.5 kHz channels in the 821-824/866-869 MHz bands is also 20 kHz.[353]

141. The *Second Notice* sought comment on the authorized bandwidth for different types of communications: voice, data, image/HSD, and video.[354] Among the comments received on the technical issues, all urge that the maximum authorized bandwidth be less than the channel size, with many suggesting various specific values such as 11.25 kHz authorized bandwidth for a 12.5 kHz channel size.[355]

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[347] *Second Notice*, 12 FCC Rcd at 17,775-76.

[348] Approximately 0.4 ppm by automatic frequency control (AFC) locking to base station with intermittent degradation to 2.5 ppm when AFC lock is lost.

[349] Approximately 1.25 ppm by AFC locking to base station with intermittent degradation to 5 ppm allowed if AFC lock is lost.

[350] *See* 47 C.F.R. § 90.7.

[351] *See* 47 C.F.R. § 2.202.

[352] Authorized bandwidth is the frequency range within which 99 percent of the radiated power appears, extended to include any frequency upon which the power is at least 0.25 percent of the total radiated power.

[353] *See* Section 90.209 of the Commission's Rules, 47 C.F.R. § 90.209.

[354] *Second Notice*, 12 FCC Rcd at 17,774-75.

[355] *See, e.g.*, Region 20 Comments at 10; Florida Comments at 7; California Comments at para. 44.

142. As discussed above, the technical parameters for the 700 MHz band must accommodate the wide assortment of voice, data, and video transmissions that are currently technically feasible as well as future technologies that may not be envisioned at present. The rules must provide flexibility for the future while providing a framework that speeds the introduction of 700 MHz band equipment into the public safety market, as required by the 1997 Budget Act.[356] Although in some services, the authorized bandwidth exceeds the channel size, to do so complicates frequency coordination by increasing the necessary separation for adjacent channel facilities. Furthermore, the ACCP values we are adopting (see discussion above) will not permit substantial coupled power into adjacent channels. Accordingly, we will allow public safety entities to specify in applications and to use any authorized bandwidth that does not exceed the channel size.

143. *Transmitting Power and Antenna Height Limits*. In the *Second Notice*, we sought comments on whether the power and antenna height limitations specified for the 800 MHz band[357] should be applied to the 700 MHz band, and if not, we asked for comment on what other power and antenna height limits should be specified.[358] The few comments received on this issue varied in their response. NPSTC and Motorola recommend that the power and antenna height limits be dependent solely upon frequency coordination requirements.[359] As indicated by California,[360] however, the 800 MHz band requirements appear to have worked well to limit system coverage to reasonable distances. Therefore, we are adopting a rule that incorporates by reference the 800 MHz power and antenna height limits as specified in Section 90.635 of our rules, which provides a maximum of 1 kilowatt (30 dBW) and 304 m (1000 feet) above average terrain (AAT) for trunked and "urban" systems, 500 Watts (27 dBW) and 152 m (500 feet) for suburban-conventional systems, and sets of equivalency tables.

144. In addition, we adopt transmitter output power limits of 3 watts for hand held portable transmitters and 30 watts for mobile and control transmitters.[361] For control stations, we also adopt a requirement that the power output must be further reduced as necessary to ensure that the received power level into the fixed receiver (or fixed amplifier after the antenna in a fixed receiver network) does not exceed -85 dBm.[362] Finally, we are adopting Motorola's suggestion to require that mobile and portable transmitters be designed to have automatic power control (APC).[363] APC is a system capability that allows the system to automatically adjust the output power of mobile and portable transmitters in order to maintain the minimum transmitting power necessary for effective communications, and to reduce interference potential.

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[356] *See* 47 U.S.C. § 337(d)(1).

[357] The power and antenna height limitations for the 800 and 900 MHz band are the same. *See* Section 90.635 of the Commission Rules, 47 C.F.R. § 90.635.

[358] *Second Notice*, 12 FCC Rcd at 17,776.

[359] NPSTC Comments at 45; Motorola Comments at 15.

[360] *See* California Comments at para. 45.

[361] *See* NPSTC Comments at 45; Motorola Comments at 15.

[362] *See* NPSTC Comments at 45; Motorola Comments at 15.

[363] Motorola Comments at 15.

145. *Co-channel Interference Protection*. In the *Second Notice*, we sought comment on whether the Commission should apply to the 700 MHz band the co-channel protection criteria[364] specified for the 806 MHz band,[365] or alternatively, as permitted in the 821 MHz National Plan, permit the regions to determine their own criteria.[366] Commenters expressed no consensus. NPSTC and FLEWUG favored having the parameters set by a national planning committee, while California and others indicated that the RPCs should be permitted to establish the requirements. Florida recommended that we specify minimum interference criteria suggesting 40 dBµV/m desired to 30 dBµV/m undesired, but that we allow regions to adopt more stringent standards if desired. After reviewing the comments on this issue, we have decided to allow the RPCs to use the "40 dBµV/m + 3 miles" service contour standards and 5 dBµV/m interference contour method that is used by many regions in the 821 MHz band, rather than specifying a Commission standard. We will also allow the RPCs to use alternative methods, provided that the method used is approved by all adjacent RPCs. Our experience is that where criteria have been clearly set and appropriate inter-regional coordination has occurred, the regionally established criteria have worked well. Because there are several methods of implementing these criteria, we will not adopt a rule specifying any specific methodology at this time.

E. PROTECTION OF TELEVISION/DIGITAL TELEVISION (TV/DTV) STATIONS

1. Introduction

146. In this section, we discuss the protection requirements among public safety base and mobile stations, television (TV) stations,[367] and DTV stations[368] in the recently allocated 24 megahertz of spectrum for public safety use nationwide.[369] During the transition from analog to DTV service (DTV transition period), which ends December 31, 2006,[370] public safety entities must share the use of this 24 megahertz of spectrum with TV operations including both analog and digital stations. The *Second Notice* sought comment on the appropriate land mobile/TV sharing criteria for public safety use of these bands during the DTV transition period.[371] Specifically, the Commission was interested in determining the appropriate geographic separation

[364] Co-channel protection refers to the interference protection that a particular licensee provides to another licensee operating on the same channel in the same geographic area. The protection criteria are designed to minimize the likelihood of interference to base/mobile communications on the channels in the 800 MHz and 900 MHz bands, which are assigned to licensees on an exclusive basis.

[365] The power and antenna height limitations for the 800 and 900 MHz band are the same. *See* Section 90.635 of the Commission Rules, 47 C.F.R. § 90.635.

[366] *Second Notice*, 12 FCC Rcd at 17,776-77.

[367] Existing TV stations use the traditional analog (NTSC) format.

[368] DTV refers to any technology that uses digital techniques to provide advanced TV services such as high definition TV, multiple standard definition TV, and other advanced features and services.

[369] *See Reallocation Report and Order*, 12 FCC Rcd 22,953.

[370] The DTV transition period will end December 31, 2006, but may be extended in some markets for the reasons enumerated in the 1997 Budget Act § 3003. *See, also, Reallocation Report*, 12 FCC Rcd at 22,953.

[371] *See Second Notice*, 12 FCC Rcd at 17,778-79.

requirements needed to protect TV reception as required by the 1997 Budget Act.[372] The 1997 Budget Act also required us to consider rules to ensure that public safety licensees are not subject to harmful interference from TV and DTV stations.[373]

147. The *Second Notice* proposed a 40 dB desired to undesired (D/U) signal ratio for co-channel operations and a 0 dB D/U signal ratio for adjacent channel operations to determine the geographic separation needed between public safety base stations and the Grade B service contours of co-channel and adjacent channel TV stations.[374] The D/U signal ratio is used to determine the level of land mobile signals that can be permitted at TV receiver locations without degrading the TV picture to less than a defined picture quality. In other words, the D/U signal ratio indicates what relative levels of TV and land mobile signals can be tolerated without causing excessive interference to TV reception. The determination of the appropriate D/U ratio in this case is based upon a number of factors, including the definition of acceptable picture quality,[375] TV receiver susceptibility,[376] antenna characteristics,[377] and aggregate interference caused by multiple land mobile signals. Certain technical parameters such as picture quality are subjective and others such as TV receiver susceptibility vary widely.[378] This makes it difficult for parties to agree on an appropriate D/U value that would provide sufficient protection for analog and digital TV reception without being overly protective and unnecessarily prohibiting the use of valuable public safety spectrum.

148. In making our determination, we note that land mobile and TV services have successfully shared the 470-512 MHz band (TV Channels 14-20) in eleven major cities since the early 1970's.[379] To protect

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[372] *See* 47 U.S.C. § 337(d)(2).

[373] *See* 47 U.S.C. § 337(d)(4).

[374] *See Second Notice*, 12 FCC Rcd 17,803.

[375] The reference picture quality used in establishing sharing criteria in the 470-512 MHz band was "Passable." The term "Passable" is defined as "The picture is of acceptable quality. Interference is not objectionable." *See* "Engineering Aspects of Television Allocations," Report of the Television Allocations Study Organization (TASO) to the Federal Communications Commission, March 1959. This is the same picture quality used by the Commission to determine TV Grade B service coverage. *See Sixth Report and Order* in Docket Nos. 8736, 8975, 8976 and 9175, April 11, 1952. The same picture quality was used so that land mobile interference to TV would not be more than "equally objectionable" as TV to TV interference.

[376] In connection with the *UHF-TV Sharing NPRM*, the FCC's Laboratory performed TV receiver susceptibility measurements. *See* FCC Office of Engineering and Technology Report, "Receiver Susceptibility Measurements Relating to Interference between UHF Television and Land Mobile Radio Services, February 1987. The tests showed the median value for receiver susceptibility to be 45 dB.

[377] The directional characteristics (front-to-back ratio) and polarization (horizontal vs. vertical) of UHF-TV receiving antennas discriminate against land mobile interference.

[378] Susceptibility ratios for receivers vary from model to model, and for a given receiver will depend on the modulation of the interfering signal, the number of interfering signals present, and their frequency relative to the desired TV visual carrier. Because of these variabilities, susceptibility ratios are often described by a range of values.

[379] *See* 47 C.F.R. § 90.303.

against potential land mobile interference to and from TV stations, the Commission established land mobile/TV sharing criteria.[380] Under the criteria adopted for the 470-512 MHz band, land mobile base stations must be located within 80.5 km (50 mi) of the geographic centers of these eleven cities.[381] Land mobile base stations also must meet certain geographic separation requirements from co-channel and adjacent channel TV stations.[382] For co-channel operations, the geographic separations are based upon providing a signal ratio of at least 50 dB[383] between the desired TV signal and undesired co-channel land mobile signal (D/U signal ratio) at a hypothetical 88.5 km (55 mi) Grade B service contour.[384] For protection of first adjacent channel TV operations, the geographic separation requirements are based on a D/U signal ratio of 0 dB at the same hypothetical Grade B service contour.[385] These separation distances also would protect the land mobile systems from interference from the TV stations.

149. In 1985, the Commission proposed to expand land mobile/TV sharing to other TV channels and proposed that the geographic separation requirements for co-channel operations be based on a D/U signal ratio of 40 dB rather than 50 dB.[386] In doing so, the Commission stated that the 50 dB ratio was too conservative and that a 40 dB ratio would result in minimal impact on co-channel TV service.[387] That proceeding was put on hold pending completion of the DTV proceeding, which has now been completed.[388] We now seek a

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[380] *See* Amendment of Parts 2, 89, 91, and 93, Geographic Reallocation of UHF-TV Channels 14 through 20 to the Land Mobile Radio Services for Use Within the 25 Largest Urbanized Areas of the United States, Docket No. 18261, *First Report and Order*, 23 FCC 2d 325, 342 (1970) (*Geographic Reallocation First Report and Order*).

[381] Mobile and control stations have to be located within 48 km (30 mi.) of their associated base station. *See* 47 C.F.R. § 90.305.

[382] Land mobile stations operating within the six megahertz occupied by a TV channel are considered co-channel. Land mobile stations operating within the six megahertz band directly above or below a TV channel are considered to be adjacent channel. *See* 47 C.F.R. § 90.309.

[383] For TV Channel 15 in New York City, a 40 dB D/U signal ratio is used. *See* 47 C.F.R. §§ 90.307(b) and 90.309 (Table B). A 50 dB protection ratio means that the amplitude of the desired TV signal is more than 300 times greater than the amplitude of the undesired signal at the Grade B service contour. A 40 dB protection ratio means the desired TV signal is 100 times greater.

[384] The 88.5 km (55 mi) Grade B service contour (64 dBuV/m) is based on a hypothetical TV station operating at an effective radiated power of one megawatt, a transmitting antenna height above average terrain of 610 meters (2000 feet) and the Commission's R-6602 F(50/50) curves. *See* 47 C.F.R. § 73.699. Maximum facilities for TV stations operating in the UHF band are 5 megawatts effective radiated power at an antenna HAAT of 610 meters (2,000 feet). *See* 47 C.F.R. § 73.614.

[385] A 0 dB D/U ratio means that the undesired signal can be as great as, but no stronger than the desired TV signal at the Grade B service contour.

[386] *See* Amendment of the Rules Concerning Further Sharing of the UHF Television Band by Private Land Mobile Radio Services, GEN Docket No. 85-172, *Notice of Proposed Rulemaking*, 101 FCC 2d 852, 861 (1985) (*UHF-TV Sharing NPRM*).

[387] *See UHF-TV Sharing NPRM*, 101 FCC 2d at 862.

[388] *See Sixth Report and Order*, 12 FCC Rcd 14,588.

reasonable balance among the needs of existing TV and new DTV stations in this band, public safety needs during the DTV transition period, and the potential interference which may be caused to all these operations. In the 470-512 MHz band, the Commission relied on minimum separation distances based on the various heights and powers of the land mobile stations to prevent harmful interference.[389] Since this method has been successful, we will continue to administer protection criteria for these services in this same manner. In making our determination herein, we examined the previous methodology with consideration of the more recent technological changes, the physical characteristics of the 700 MHz band, and the goals Congress established for us in the 1997 Budget Act.

2. Protection of TV Stations

150. The issue of what constitutes adequate interference protection to TV reception in land mobile/TV sharing arrangements has always been a contentious one. Thus, it is not surprising that the commenters did not agree on what D/U signal ratio should be applied. In general, there are two opposing points of view. The broadcasters argue that the comments in support of a lower D/U signal ratio standard (*i.e.*, 40 dB) are unsubstantiated by technical evidence and that the record supports setting geographic spacing requirements based on, at a minimum, a 50 dB D/U signal ratio.[390] For the same reason, they state that any proposal to reduce the protection even further as suggested by some commenters should be rejected.[391] They argue that adopting less stringent protection criteria than those typically used in the 470-512 MHz band (*i.e.*, 50 dB) will result in an unacceptable loss of TV service, a result that contradicts Congressional intent.[392]

151. The public safety community and several land mobile equipment manufacturers, on the other hand, support our proposal to use a D/U signal ratio of 40 dB to determine geographic separation requirements for co-channel operations.[393] They contend, however, that adopting the lesser D/U signal ratio of 40 dB is still too conservative and that additional reductions should be considered in order not to unduly restrict public safety use of the 24 megahertz of spectrum during the transition period.[394] Motorola recommends that the Commission include an additional 20.3 dB reduction in the ratio, which includes a 5.3 dB loss for the greater path loss associated with transmissions in the 746-806 MHz band as compared to transmissions in the 470-512 MHz band and a 15 dB reduction for antenna front-to-back ratio.[395] This would provide a 19.7 dB D/U signal ratio (40 dB - 20.3 dB) for determining the geographic separation requirements between TV and public safety base stations.[396] Motorola states that applying this additional 20.3 dB reduction will allow full power (1 kw)

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[389] *See UHF-TV Sharing NPRM*, 101 FCC 2d at 865.

[390] *See, e.g.*, AMSTV/NAB Comments at 4-5; Jovon Broadcasting Corporation (Jovon B/C) Comments at 2-6; Liberman Television, Inc. (Liberman TV) Reply Comments at 2.

[391] *See, e.g.*, MSTV/NAB Reply Comments at 4.

[392] *See, e.g.*, MSTV/NAB Reply Comments at 2-3.

[393] *See, e.g.*, NPSTC Comments at 47.

[394] *See, e.g.*, Motorola Comments at 20-21.

[395] The front-to-back ratio of an antenna is the ratio of the maximum gain in the forward direction (the main lobe) and the gain in the reverse direction, 180° from the main lobe.

[396] *See, e.g.*, Motorola Comments at 20-21.

public safety base stations to be located within 145 km (90 mi) of co-channel TV stations rather than 185 km (115 mi) and 241 km (150 mi) for 40 dB and 50 dB signal ratios, respectively.[397]

152. We have carefully reviewed all the technical information submitted. The suggestion made by the broadcasters to retain a 50 dB D/U signal ratio is too conservative and seems to be based on a desire to keep the status quo without taking into consideration new technology or differences in propagation of the frequency bands. We believe that this would unnecessarily inhibit the use of the 700 MHz band by public safety entities during the DTV transition period and cannot justify keeping the old value of 50 dB unless it is based on a technical showing which we find lacking in the record. On the other hand, while the recommendations put forth by some commenters would allow more public safety entities to use the 700 MHz band prior to the end of the DTV transition (December 31, 2006), the record before us does not support reducing the D/U signal ratio to the degree suggested based on ideal or optimistic situations. The plan developed for TV/land mobile sharing in 1970 was deliberately very conservative in order to safeguard against any possible adverse impact on TV reception.[398] Use of a 40 dB signal ratio is, for purposes of the instant proceeding, further supported by our experience with using this standard to protect TV service from interference from land mobile operations in the New York metropolitan area without serious adverse consequences. Therefore, we are adopting a 40 dB D/U signal ratio for calculating co-channel geographic separation requirements. We believe that the 40 dB D/U signal ratio is a reasonable value that will provide sufficient TV protection, as prescribed by the 1997 Budget Act. Co-channel land mobile base station transmitters will be limited to a maximum signal strength at the hypothetical TV Grade B contour 40 dB below 64 dBu, or 24 dBu.[399] We are adopting a 0 dB D/U signal ratio for adjacent channel operations as described in the *Second Notice*.[400] Adjacent channel land mobile transmitters will be limited to a maximum signal which can equal the TV Grade B signal of 64 dBu at the TV station Grade B contour of 88.5 km (55 miles). A typical TV receiver's adjacent channel rejection is at least 10-20 dB which will further safeguard TV from land mobile interference.

3. Protection of DTV Stations

153. In the *Second Notice*, the Commission noted that its tentative proposals were based on protecting analog TV and asked for comments on the appropriate D/U signal ratios that should be applied to protect DTV.[401] In doing so, the *Second Notice* stated that DTV transmissions could exhibit a greater resistance to interference than analog transmissions and therefore, DTV stations may be able to accept a lesser standard of

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[397] *See* Motorola Comments at 21. Under the Commission's proposal of using a 40 db D/U signal ratio, full power (1 kw) base stations can be located as close as 185 km (115 miles) if the antenna height is 30.5 m (100 ft) or less. Using a 50 dB D/U signal ratio would require land mobile base stations, with a 30.5 m (100 ft) antenna height, to be located at least 241 km (150 mi) from the TV station.

[398] *See Geographic Reallocation First Report and Order*, 23 FCC Rcd at 348.

[399] In terms of miles, if everything else is the same, a 40 dB D/U ratio rather than a 50 dB D/U ratio allows base stations to be located approximately 48.3 km (30 mi) closer to a co-channel TV station. *See* 47 C.F.R. § 90.309, Tables A & B.

[400] *See Second Notice*, 12 FCC Rcd at 17,801-17,805.

[401] *Id.* at 17,803-17,804.

protection.[402] The broadcasters argue that there is insufficient technical data to set interference protection standards for DTV and suggest the Commission form a committee composed of all interested parties to oversee scientific testing.[403] Motorola contends that given the more robust quality of the DTV signal, the same protection used for analog TV stations can be applied to DTV stations without experiencing serious interference.[404]

154. In the *UHF-TV Sharing NPRM*, the Commission established a Land Mobile/UHF Television Technical Advisory Committee to provide assistance to the Commission regarding additional land mobile/TV sharing.[405] Although this committee provided useful information, no agreement on the appropriate sharing criteria was reached.[406] Because the 1997 Budget Act directs the Commission to establish technical restrictions necessary to protect DTV service during the transition period,[407] we believe that the most expedient approach is to proceed on the DTV information currently on record with the Commission. Thus, we decline to establish such a committee at this time and are adopting rules as mandated by the 1997 Budget Act. We would re-examine this matter if a consensus agreement was presented by the parties.

155. After examining the record, we have decided to apply similar criteria adopted herein for protecting reception of analog TV stations to protecting DTV reception.[408] Since the Commission allocated DTV channels to replicate existing TV stations service areas,[409] we will allow the public safety stations to provide the same field strength at the equivalent Grade B contour of the DTV station as they do for an analog TV station and adjust the D/U ratio accordingly. We allowed a TV station to have protection ratios of 40 dB for co-channel and 0 dB for adjacent channel at its 64 dBµ field strength contour. The equivalent ratios for a DTV station 41 dBµ field strength contour are 17 dB and - 23 dB, respectively. In making this determination, we note that in the *Sixth Report and Order* in MM Docket No. 87-268, the Commission specified a minimum geographic separation of 250 km (155 mi) for co-channel operations between DTV stations and the city-center in the areas where there are existing land mobile operations.[410] Section 90.305(a) of our rules provides that maximum facility land mobile base stations can be located up to 80.5 km (50 mi)

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[402] *Id.* at 17,803.

[403] *See,* MSTV/NAB Comments at 8-9; Jovon B/C Comments at 6.

[404] *See*, Motorola Reply Comments at 7.

[405] *See* Amendment of the Rules Concerning Further Sharing of the UHF Television Band by Private Land Mobile Radio Services, GEN Docket No. 85-172, *Memorandum Opinion and Order,* 50 Fed. Reg. 32,488 (August 12, 1985) (*UHF-TV Sharing MO&O*).

[406] *See* Land Mobile Radio/UHF Television Technical Advisory Committee, Final Report, May 7, 1986.

[407] *See* 47 U.S.C. § 337(d)(2).

[408] A TV station's hypothetical Grade B contour is plotted based on a 64 dBµ signal strength using the F(50,50) curve. *See* 47 C.F.R.. § 73.699. A DTV station's equivalent contour is based on a 41 dBµ signal strength using the F(50,90) curve. *See* 47 C.F.R. § 73.625.

[409] *See Sixth Report and Order,* 12 FCC Rcd 14,681.

[410] *See Sixth Report and Order,* 12 FCC Rcd at 14,664. *See also,* 47 C.F.R. § 90.303(a) for the areas where TV/land mobile sharing is currently permitted.

from the city-center of one of the specified cities.[411] Consequently, under the geographic separation adopted in the *Sixth Report and Order*, a maximum facility land mobile base station could choose to locate its station as close as 169.5 km (250 km - 80.5 km), or 105 miles. At this distance, the land mobile base station would provide an interfering signal at the DTV station's 88.5 km (55 mi.) equivalent Grade B contour which would provide less than a 40 dB D/U protection ratio to a DTV receiver. Thus, our decision to require 700 MHz land mobile systems to provide signal ratios for DTV stations which will allow approximately the same separation distance as we did for analog TV stations, represents a reasonable balance between the needs of both DTV stations and public safety entities.

4. TV Protected Service Contour Alternatives

156. In the *Second Notice*, the Commission raised the issue of whether to protect TV reception based on a geographic separation table or to use a case-by-case approach and protect TV stations based on their actual Grade B contour. The *Second Notice* listed two possible approaches for specifying the TV protected Grade B service contour: (1) use a standard 88.5 km (55 mi) Grade B service contour, as we did previously; or (2) use the individual Grade B service contour based on the actual parameters of the TV license.[412] Under the first approach, the minimum separation distances could be put in a table, thus simplifying communication system planning. This approach would also give broadcasters who are operating at less than the "standard" parameters some flexibility to modify their facilities during the transition period without raising interference concerns. The *Second Notice* noted, however, that in the event of a less than maximum antenna height and full power station, the use of a standard Grade B service contour and geographic separation tables could unnecessarily inhibit public safety use of the spectrum by prohibiting stations that meet the D/U signal ratio requirement at the existing Grade B service contour.[413] To address this concern, the *Second Notice* discussed an alternative that bases protection on the actual operating parameters of a TV station (*e.g.*, it provides more of a case-by-case approach to examining interference).[414] Finally, the *Second Notice* discussed an additional option of permitting new licensees in this spectrum to reach agreements with licensees of protected TV stations that would be located closer than that permitted under the geographic separation requirements.[415]

157. The commenters favor geographic separation requirements in a table form similar to the current rules. NPSTC, for example, notes that "[w]hile the use of such tables may mean that the maximum optimization will not be achieved in each and every situation that might be available through the use of specific formulas that can perform calculations based on the exact values for the various characteristics such as ERP and HAAT, the ease of use of such tables and licensees' familiarity with them more than counteracts for the

[411] *See* 47 C.F.R. § 90.305(a).

[412] *See Second Notice*, 12 FCC Rcd at 17,803-17,804. The TV Grade B service contour is where the D/U signal ratio is applied. Thus, to determine the minimum geographic separation needed between public safety base stations and TV stations you add the two distances together (the distance of the public safety base station to the contour that meets the appropriate D/U signal ratio and the distance of the Grade B service contour from the TV station).

[413] *See Second Notice*, 12 FCC Rcd at 17,803-17,804.

[414] *See Second Notice*, 12 FCC Rcd at 17,804-17,805.

[415] *See Second Notice*, 12 FCC Rcd at 17,805.

minuscule loss of optimization."[416] MSTV/NAB also recommends that the Commission not protect TV reception on the basis of actual power and antenna height of a TV station, but instead use a table or hypothetical contour.[417]

158. We concur with the comments that a geographic separation distance table based on a standard 88.5 km Grade B service contour (equivalent Grade B for DTV) would be the most convenient form. We remain concerned, however, that limiting TV/land mobile separation to distances specified in a table may prevent public safety entities from fully utilizing this spectrum in a number of major metropolitan areas until after the transition period ends. We believe that it is necessary to provide alternative methods that will give flexibility to public safety entities to locate base stations closer than the distance specified in the separation table without causing excessive interference to TV/DTV stations. Therefore, we conclude that public safety applicants should be allowed to submit engineering studies showing how they propose to meet the appropriate D/U signal ratio at the existing TV station's authorized or applied for Grade B service contour or equivalent contour for DTV stations instead of the hypothetical contour at 88.5 km. This would permit public safety applicants to take into account intervening terrain and engineering techniques such as directional and down-tilt antennas in determining the necessary separation to provide the required protection. Public safety applicants who use the engineering techniques must however, consider the actual TV/DTV parameters and not base their study on the 88.5 km hypothetical or equivalent Grade B contour. Finally, public safety applicants will also be allowed to "short-space" (locate closer than the Table permits) if they get the approval of the TV stations they are required to protect. Thus, under the rules we adopt herein, public safety applicants can select one of three ways to meet the TV/DTV protection requirements: (1) utilize the geographic separation specified in the Table; (2) submit an engineering study to justify other separations which the Commission approves; or (3) obtain concurrence from the applicable TV/DTV station(s).

159. In the *Second Notice* we requested comment on whether the size of the reference TV contour should be increased because some TV stations have facilities exceeding those upon which the 88.5 km (55 mile) contour was based.[418] According to Sections 73.683 and 73.684 of the Commission's Rules, we stated that a TV station with parameters of 5 megawatts with an antenna HAAT of 610 meters could have a Grade B contour distance of 107 kilometers (66.5 miles).[419] In order to protect certain TV/DTV stations which have extremely large contours due to unusual height situations, such as a television station mounted on top of Mount Wilson near Los Angeles, California, we are incorporating an additional factor which must be used by all public safety base, control and mobile stations to protect these few TV/DTV stations and afford the land mobile stations the necessary protection from the TV/DTV stations. The equation necessary to calculate the additional distance from the hypothetical or equivalent Grade B contour is found in the rules section in Appendix E.

5. TV/DTV Protection from Control and Mobile Stations

160. The *Second Notice* asked for comments on whether the Commission should establish different separation distances for mobile and fixed stations operating in these bands.[420] The only comment we received

[416] *See* NPSTC Comments at 48.

[417] *See*, MSTV/NAB Reply Comments at 8.

[418] *See Second Notice* at 17,804.

[419] *See* 47 C.F.R. §§ 73.683-73.684.

[420] *See Second Notice*, 12 FCC Rcd at 17,804.

addressing this request was from Motorola in their letter of May 20, 1998.[421] In the preceding paragraphs, we discussed the TV protection requirements needed for base stations operating in a particular TV channel. In the 470-512 MHz band, this was all that was necessary because mobiles operated in the same TV channel as their companion base station.[422] Consequently, if you could use the TV channel for high power base station operations, you could also use it for lower-powered mobile operation. For public safety use of the 700 MHz band, however, control station and mobile operation will usually be on a different TV channel from its companion base station (*e.g.*, base operation on TV channel 63 and mobile operation on TV channel 68 - paired operation). If a particular TV channel is available for base station operations in a geographic area, it does not automatically mean that the paired TV channel is available for mobile operations.[423]

161. The Tables we incorporate into our rules to protect TV/DTV stations are found in Section 90.309 of the Commission's rules. These existing Tables cover co-channel protection based on a 40 dB D/U ratio using the separation methods described in Section 73.611 of the Commission's rules for base, control, and mobile stations, and for adjacent channel stations for base stations based on a 0 dB D/U ratio. However, the considerations under Section 90.309 were different in that mobiles were limited in their roaming distance from the base station, mobiles were on the same TV channel as the base station, and mobile to mobile communication was not allowed. Control and mobile stations (including portables) are limited in height and power and therefore shall afford protection to co-channel and adjacent channel TV/DTV stations in accordance with the values specified in Table D (co-channel frequencies based on 40 dB protection for TV and 17 dB for DTV) in § 90.309 of this part and a minimum distance of 8 kilometers (5 miles) from all adjacent channel TV/DTV station hypothetical or equivalent Grade B contours (adjacent channel frequencies based on 0 dB protection for TV and -23 dB for DTV). This means that control and mobile stations shall keep a minimum distance of 96.5 kilometers (60 miles) from all adjacent channel TV/DTV stations. Since operators of mobiles and portables are able to move and communicate with each other, licensees or coordinators must determine the areas where the mobiles can and cannot roam in order to protect the TV/DTV stations, and advise the mobile operators of these areas and their restrictions. Some of the methods used to determine distances and power levels are described in Section 90.309, and we find no reason to duplicate them. We will instead refer to them in the new rules. See Appendix E for the rules.

162. We have determined from our analysis that for systems using a control or mobile frequency on the same or adjacent TV/DTV channel, the control or mobile station shall use the same protection criteria for spacing as a base station. In other words, the control or mobile station needs to protect the hypothetical or equivalent Grade B contour to the same 40 dB signal ratio that a base station does for a co-channel TV stations (17 dB for DTV) and 0 dB for an adjacent channel TV station (-23 dB for DTV). Under the rules we adopt herein, public safety applicants can select one of three ways to meet the TV/DTV protection requirements: (1) utilize the geographic separation specified in the Table; (2) submit an engineering study to justify other separations which the Commission approves; or (3) obtain concurrence from the applicable TV station(s). See Appendix E for the rules.

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[421] *See* Letter from Motorola to Magalie Roman Salas, Secretary, Federal Communications Commission, dated May 20, 1998, at 2-3 (*Motorola ex-parte*).

[422] *See UHF-TV Sharing NPRM*, 101 FCC 2d at 873-874. *See also*, 47 C.F.R. § 90.311.

[423] Motorola states that there are only 18 cities in the top 50 U.S. markets for which a channel pair (63/68 or 64/69) can be found if TV transmitters must be more than 260 km from the city-center. *See Motorola ex-parte* at 4.

6. Protection of Public Safety from TV/DTV Stations

163. The 1997 Budget Act requires that we ensure that public safety licensees are not subject to harmful interference from TV and DTV stations.[424] To fulfill this mandate, we will require public safety base and mobile operations to have a safe distance between the co-channel or adjacent TV and DTV systems. This typically means that a co-channel and adjacent channel base and mobile system cannot operate in areas where TV stations already exist. The public safety systems that will operate in the 700 MHz band for some locations in the U.S. and its possessions must wait until the transition period is over and the TV/DTV stations have moved to other channels before beginning operations. In other areas, channels will be available for public safety operations. During the transition period, public safety stations must be acutely aware of the TV allocations for both TV and DTV stations. We desire to have the number of situations where the public safety licensee has to coordinate its station with the existing TV stations kept to a minimum. We also do not want to have any future TV stations coordinate with existing public safety systems in the 700 MHz band. We do not anticipate this to be a problem because the Commission's decisions in the reallocation of spectrum to DTV implemented two requirements which will help public safety systems to protect TV/DTV stations and reduce the number of coordinations. The first requirement is that conventional UHF-TV stations can no longer apply for channels 60-69 or modifications in channels 60-69 which would increase the stations' service areas, which creates a known environment for public safety licensees.[425] The second requirement is that since only existing TV station licensees can apply for DTV channels, the applicants and their proposed locations are already known.[426]

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[424] *See* 47 U.S.C. § 337(d)(4).

[425] *See Reallocation Report and Order*, 12 FCC Rcd 22,969-22,970. Stations with existing channel 60-69 TV construction permits must complete their stations and file for a license by January 2, 2001.

[426] *See DTV Sixth Report and Order*, 12 FCC Rcd 14,739-14,754; *See also* In the Matter of Advanced Television Systems and Their Impact upon the Existing Television Broadcast Service, *Memorandum Opinion and Order on Reconsideration of the Sixth Report and Order* in MM Docket No. 87-268, 13 FCC Rcd 7418 (1998). The 11 DTV allotments are:

STATE	CITY	NTSC TV Ch.	DTV Ch.	ERP (kW)	HAAT (m)
California	Stockton	64	62	63.5	874
California	Los Angeles	11	65	688.7	896
California	Riverside	62	68	180.1	723
California	Concord	42	63	61.0	856
Pennsylvania	Allentown	39	62	50.0	302
Pennsylvania	Philadelphia	6	64	1000.0	332
Pennsylvania	Philadelphia	10	67	791.8	354
Puerto Rico	Aguada	50	62	50.0	343
Puerto Rico	Mayaguez	16	63	50.0	347
Puerto Rico	Naranjito	64	65	50.0	142

164. We therefore conclude that public safety base and mobile systems can ensure reliable interference protection in the transition period from TV and DTV stations by using the same distance separations required of them to protect the TV/DTV stations to a D/U signal ratio of 40 dB for a TV and 17 dB for a DTV co-channel station and 0 dB for a TV and -23 dB for a DTV adjacent channel station. As new DTV stations begin to operate, their antenna heights and powers will be known and the public safety stations can use this information to assist them in engineering their systems. The mobile channel shall use the same criteria for spacing as the base station to ensure adequate protection.

F. CANADIAN AND MEXICAN BORDER REGIONS

165. Although we did not specifically mention in the *Second Notice* the requirement that public safety stations be coordinated along the U.S. borders with Canada and Mexico, applicants are familiar with our coordination requirements when U.S. stations are located near either of the borders and the Commission's requirement under international regulations to coordinate its intended use of the spectrum with Canada and Mexico.[427] In fact, two of the commenters recommend that the Commission make every effort to ensure some type of compatible use of the channels in its international agreements along the borders.[428] International coordination between the United States and Mexico and between the United States and Canada concerning the reallocation of spectrum from broadcast to public safety has begun but has not been completed.

166. In examining this issue, the Commission typically takes one of two approaches. We either postpone licensing of land mobile stations within a certain geographic distance (*e.g.*, 120 km (75 miles)) of Canada and Mexico, or permit interim authorizations conditioned on the outcome of future agreements. Because international negotiations can take many months or even years to finalize, we wish to take the later approach and adopt certain interim requirements for public safety licenses along the Canada and Mexico borders, providing that the licenses are subject to whatever future agreements the United States develops with the two countries. Nevertheless, existing mutual agreements with Canada and Mexico for the use of these bands for UHF television must be recognized until further negotiations are completed. Additionally, public safety facilities within the United States must accept interference from authorized channel 60-69 TV transmitters in Canada and Mexico in accordance with the existing agreements. Since the locations of the Canadian and Mexican assignments are known for UHF television, the public safety applicants can consider the levels of harmful interference to expect from Canadian and Mexican UHF TV stations when applying for a license. Both Canada and Mexico have been informally notified that the Commission has changed its allocated use of TV channels 60-69, and the Commission will discuss the possibility of mutually compatible spectrum use with Canada and Mexico.

167. For the above reasons, we adopt rules which specify that all systems within 120 km (75 miles) of the Canadian border (line A as defined in 47 C.F.R. § 90.7) or Mexican border be granted conditional

Puerto Rico	Aguadilla	12	69	691.8	665

[427] *See* 47 C.F.R. § 2.301 which describes station identification and use of frequencies with a view to the elimination of harmful interference and general enforcement of applicable radio treaties, conventions, regulations, arrangements, and agreements in force.

[428] NYS Police Comments at 8; FLEWUG Reply Comments at 2.

licenses until final agreements are signed. Licenses will be conditioned that harmful interference may not be caused to, but may be received from, UHF TV transmitters in Canada or Mexico, and that modifications may be necessary to comply with whatever arrangements are ultimately specified in future agreements with Canada and Mexico regarding the use of this band. Pending further negotiations, we also adopt the protection criteria for domestic TV and DTV stations as interim criteria for Canadian and Mexican TV and DTV stations.[429]

V. THIRD NOTICE OF PROPOSED RULE MAKING

168. In this *Third Notice*, we seek comment on how to license the 8.8 megahertz of spectrum in the 700 MHz band that has been designated as reserve spectrum in the *First Report*. We also ask how to license the 2.6 megahertz of spectrum in the 700 MHz band that has been designated as interoperability spectrum in the *First Report*. We also offer proposals to facilitate use of nationwide interoperability in public safety bands below 512 MHz. Next, we discuss protection requirements for the Global Navigation Satellite Systems.[430] Finally, we ask for comments related to the Year 2000 (Y2K) computer date change problem and efforts involving Y2K component identification, testing, repair, and contingency planning dealing with public safety radio systems themselves and the other equipment or systems on which these systems are dependent.

A. USE AND LICENSING OF RESERVE SPECTRUM

169. In accordance with the 1997 Budget Act, the Commission allocated 24 megahertz of spectrum in the 700 MHz band for public safety services.[431] Our *First Report* commences the licensing process for 12.6 megahertz of this new spectrum and designates another 2.6 megahertz of this new spectrum for nationwide interoperability. This *Third Notice* seeks comments regarding the appropriate use of the reserve frequencies -- 8.8 megahertz of the spectrum. For example, should the Commission license the 8.8 megahertz of spectrum pursuant to the RPC process? If not, should the Commission license the 8.8 megahertz of spectrum directly to each state to meet statewide public safety requirements? Alternatively, should the Commission hold the 8.8 megahertz in reserve for future use? We seek comment on these proposals, as well as any other alternatives for licensing administration of the 8.8 megahertz of public safety spectrum.

170. *RPC Process*. In 1986, the Commission allocated six megahertz of spectrum in the 800 MHz band for public safety use.[432] The Commission determined that active participation by the public safety

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[429] *See* TV/DTV protection criteria, paras. 152-157, *supra.*

[430] GPS (Global Positioning Service) is the civilian portion of the United States Global Navigation Satellite System (GNSS), made available for commercial use, which utilizes the Aeronautical Radionavigation-Satellite (space-to-earth) band of 1559-1610 MHz on a primary basis and is maintained by the United States Department of Defense. Our discussion also includes a section on the protection requirements for GLONASS. GLONASS is the Russian Federation Global Orbiting Navigation Satellite System.

[431] *Reallocation Report and Order*, 12 FCC Rcd 22,953 (1997).

[432] *See* Amendments of Part 2 and 22 of the Commission's Rules Relative to Cellular Communications Systems, Amendment of Parts 2, 15, and 90 of the Commission's Rules and Regulations to Allocate Frequencies in the 900 Reserve Band for Private Land Mobile Use, Amendments of Parts 2, 22, and 25 of the Commission's Rules to Allocate Spectrum for, and to Establish Other Rules and Policies Pertaining to the Use of Radio Frequencies in a Land Mobile Satellite Service for the Provision of Various Common Carrier Services, *Report and Order*, 2 FCC Rcd 1825, 1838 (1986).

community in the assignment of this new spectrum would be a priority.[433] In 1987, the Commission adopted service rules and technical standards for the 800 MHz band and established RPCs to (1) address spectrum requirements for all eligible entities, and (2) determine how the available spectrum could best be used to satisfy these requirements.[434] Participation in the RPCs was to be open to any eligible entity.[435]

171. We believe the RPC approach has been a reasonably successful method of ensuring that the public safety spectrum in the 800 MHz band was assigned fairly and efficiently and put to its most appropriate and efficient use. The RPC approach has also maximized spectrum efficiency and facilitated accommodation of a wide variety of public safety communication requirements in different areas throughout the Nation. In addition, those involved in the RPC process have had ten years of experience in spectrum management. Many commenters agree that the RPC approach has been successful.[436] Some commenters state that management of public safety spectrum is best handled on a local level and by a local organization— one that includes representatives from each discipline (police, fire, EMS, *etc*.) and each jurisdiction (state, county, city, *etc*.).[437] Moreover, several commenters suggest that the RPC process for the 800 MHz band has been successful in balancing the needs of one prospective user against the needs of other prospective users and urge the Commission to retain the RPC process for licensing and management of the public safety spectrum in the 700 MHz band.[438] We also note that sheriffs, local police, and special police clearly preferred local (multijurisdiction) planning over State, multi-State, or national interoperability planning according to a 1997 mail survey of the interoperability experiences and needs of law enforcement agencies across the Nation.[439]

172. Several commenters generally support the RPC process, but suggest that it could be modified to provide an even more efficient and effective method to regulate the assignment of spectrum.[440] The Commonwealth of Pennsylvania, for instance, generally supports the use of the RPC process, but notes that RPCs may lack adequate tools, training, and experience to effectively and efficiently assign spectrum.[441] The Joint Commenters, on the other hand, argue that the RPC process has been hampered by local politics,

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[433] *Id.* at 1869.

[434] *National Plan Report and Order*, 3 FCC Rcd at 905.

[435] *Id.* at 910.

[436] *See, e.g.*, note 199, *supra*.

[437] *See, e.g.*, The City of Richardson, Texas Comments at 2-3; City of Fort Lauderdale Reply Comments at 1; NYS Police Comments at 9.

[438] *See, e.g.,* California Comments at ¶ 31; Motorola Comments at 4.

[439] *See National Institute of Justice Research Report— State and Local Law Enforcement Wireless Communications and Interoperability: A Quantitative Analysis*, ix, 61 (Jan. 1998) (*NIJ Report*). The National Institute of Justice (NIJ) is a component of U.S. Department of Justice, Office of Justice Programs. The *NIJ Report* is the result of an NIJ-sponsored study designed to provide a baseline portrait of law enforcement agencies' experiences with wireless telecommunications equipment for routine operations and interoperability. *Id* at 79. A follow-on study is currently underway to collect similar information from the fire, emergency medical, and emergency management communities. *See id.* at ix.

[440] *See generally* FLEWUG Comments at 17-19; National League of Cities Comments at 5.

[441] Pennsylvania Comments at 9.

inadequate diversity of representation across the public safety community, lack of funding to introduce new technologies, and inability to coordinate statewide channel assignments[442] and advocate the creation of a state, rather than a regional, planning committee to manage the 700 MHz band public safety spectrum.[443] A number of states have been evolving to statewide systems as a cost-effective way of sharing advanced technologies with all jurisdictions and increasing the efficiency of public safety operations throughout the region. The RPC process may not lend itself as easily to these types of systems as a state-run process might.

173. We seek comment on the use of the regional planning approach to administer the 8.8 megahertz of spectrum reserved in the *First Report.* We also seek comment on whether we should retain the new RPC process established in the *First Report* for management of the 8.8 megahertz of spectrum or whether we should modify or refine the regional planning approach for this spectrum. We encourage commenters to suggest refinements and modifications to the RPC process that will provide an even more efficient and effective method of spectrum management.

174. *State Licensing*. The PSWAC Interoperability Subcommittee noted that shared systems, *i.e.*, large trunked systems that provide service to many governmental entities in a specific geographic area, offer a greater degree of spectrum efficiency than many smaller non-trunked systems or systems trunked on fewer channels.[444] Recent developments in trunking technology have made possible wide area radio systems that can accommodate many distinct user groups on the same system, each with their own insulated communications network. Trunking and other technologies that maximize spectrum use make it not only feasible to share systems with a larger universe of users but also to accommodate users from outside state government, including county or municipal governments,[445] federal government and even private users, that perform public safety-related functions.[446]

175. Deploying regional and state-wide systems may provide positive incentives for increasing access by all sectors of the public safety community to the benefit of advanced highly functional technologies. Obtaining the benefits of economics of scale and scope is one incentive for deploying a state-of-the art system that serves the entire state and/or region. States deploying such systems have an incentive to be as inclusive as possible in encouraging jurisdictions with public safety communications needs throughout the state to share the system because it will incrementally decrease the cost any one entity needs to bear for infrastructure build-out and allows a greater number of public safety jurisdictions to benefit from access modern technology at affordable prices. Thus, the substantial costs for transmission towers, other infrastructure and maintenance

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[442] Joint Commenters Reply Comments at 5.

[443] Joint Comments at 13-14.

[444] *PSWAC Final Report* at 317-318. Shared systems also offer a high level of built-in interoperability. *Id.*

[445] *See, e.g.,* State of Michigan system described in *PSWAC Final Report* at 734; State of Louisiana system described in *PSWAC Final Report* at 735.

[446] The State of Montana system is a public/private project being planned with the Montana Power Company and is projected to have federal users. *See* Letter from Ron Haraseth, Systems Analyst, State of Montana, to John Clark, FCC at 2 (March 26, 1998) (Haraseth Letter). The State of South Carolina/SCANA system is a partnership between the State and a private utility. Their jointly planned system involves contribution of infrastructure and Industrial/Land Transportation frequencies by SCANA and infrastructure and Public Safety and SERS frequencies by the State. *See* In the Matter of State of South Carolina and SCANA Communications Inc., *Order*, 13 FCC Rcd 8787 (1997) (South Carolina *Order).*

for such systems[447] can be more easily borne by including as many users on the system as possible in order to lower the per-user cost for the whole system. We seek comment on whether a regional or state-wide system would provide economies of scale and scope that would increase incentives to participate in the regional or state-wide system. We also seek comment on whether our decision in the *First Report* to allow states to "opt out" and redefine RPCs along state boundaries may provide enough increased flexibility necessary to achieve positive incentives for increasing system use without giving the spectrum directly to the states under a new licensing scheme.

176. Conceivably, states could use a state license to provide opportunities to introduce greater competition among equipment manufacturers, network designers, and software companies. Some states may even use the license to provide a "national stage" for local companies with worthwhile new approaches to spectrum-based innovation.[448] We seek comment on whether state governments have the policy and technical expertise to determine how best to increase the efficiency of public safety operations throughout the state through the deployment of spectrum-based technologies. We also seek comment on whether states have more or less policy and technical expertise in this area than those entities currently participating in the RPC process.

177. Promoting the use of spectrum to further safety of life and property is one of this agency's primary mandates. How these needs were met was highly dependent upon local professional and financial resources. We seek comment on whether by creating a regional or state-wide license, each state would have the incentive and expertise to experiment with many technology-based alternatives for better meeting the public safety concerns of all residents, not just the better-funded municipalities and counties. We also seek comment on whether the states would have the resources needed to promote the development of a state-wide system. We further seek comment on whether some states would have fewer resources than others and how this could affect the viability of grants of state licenses.

178. Over the past several years an increasing number of states have endeavored to construct state-wide systems. Systems have been built or planned in many states including South Carolina,[449] Virginia, California, New Hampshire,[450] Montana,[451] Florida,[452] Delaware,[453] Missouri, Pennsylvania, Louisiana,[454] Utah,

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[447] The State of Florida system, for example, is designed to employ 51 digital trunked channels and is projected to cost $336 million. *See* In the Matter of State of Florida, Request for Waiver of the General Category Freeze, *Order*, 12 FCC Rcd 11,567 (1997) (Florida *Order*).

[448] *Accord* Joint Commenters Reply Comments at 13 (arguing that Project 25 has had the unintended effect of producing a highly concentrated market for public safety equipment).

[449] *See* South Carolina *Order*, 13 FCC Rcd 8787.

[450] *See* In re Application of State of New Hampshire for Facilities in the Public Land Mobile service at Various Locations in the State of New Hampshire, File No. 27047-CD-P/L-94.

[451] *See* Haraseth Letter.

[452] *See* Florida *Order*, 12 FCC Rcd 11,567.

[453] *See* In the Matter of State of Delaware Station License Authorizations, GN Docket No. 89-573.

[454] *See PSWAC Final Report* at 735.

and Michigan.[455] The most significant difficulty in establishing state-wide, shared systems is that individual agencies and localities must surrender some autonomy.[456] Moreover, those administering a state-wide, shared system might be less responsive to local needs and requirements of rural areas and more responsive to the needs and requirements of the major metropolitan areas. We seek comment on whether the public interest would be served by licensing some or all of the 8.8 megahertz of reserved spectrum directly to the state in order to facilitate the construction of a state-wide system. We seek comment on how much, if any, of the reserved spectrum should be licensed to the state. In addition, we seek comment on whether the state should adhere to the same planning process as the RPCs. If so, we seek comment on whether the state's plan must contain the same elements as the RPCs plan, as adopted in the *First Report*. For example, the benefits of RPC planning include an open process, inclusion, and accountability. If we conclude that the public interest would be served by licensing some or all of the 8.8 megahertz of reserved spectrum directly to the state, what measures are appropriate to ensure that the state planning process is open, inclusive and accountable? Because no states have asked for state licensing and several states filed comments in support of the RPC, we specifically invite states to comment on these issues.

179. We also seek comment on whether the state government should be permitted both to use and share the use of these frequencies with its local, political subdivisions, as well as Federal and other public safety service providers. Further, we seek comment on whether additional licenses should be required or granted by the Commission to individual public safety agencies or whether a single license should be granted to the state, which would manage the use of its authorized spectrum statewide.[457] We seek comment on whether, other than interference protection to adjacent and co-channel operations, we should propose any restrictions on use of the state license other than that it serve the public safety needs of all the state's citizens. We seek comment on whether the aggregate limits of 25 kHz (narrowband) and 150 kHz (wideband) adopted today in the *First Report* is appropriate for state licenses,[458] and if not, what limits are appropriate for a state-wide system.

180. We also seek comment on the mechanics of granting licenses to the individual states. Specifically, should these frequencies be granted to the Governor, or his/her designee directly? Alternatively, should the Governor's use of the spectrum be coordinated with the elected legislature of each state? We also

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[455] *See PSWAC Final Report* at 734.

[456] *PSWAC Final Report* at 316-317.

[457] "Blanket" licensees generally do not need Commission approval prior to constructing or operating facilities within the scope of the license. However, the Commission's rules implementing the National Environmental Policy Act of 1969, as amended, 47 U.S.C. §§ 4321-4335, require "blanket" licensees to initially ascertain whether a proposed facility may have a significant environmental impact and, if so, the licensee must file required information and environmental processing (if invoked) must be completed prior to the initiation of construction. *See* 47 C.F.R. § 1.1312. Similarly, 47 C.F.R. Part 17 contains rules concerning the construction, marking, and lighting of antenna structures. Moreover, all 700 MHz stations will be subject to any power limitations imposed by international agreements, *see, e.g.,* 47 C.F.R. § 24.132(g), as well as Quiet Zone protection requirements, *see, e.g.*, 47 C.F.R.
§ 22.369.

[458] Herein, we are only addressing the 8.8 megahertz of reserve spectrum. As stated in the *First Report*, we believe these aggregation limits are appropriate for general use where several public safety entities need to be accommodated.

seek comment on whether any relevant differences in structures of various state governments would affect the licensing of this spectrum to a Governor in coordination with a state legislature.

181. *Other Alternatives*. We seek comment on what other flexible licensing approaches exist that might promote the development of a comprehensively planned, public safety communication systems in the 700 MHz band. We encourage commenters to suggest alternatives uses of this 8.8 megahertz of spectrum that would promote new and innovative ways to better serve public safety community. We also seek comment on whether some or all of the 8.8 megahertz of spectrum should remain in reserve pending future developments. If so, we seek comment on how much should remain in reserve.

182. *Administration of Interoperability Spectrum (2.6 megahertz designated in First Report)*. A total of 2.6 megahertz of the public safety spectrum in the 700 MHz band is designated in the *First Report* for nationwide interoperability pursuant to the guidelines to be established by the National Coordination Committee and approved by the Commission. To ensure seamless interoperability nationwide, these interoperable systems must be established in accordance with the technical and operational guidelines to be developed by the National Coordinating Committee.[459] We seek comment on whether the designated interoperability channels (2.6 megahertz of spectrum) are appropriate for direct state licensing because the development of 700 MHz band interoperable systems will likely be directed by the states or the larger political subdivisions within each state.[460] We also seek comment on how the state licensees would provide ongoing and uniform management of state-wide systems operating on the interoperability channels, thereby ensuring that use throughout the state remains compatible with the national interoperability guidelines. We seek comment on whether the states are an effective and appropriate "bridge" between local and Federal governments to facilitate the development of interoperable systems that will service all elements of the public safety community. We also seek comment on the use of the regional planning approach to license the 2.6 megahertz of interoperability spectrum and, if so, whether we should modify or refine the regional planning approach for this spectrum. We encourage commenters to suggest refinements and modifications to the RPC process that will provide an even more efficient and effective method of spectrum management, in accordance with the National Plan adopted in the *First Report.*

183. *Conforming Amendments to Section 90.179*. Section 90.179[461] of our rules provides that a licensee may share its system with other entities that are eligible to hold a license for the same spectrum. A station is shared when persons not licensed for the station control it for their own purposes pursuant to the licensee's permission.[462] Should we decide to license individual states, we will need to revise Section 90.179. Specifically, we seek comment on whether to revise Section 90.179 to allow a state licensees to authorize appropriate public safety agencies within the state and its political subdivisions to use the spectrum for their own purposes pursuant to the licensee's authorization. The state, as licensee, would be responsible for assuring

[459] The *First Report* establishes rules and policies that designate 2.6 megahertz of 700 MHz band spectrum for interoperability. We also define therein the framework for nationwide interoperability and establish a national planning process that will allow the public safety community to establish a national baseline(s) for operation and use of interoperability spectrum. *See First Report*.

[460] *See* section A of the *First Report.*

[461] 47 C.F.R. § 90.179.

[462] 47 C.F.R. § 90.179(a).

that the authorized facility is used only by persons and for purposes consistent with Section 90.179.[463] For example, if the state, as licensee, shares a land station on a non-profit, cost sharing basis, it must do so pursuant to a written agreement between the state and each participant that is kept as part of the station records.[464] We also seek comment on whether to amend Section 90.1 of the Commission's Rules to reflect that the scope of Part 90 does not govern the licensing of radio systems belonging to and operated by the United States.[465]

184. *Legal Authority*. This *Third Notice* seeks comments regarding the appropriate spectrum management process to use for the reserve frequencies (8.8 megahertz of spectrum) and also invite commenters to suggest alternative methods. We also ask whether the designated interoperability channels (2.6 megahertz of spectrum) should be licensed by means of the Regional Planning Committee process or licensed directly to each state. While our legal authority to adopt an RPC process is well established, we ask commenters to address the Commission's legal authority to adopt other approaches including alternatives described above or suggested in comments to this *Third Notice*.

B. INTEROPERABILITY BELOW 512 MHz

185. In this section, we continue and expand our examination of possible solutions to the lack of interoperability between and among government public safety entities. In the *Second Notice* we tentatively concluded that the establishment of nationwide interoperability channels is in the public interest and will significantly advance our goal of facilitating communication among public safety agencies.[466] Although we are taking actions herein to provide for significant interoperability in the 700 MHz band, we seek additional comments on interoperability needs below 512 MHz.

186. In response to the *Second Notice*, many commenters informed us that higher frequency bands, *i.e.*, the 700 MHz and 800 MHz bands, do not possess the long distance capability or propagation characteristics of lower frequencies.[467] Migration to the 800 MHz band has not been a viable option for many public safety agencies operating in rural areas usually due to investments in existing systems and the cost of migrating to a new system.[468] This results in fragmentation of the use of the spectrum in urban and non-urban areas. In many cases, state and local agencies now operate communication systems in different radio bands using different technologies which often render them incompatible. Similarly, federal agencies licensed by

[463] 47 C.F.R. § 90.179(b). As with current Section 90.179, the shared use of the spectrum licensed to the individual states would be predicated on the authorized user and the state complying with all the provisions of Section 90.179.

[464] *See* 47 C.F.R. § 90.179(d).

[465] *See* 47 U.S.C. § 305(a).

[466] *Second Notice*, 12 FCC Rcd at 17,727.

[467] *First Notice*, 11 FCC Rcd at 12,476; FLEWUG Comments at 11; APCO Comments at 8-9; DOT Comments at 9; Ericsson Comments at 11-12; New Hampshire Comments at 10; No. Cal. APCO Comments at 4; PG County Comments at 5; Powell Comments at 9.

[468] *First Notice*, 11 FCC Rcd at 12,465.

NTIA operate on non-contiguous frequencies scattered throughout the VHF and UHF bands.[469] Consequently, local, state, and federal public safety agencies often have only limited ability to communicate with each other. This inability to communicate hinders cooperation and coordination among public safety agencies on a day-to-day basis.[470]

187. The *PSWAC Final Report* proposes the establishment of interoperability channels, encouraging the development and use of shared systems, and of building gateways between technically incompatible Federal, state, and local public safety systems.[471] The *PSWAC Final Report* states that the diversity of public safety spectrum resources presents the first obstacle to interoperability.[472] Federal, state and local public safety agencies use a total of ten radio bands, ranging from 30 MHz to over 800 MHz, with no single, commercial grade radio having the capability of operating in all of these bands. Thus, individual public safety agencies may be prevented from communicating with another agency simply because their individual radio systems operate in different frequency bands.[473] Although the 821-824 MHz and 866-869 MHz bands are adjacent to frequencies already used for public safety purposes, we believe that most of public safety radio systems, especially smaller ones, operate in the VHF and UHF bands below 512 MHz. Locating interoperability channels above 512 MHz will not help these police officers, EMS technicians, firefighters, and other providers of public safety.[474] Also, some commenters to the *First Notice* indicated that the 800 MHz band is not as desirable as the bands below 512 MHz from a propagation standpoint.[475] These commenters also noted that interoperability channels should be located in these lower bands because of their proximity to current public safety operations.[476] The lack of interoperability channels, lack of a common communications mode and other technical, political and regulatory obstacles also stand in the way of interoperability.[477] Moreover, the 700 MHz band spectrum will not be available for public safety use in many of our largest cities until the end of the DTV transition period, which is scheduled for the year 2006.[478]

188. After review of the record before us, we tentatively conclude that locating interoperability channels in the 700 MHz and 800 MHz bands does not, standing alone, provide a comprehensive short term solution to the interoperability problem for either voice or data applications and that establishment of nationwide interoperability channels here is not mutually exclusive with the establishment of interoperability

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[469] *First Notice*, 11 FCC Rcd at 12,469.

[470] *First Notice*, 11 FCC Rcd at 12,469.

[471] *PSWAC Final Report* at 3*; First Notice*, 11 FCC Rcd at 12,472.

[472] *PSWAC Final Report* at 48-49.

[473] *Id.*

[474] Motorola Reply at 3; APCO at 11.

[475] *Second Notice*, 12 FCC Rcd at 17,727.

[476] *Id.*

[477] *PSWAC Final Report* at 48-49.

[478] *Allocation Report and Order*, 11 FCC Rcd at 14,682-84.

channels in other bands.[479] For this reason, we tentatively conclude that in addition to five interoperability channels in the 800 MHz band and the approximately 2.6 MHz we designate today for interoperability purposes in the 700 MHz band, we will include five nationwide interoperability channels located in the 150-174 MHz band and another 5 nationwide interoperability channels in the 450-512 MHz band to provide expeditious interoperability capability to public safety agencies and other providers not relocating in the near future to the 700 MHz or 800 MHz bands. We also seek comment on whether it is necessary to establish a nationwide interoperability band below 512 MHz. We discuss below the options of locating 10 interoperability channels in the 150-174 MHz and 450-512 MHz bands and locating interoperability channels in the 138-144 MHz band on a shared use basis.

189. In the Commission's *Maritime Third Report and Order*,[480] we concluded that designating two contiguous VHF maritime public correspondence channel pairs for public safety users in each inland VHF Public Coast Station Areas, but not in the maritime VPCs, would best further the public interest.[481] We stated that the ultimate use for these reserved frequencies, and the procedures for licensing this spectrum, shall be decided as part of this public safety proceeding.[482] In the section below entitled "Interoperability Channels from the VHF Maritime Band," we propose rules and procedures to allocate these channels as a short term solution for interoperability in many areas of the country.

1. Interoperability Channels in Existing Public Safety Bands

190. In the *First Notice*, we indicated that we were considering designating universal mutual aid channels or installing cross-band repeaters or gateways.[483] We added that we hoped inexpensive software programming could modify much of the mobile and portable equipment currently employed by the public safety agencies and retrofit them for operation on the interoperability channels.[484] We tentatively concluded that, possibly, the most expeditious way to provide an interoperability capability was to establish interoperability bands in frequencies that are preferably central and adjacent to existing public safety bands below 512 MHz for those public safety agencies that will not be moving to the 700 MHz or 800 MHz bands. As the best way to achieve this, we proposed to locate five nationwide interoperability channels at VHF 150-174 MHz, and another five nationwide interoperability channels at UHF 450-512 MHz. The establishment of these interoperability bands is in accordance with the findings and recommendations of the PSWAC.[485]

191. Five interoperability channels at the VHF band and another five at the UHF band are the best locations for providing immediate nationwide interoperability to a substantial sector of the public safety

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[479] *PSWAC Final Report* at 49.

[480] *See* In the Matter of Amendment of the Commission's Rules Concerning Maritime Communications, *Third Report and Order and Memorandum Opinion and Order,* PR Docket 92-257, FCC 98-151 (rel. July 9, 1998) *(Maritime Third Report and Order).*

[481] The channels designated in each inland VPC are set forth in the proposed rules in Appendix F.

[482] *See Maritime Third Report and O*rder at para. 31.

[483] *First Notice*, 11 FCC Rcd at 12,472.

[484] *First Notice,* 11 FCC Rcd at 12475.

[485] *PSWAC Final Report* at 52.

community with today's equipment because most law enforcement agencies have conventional analog systems that operate in high VHF bands.[486] Also, one dual-band radio that covers this band is already available.[487] Most commenters to the *First Notice* and in the *Second Notice* favor the establishment of this interoperability capability in one or more of these locations.[488] The Public Safety Communications Council (PSCC) proposed very specific channel locations in these two bands: five in the VHF band and four in the UHF band. These five VHF band recommendations are: 151.1375, 154.4525, 155.7525, 158.7375 and 159.4725 MHz. The four UHF band recommendations are: 453.20625, 453.99375, 458.20625 and 458.99375 MHz.[489] Another commenter listed several frequencies that it claims are mostly unused.[490] We propose to follow the PSCC proposal because it represents industries' view that these frequencies are viable and would not require another study to locate unused channels. We seek comment on these frequencies, including recommendations on a specific fifth UHF channel. We also seek comment on a requirement that every public safety mobile radio have the capacity to transmit and receive on at least one nationwide interoperability channel in the band in which it is operating.

2. Interoperability Channels in the 138-144 MHz Band

192. In the *First Notice*, the Commission said that it viewed relocating all public safety communications to a new band as a way of meeting interoperability needs, although we recognized that migration to a new public safety band would present several challenges and that a common interoperability standard for all public safety would be required.[491] We said that under this approach certain channels could be designated exclusively for nationwide mutual aid use.[492] Many commenters to the *First Notice* and *Second Notice* favored the reallocation of some amount of spectrum between 138 MHz and 512 MHz to immediately address interoperability needs.[493] The PSWAC ISC recommended allocating interoperability spectrum in the UHF band below 512 MHz and that these specific frequencies and frequency pairs be defined using developed Incident Command System (ICS) guidelines.[494] NPSTC supported this recommendation and proposed

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[486] National Institute of Justice, *Wireless Communications and Interoperability Among State and Local Law Enforcement Agencies*, January, 1998 (*NIJ Interoperability Study*), at 2.

[487] *First Notice*, 11 FCC Rcd at 12,484.

[488] FLEWUG Comments at 12; Quantum Comments at 4; Powell Comments at 10-11; Motorola Reply at 2; IACP at 3-5.

[489] Letter from Larry Miller to Kathryn Hosford at 1 (Dec. 5, 1997).

[490] Letter from Peter Szerlag to Secretary of the FCC at 1 (Oct. 7, 1997).

[491] *First Notice*, 11 FCC Rcd at 12,475.

[492] *First Notice*, 11 FCC Rcd at 12,469.

[493] *Petition of the National Public Safety Telecommunications Council for Further Rulemaking to Allocate Spectrum in the 138-144 MHz Band for Public Safety* (Apr. 9, 1998) (*NPSTC Petition*), at 2, 6; *PSWAC Final Report* at 21; NPSTC Comments at 8-9, Appendix A (proposing interoperability channel allocation plan for bands below 512 MHz); California Reply at 3; IACP Comments at 3-5; FLEWUG Comments at 8. The *NPSTC Petition* was placed on Public Notice on May 13, 1998 and will be handled in another proceeding. *See* Public Notice, "Office of Public Affairs Reference Operations Division Petitions for Rulemaking Filed," Report No. 2276 (rel. May 13, 1998).

reallocating 2.5 megahertz in the 138-144 MHz band.[495] NPSTC indicates that although the 138-144 MHz band is not scheduled by NTIA for reallocation until the year 2008, it will be cleared of most federal users before that time and could readily be used on a shared basis in the interim.[496] The *PSWAC Final Report* recommended this band for possible public safety sharing. NPSTC notes that FEMA is using it in emergencies to coordinate with state and local disaster response personnel.[497]

193. NTIA has recently identified 3 megahertz in the 138-144 MHz band for reallocation in response to the 1997 Budget Act; 139.0-140.5 MHz and 141.5-143 MHz.[498] This spectrum is currently used by the U.S. Department of Defense and the Federal Emergency Management Agency, which will relocate most of their operations to other frequency bands by the year 2008.[499] NPSTC states there will be indefinite use of this band at 36 military bases with areas of interference protection ranging in most cases from 50 to 65 kilometers from those locations.[500] NPSTC believes that the Commission, NTIA and Congress must carefully consider withholding a portion of the 138-144 MHz band from auctions and reallocating it for public safety use.[501] Since the foreseeable need for wideband data channels will be accommodated in the 700 MHz band, interoperability channels located in the 138-144 MHz band could be limited to those relatively few frequencies needed for voice interoperability purposes, which PSWAC ISC estimates to be 21 paired channels and 20 simplex channels.[502] The frequencies could be used with equipment employing the simple, inexpensive and easily accessible technical and modulation requirements, for example, a 2.5 kHz analog FM channel. These

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[494] *PSWAC Final Report* at 52.

[495] *NPSTC Petition* at 2, 6; *PSWAC Final Report* at 21.

[496] *NPSTC Petition* at 6.

[497] *NPSTC Petition* at 6; *PSWAC Final Report* at 58.

[498] Title III - Communication and Spectrum Allocation Provisions - of the Balanced Budget Act of 1997 requires the Secretary of Commerce to provide from the spectrum currently allocated for federal use, an aggregate of at least 20 megahertz below 3 gigahertz for allocation and assignment by the Federal Communications Commission to non-Federal users through the process of competitive bidding. In February 1998, the National Telecommunications and Information Administration, on behalf of the Secretary of Commerce, published a Spectrum Reallocation Report as required by Title III of the Balanced Budget Act of 1997. The Commission is required, not later than one year after receipt of the reallocation report, to prepare, submit to the President and the Congress, and implement a plan for the immediate allocation and assignment of all such frequencies. We expect to initiate a proceeding in the near future proposing such a plan. We note that the NTIA Spectrum Reallocation Report identified the frequency bands 139 - 140.5 MHz and 141.5 - 143 Mhz for reallocation of this spectrum in January 2008. Comments filed in the current proceeding will be taken into account in developing the Commission's plan for reallocation and assignment of this spectrum.

[499] *NPSTC Petition* at 4.

[500] *NPSTC Petition* at 4; *Spectrum Reallocation Report: Response to Title III of the Balanced Budget Act of 1997* (*NTIA Spectrum Reallocation Report*), U. S. Department of Commerce, National Telecommunications and Information Administration Special Publication 98-36 (February 1998).

[501] *NPSTC Petition* at 3.

[502] *PSWAC Final Report* at 52.

technical requirements could allow many users to operate on these channels by programming or retuning their own radios. Other users could operate on this band by purchasing small, lightweight, inexpensive[503] radios that might be snapped on a belt or carried in a pocket. Comments in reply to the *Second Notice* rarely addressed our proposal for requiring interoperability radios, and those comments did not address communicating through interoperability channels located in the 138-144 MHz band. We seek comment on the need to establish an interoperability band below 512 MHz as suggested by the *PSWAC Final Report* and supported by comments.[504] We are particularly interested in comment regarding the establishment of an interoperability band in the 138-144 MHz band. We also seek comment on the practicality of providers of public safety services acquiring small, inexpensive radios that are capable of communicating in the 138-144 MHz frequency band.[505]

3. Interoperability Channels from the VHF Maritime Band

194. The Commission's *Maritime Third Report and Order* designated two contiguous 25 kHz channel pairs in the VHF (156-162 MHz) maritime band in the VHF Public Coast Station areas (VPCs) that are not near major waterways, a region stretching from the western Great Plains to eastern California and Oregon, exclusively for public safety users.[506] Channel 25 (157.250/161.850 MHz) was set aside for public safety use throughout the region, but, due to incumbent licensees (whose operations were grandfathered and continue to be protected), no contiguous channel pair was equally available.[507] Accordingly, in some parts of the region the public safety set-aside consists of Channels 25 and 84 (157.225/161.825 MHz), and in the other areas it consists of Channels 25 and 85 (157.275/161.875 MHz).[508] The *Third R&O* did not decide the intended use, method of allocation, or standards for licensing of these frequencies.[509] We propose to license these channels under Part 90 and utilize them for interoperability in the selected 33 VPCs to assist the short term need for interoperability. Unfortunately, this will not alleviate the greatest need for spectrum, which occurs in the largest cities in the United States. We did not raise this issue in *the Second Notice* since the *Maritime Third Report and Order* was not completed at that time, and thus, have not yet asked for comment on this proposal.

195. One of the concerns we have is that public safety channels are usually allowed under Part 90 to have maximum effective radiated power of 1000 watts. The public coast stations which utilize these channels are limited to a transmitter output power of 50 watts.[510] Ideally, we would prefer to allow the public safety stations to use the same facilities and standards that we adopted for the 700 MHz band and other Part 90 land

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[503] Approximately $100-200 dollars.

[504] *NPSTC Petition* at 2, 6; *PSWAC Final Report* at 21; NPSTC Comments at 8-9, Appendix A (proposing interoperability channel allocation plan for bands below 512 MHz); California Reply at 3; IACP Comments at 3-5; FLEWUG Comments at 8.

[505] We note that the comments received on this matter will be analyzed in the context of a future proceeding regarding the allocation of 138-144 MHz band.

[506] *See Maritime Third Report and Order* at Appendix C, D, and E.

[507] *Maritime Third Report and Order* at para. 18.

[508] *Maritime Third Report and Order* at Appendix E.

[509] *Maritime Third Report and Order* at para. 31.

[510] 47 C.F.R. § 80.215(c)(1).

mobile systems. However, the public coast channels may not only be used by coast stations but are shared with users under Part 90 that were licensed pursuant to Section 90.283.[511] All of these users are limited to transmitter power of 50 watts.[512] Therefore, we propose that public safety licensees also use these channels in accordance with the rules, standards, and procedures formerly found in Section 90.283 and be subject to coordination of their stations with Canada and Mexico in the same manner as the public coast stations. We seek comment on establishing these channels and standards for public safety interoperability use and its affect on the Act. See Appendix F for the proposed rules, definitions, and locations of the 33 economic areas.

C. GLOBAL ORBITING NAVIGATION SATELLITE SYSTEM (GLONASS) AND GLOBAL POSITIONING SYSTEM (GPS)

196. The *Second Notice* sought comment on the potential for interference to GLONASS[513] and GPS[514] satellites from public safety systems operating in the 794-806 MHz band (TV channels 68-69).[515] Specifically, we sought comment on the effects of second harmonic transmissions[516] to GPS and GLONASS receivers, and the potential impact of additional requirements to public safety systems in the newly reallocated 746-806 MHz band. Aeronautical interests, specifically the Federal Aviation Administration (FAA) and U.S. Department of Transportation (USDOT) express concern about this issue and strongly encourage the Commission to set strict technical standards to protect the sensitive nature of these systems.[517] NTIA also recommends that stringent standards to ensure that public safety equipment does not cause radio frequency interference to the Global Navigation Satellite System (GNSS)[518] when used for precision approach and

[511] *See* former 47 C.F.R § 90.283 (removed by the *Maritime Third Report and Order* at Appendix F).

[512] *See* former 47 C.F.R. § 90.283(c) (1997) (limiting transmitter power of part 90 users sharing VHF public coast spectrum to 50 watts).

[513] GLONASS is the Russian Federation Global Orbiting Navigation Satellite System which will use the 1598-1605 MHz portion of the Radionavigation-Satellite Service (space-to-Earth) allocation at 1559-1610 MHz, when the GLONASS system reaches its final frequency configuration after 2005.

[514] GPS (Global Positioning System) is also in operation, and it will be the United States component of the Global Navigation Satellite System (GNSS). GPS utilizes the lower portion of the Radionavigation-Satellite Service (space-to-Earth) allocation from 1559-1610 MHz on a primary basis, and is maintained by the United States Department of Defense.

[515] *See Second Notice*, 12 FCC Rcd at 17,778-17,779.

[516] Radio transmitters produce energy not only on the desired frequency (such as 794 MHz) but also lesser amounts of energy on multiples of the desired frequency, known as harmonics. In this example, the second harmonic (twice the desired frequency) would be 1588 MHz, and the third harmonic (three times the desired frequency) would be 2382 MHz. Although most of the power generated is on the desired frequency, very sensitive receivers can detect the smaller amounts of power generated on the harmonic frequencies.

[517] *See* FAA Comments at 1; USDOT Comments at 1.

[518] GNSS as currently envisioned will consist of the GPS and GLONASS systems that provide radionavigation satellite services worldwide.

landing.[519] The public safety community, however, questions whether the reductions in the out-of-band emissions cited by the aeronautical community can practically be achieved, and asserts that the recommended standards would have a severe negative impact on public safety use of the 794-806 MHz band (TV Channels 68 and 69).[520] We recognize that this issue is of critical importance to both navigation and public safety interests and therefore we desire to obtain as complete a record as possible before making a decision. We believe that additional information is needed before we arrive at a final decision with respect to this matter. We are particularly concerned with the impact of imposing the stringent standards recommended by the commenters on the design of public safety equipment so as to make the 700 MHz band impractical for public safety use.

197. NTIA advocates that out-of-band emissions limits for GNSS be limited to -70 dBW/MHz for wideband emissions and -80 dBW/700 Hz for narrowband emissions at the transmitter based on an assumed separation distance of 30 meters (100 feet) from the GPS or GLONASS receiver for spurious or harmonic signals in the 1559-1605 MHz band.[521] These levels are consistent with levels recommended by the FAA.[522] These limits are based on international recommendations by RTCA and ETSI for mobile earth terminals in the Mobile Satellite Service (MSS).[523] The USDOT expresses its concerns regarding interference from certain portions of the 746-806 MHz band (TV Channels 60-69) to GPS and GLONASS.[524] The U.S. GPS Industry Council (Council)[525] echoes the concerns of the FAA and USDOT and advises that the GPS system is a critical component of many public safety services such as maritime operation in harbors and coastal waterways, police, fire and emergency rescue operations, and in widespread use by the FAA in commercial aviation.[526] The Council notes that it would indeed be ironic if a public safety wireless telecommunications caused interference to the safety applications being served by the GPS.[527]

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[519] See NTIA letter dated July 30, 1998, to Mr. Dan Phythyon, Chief, Wireless Telecommunications Bureau.

[520] NPSTC Reply Comments at 9.

[521] See letter dated September 18, 1997 from Mr. Richard Parlow, Associate Administrator of NTIA, to Mrs. Regina Keeney, Chief, International Bureau.

[522] FAA comments at 1.

[523] *See* RTCA Inc. Special Committee 159, Assessment of Radio Frequency Interference Relevant to the GNSS, Document No, RTCA/DO-235, January 27, 1997. The RTCA report contained two appendices – one was endorsed by the aviation community and the other by the MSS community. The MSS community arrived at a value that was less stringent (*i.e.*, -54 dBW/MHz) than that arrived at by the aviation community with respect to protection of GLONASS. *See also*, European Testing and Standards Institute (ETSI) standards TBR-041 and TBR-042 for Mobile Earth Terminals in the 1.6/2.4 GHz and 2.0 GHz range, respectively.

[524] USDOT Comments at 1.

[525] The U.S. GPS Industry Council is comprised of American companies which promote civil applications of the GPS.

[526] Council Comments at 2.

[527] *Id.* at 3.

198. The National Public Safety Telecommunications Council (NPSTC) questions whether the severe reductions in the out-of-band emissions for the proposed equipment needed to protect GPS systems can practically be achieved by the manufacturers.[528] NPSTC asserts that the radios could become more costly, heavier, and larger than desired for public safety use. NPSTC suggests that one solution is to remove the location and elevation errors feature (the selective availability feature) from GPS receivers and to require aircraft to use GPS rather than GLONASS when operating within U.S. boundaries since the GPS is more impervious to interference than GLONASS.[529] APCO argues that the FAA's proposed levels are unnecessary and may be unattainable by land mobile radio equipment manufacturers.[530] Motorola states that only a small portion of the 24 megahertz of public safety spectrum is impacted by this issue and does not see a need to impose onerous, spurious attenuation requirements on public safety equipment that pose no interference risk to GLONASS or GPS, or delay deployment of systems operating in the band.[531]

199. The Commission is committed to ensuring that the GNSS is protected adequately against interference. We observe that the GNSS will be used for radionavigation and safety applications. Based on the record before us at this time, we propose to adopt the emissions limits requested by NTIA. We agree with Motorola, however, that it is imperative that all parties fully understand the need and ramifications of this standard on use of the 700 MHz band for public safety.[532] Therefore, we request comment on the validity of the assumptions that underlie the standard recommended by NTIA to protect GNSS operations. We note that the focus of our discussion herein is the future configuration of the GLONASS (1598-1605 MHz), as part of the GNSS to be deployed worldwide after 2005.[533] We invite comment as to whether the assumed separation distance of 30 meters is appropriate for public safety mobile operations. We also invite comment as to whether extenuating conditions such as low antenna height, propagation losses, body suppression of signals, and wall attenuation, should be taken into account in calculating the out-of-band emission requirements. In addition, we are interested in obtaining a better understanding of the levels of radio energy that currently exist in the GNSS spectrum as a result of spurious emissions from other communications systems and electronic equipment. This information will enable us to determine whether stringent limits for public safety equipment are necessary and likely to be effective in accomplishing the desired objective. We note that the standard recommended by NTIA is necessary only to protect the GNSS band at 1559-1605 MHz. We propose to apply the recommended standard to that portion of the public safety spectrum (*i.e.*, 794-806 MHz) which could cause second harmonics emissions in the GNSS band. Outside the 1559-1605 MHz GNSS band, our traditional standard (*i.e.*, generally 43 + 10 log P) would apply.[534]

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[528] NPSTC Reply Comments at 9.

[529] *Id.* at 10.

[530] APCO Reply Comments at 15.

[531] Motorola Comments at 9.

[532] *Id.*

[533] The GPS currently operates at 1563.42-1587.42 MHz and thus would be affected by second harmonic emissions in the 776-794 MHz band (TV Channel 65-67). Since our concern herein is with the public safety , GPS will not be impacted by public safety systems operating in 794-806 MHz (TV Channels 68-69) portion of the band .

[534] *See* 47 C.F.R. § 90.210.

200. We observe that, under the 700 MHz band plan we adopt in the *First Report*, the proposed standard would primarily affect mobile equipment and not base stations and control stations. Mobile equipment will operate in the 794-806 MHz band and the second harmonic of this equipment will fall within the GNSS spectrum. Base stations will operate in the 764-776 MHz band and the second harmonic of this equipment will fall below the 1559 -1605 MHz band used for GNSS.[535] Our current rules typically require full power mobile units to suppress out-of-band emissions to be approximately 60 dB below the carrier; handhelds and portables generally require 50 dB suppression.[536] The standard recommended by NTIA and the FAA would require approximately 85-90 dB suppression for full-power mobile equipment and approximately 75-80 dB for handhelds and portables.[537] (See Appendix G for technical analysis.) We are very much concerned about whether the proposed emissions standard would severely curtail the availability of the 24 megahertz of spectrum designated by Congress for public safety use. Specifically, we request factual data and technical information as to the impact this proposal may have on the use of the 700 MHz band for public safety purposes. We also seek information on how the proposal may affect the equipment cost, size, weight and battery life of handheld or portable equipment. We are aware that Global Mobile Personal Communications via Satellite (GMPCS) terminals have been proposed to meet the same standard we have proposed herein.[538] We invite comment as to whether it is feasible for public safety mobile equipment to meet the same standards as commercial mobile satellite systems. We solicit suggestions as to any and all alternative approaches or measures that the Commission can take to alleviate the impact of the proposed standard. For example, we invite comment as to whether there may be a way to restrict mobile use near airports. We seek comment on whether a transition plan to more stringent levels would be appropriate to protect the future GNSS.

201. We note that Motorola suggests that we form a "technical committee" so that all interested parties can debate the problems associated with operation of public safety services in the 700 MHz band while still providing adequate protection to the GPS and GLONASS systems.[539] The Commission tentatively concludes, however, that the most timely approach for resolution of this issue is to expand the record concerning harmonic emission interference to GNSS from public safety stations. Longer term solutions might well be considered at a future date.

D. PREPARATION OF COMPUTERS TO ACCOMMODATE YEAR 2000

[535] *See* paras. 30-32, *supra.*

[536] The present rules require out of band emission to be 35 dB down from the carrier for signals removed from the carrier by more that 150 percent but not more than 250 percent. For frequencies removed more than 250 percent, the value is 43 + 10 log P (dB), where P is the output power. This gives value of 73 dB down for base stations, 57.8 dB for 30 watt mobiles, and 47.8 dB for 3 watt mobiles. *See* 47 C.F.R. § 90.210.

[537] Wideband transmissions in the context of mobile satellite and television broadcast typically refers to megahertz range, not the 150 kHz public safety systems referred herein as "wideband" transmissions. Thus, for the purposes of the GLONASS standard, we have assumed the narrowband limit of -80 dBW/700Hz as sufficient for public safety bandwidths of up to 150 kHz.

[538] In accordance with Section 25.213 (b), 47 C.F.R. § 25.213 (b), MSS equipment operating in 1610-1626.5 MHz is required to meet essentially these levels within the band 1574.397 - 1576.443 MHz. Additional proposals have been made by NTIA.

[539] Motorola Reply Comments at 8.

202. Many of the automated and intelligent machines and systems on which public safety entities depend for their operations were not designed to take into account the date change that will occur on January 1, 2000.[540] This problem, called the Year 2000 problem, the millennium bug, or simply the Y2K problem, arises because of an old computer programming convention from the 1950s consisting of using two digits, not four, to indicate a year in program code. These codes are still in use in many computers, even in some recently built computers, and in thousands of other kinds of smart machines and components with imbedded microprocessor chips, like those that control advanced radio systems. If not repaired before the turn of the century, these machines may read the code "00" as the year 1900, or may not be able to read the code at all, and will therefore be unable to compute correctly the date change from the year 1999 to the year 2000.

203. Because it is difficult to determine all the ways in which this problem can affect computer systems or microprocessors, it is not easy to predict what will happen on January 1, 2000. Companies are still testing their systems and finding new problems. What is certain is that all sectors of the global economy, including financial markets, electrical utilities, and food distribution systems, as well as public safety service providers, depend upon reliable communications networks. And we also know that every company, every government agency, and every organization that has looked into the problem has found that it is more complicated, serious, and costly than originally estimated.[541] Significant network failures due to computer inability to recognize the Year 2000 could be calamitous. Therefore, it is critical that the U.S. telecommunications community, including all sectors of the public safety communications community, take prompt, comprehensive and effective action to address the Year 2000 problem in their organizations.

204. Government agencies cannot solve the Year 2000 problem. This is a job that individual entities must undertake on their own, and the involvement of the public safety communications community is critical to solving the problem. The Commission has little information regarding the efforts of the public safety community to address the Year 2000 problem. Therefore, in this proceeding, we seek comment on how best to ascertain the extent, reach, and effectiveness of Year 2000 compliance initiatives that have been or are being undertaken by public safety entities, so that we can better understand the nature of the Year 2000 problem and the potential risks posed to public safety communications networks.

205. Recent events have raised our concerns about the state of Y2K compliance in the public safety communications community. On June 1, 1998, the Commission sponsored a Public Safety Y2K Round Table at the Commission offices in Washington, D.C.[542] Some twenty-five representatives from the manufacturing, consulting, organizational and user sectors of the public safety communications community gathered to discuss the Y2K problem. At the Round Table, participants expressed the opinion that although police, fire and EMS service providers in big agencies or in the larger cities across the country were aware of, and had taken steps to address the problem for their agencies, awareness and compliance initiatives appeared to be lacking among the smaller or more rural agencies that make up over two-thirds of the total number of public safety agencies. On May 29, 1998, the Commission sent letters, to the Chairs of the fifty-five Regional Planning Committees. The letter asked that the Chairs provide information to the Commission on their Year 2000 compliance initiatives. To date, the Commission has received little information in response to the letters.

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[540] *See* Statement of William E. Kennard, Chairman, Federal Communications Commission, before the Committee on Commerce, Science, and Transportation of the United States Senate, on Year 2000, April 28, 1998, at 1,2 (Chairman Kennard's Y2K Senate Statement).

[541] Chairman Kennard's Y2K Senate Statement at 2.

[542] *See* Public Notice "Wireless Telecommunications Bureau to Hold a Round Table Discussion on June 1, 1998 to Address Year 2000 Computer Date Change Issues Affecting Public Safety Communications," May 26, 1998.

206. Accordingly, we conclude that it is important to increase our efforts to alert the public safety communications community to the nature and seriousness of the Year 2000 problem and to ascertain both the current state of Y2K readiness and the progress and range of compliance initiatives in that community. When we refer to compliance initiatives, we mean efforts involving Y2K component identification, testing, repair, and contingency planning dealing with public safety radio systems themselves and the other equipment or systems on which these systems are dependent. We note at least three possible ways of accomplishing this goal. We could require the Regional Planning Committees to file amendments to their 800 MHz band plans to describe the state of Y2K readiness and the nature, progress and estimated completion schedule of Y2K compliance initiatives being undertaken by licensees in their regions. Alternatively, we could require the frequency coordinators to obtain this information from the licensees for whom they have provided coordination services and either file this information themselves or ask the licensees to do so; or we could require individual licensees to file this information with the Commission.

207. We seek comment on these or other possible alternative methods of obtaining the desired information on Y2K compliance initiatives in the public safety communications community. We intend that the ultimate method employed to obtain this information do so effectively and efficiently while placing the least burden on licensees, frequency coordinators, Regional Planning Committees, or the Commission.

VI. PROCEDURAL MATTERS

208. *Ex Parte Presentations*. This *First Report and Order* and *Third Notice of Proposed Rule Making* is a permit-but-disclose notice and comment rule making proceeding. *Ex parte* presentations are permitted, provided they are disclosed as provided in Commission Rules.[543]

209. *Pleading Dates*. Pursuant to Sections 1.415 and 1.419 of the Commission's rules, 47 C.F.R. §§ 1.415, 1.419, interested parties may file comments on before [60 days after publication in the Federal Register], and reply comments on or before [90 days after publication in the Federal Register]. Comments may be filed using the Commission's Electronic Comment Filing System (ECFS) or by filing paper copies. See Electronic Filing of Documents in Rulemaking Proceedings, 63 Fed. Reg. 24,121 (1998).

210. Comments filed through the ECFS can be sent as an electronic file via the Internet to <http://www.fcc.gov/e-file/ecfs.html>. Generally, only one copy of an electronic submission must be filed. If multiple docket or rulemaking numbers appear in the caption of this proceeding, however, commenters must transmit one electronic copy of the comments to each docket or rulemaking number referenced in the caption. In completing the transmittal screen, commenters should include their full name, Postal Service mailing address, and the applicable docket or rulemaking number. Parties may also submit an electronic comment by Internet e-mail. To get filing instructions for e-mail comments, commenters should send an e-mail to ecfs@fcc.gov, and should include the following words in the body of the message, "get form <your e-mail address." A sample form and directions will be sent in reply.

211. Parties who choose to file by paper must file an original and four copies of each filing. If more than one docket or rulemaking number appear in the caption of this proceeding, commenters must submit two additional copies for each additional docket or rulemaking number. All filings must be sent to the Commission's Secretary, Magalie Roman Salas, Office of the Secretary, Federal Communications Commission, 1919 M St. N.W., Room 222, Washington, D.C. 20554.

[543] See *generally* 47 C.F.R. §§ 1.1202, 1.1203, 1.1206.

212. Parties who choose to file by paper should also submit their comments on diskette. These diskettes should be submitted to: Policy and Rules Branch, Public Safety and Private Wireless Division, Wireless Telecommunications Bureau, 2025 M Street, N.W., Washington, D.C. 20554. Such a submission should be on a 3.5 inch diskette formatted in an IBM compatible format using WordPerfect 5.1 for Windows or compatible software. The diskette should be accompanied by a cover letter and should be submitted in "read only" mode. The diskette should be clearly labelled with the commenter's name, proceeding (including the docket number in this case [Docket No. WT 96-86], type of pleading (comment or reply comment), date of submission, and the name of the electronic file on the diskette. The label should also include the following phrase "Disk Copy - Not an Original." Each diskette should contain only one party's pleadings, preferably in a single electronic file. In addition, commenters must send diskette copies to the Commission's copy contractor, International Transcription Service, Inc., 1231 20th Street, N.W., Washington, D.C. 20037.

213. *Paperwork Reduction Analysis*. This *First Report and Order* contains modified and proposed information collections, respectively. As part of its continuing effort to reduce paperwork burdens, the Commission invites the general public and the Office of Management and Budget (OMB) to take this opportunity to comment on revision to the information collections contained in the *First Report and Order*. As required by the Paperwork Reduction Act of 1995, Pub. L. No. 104-13 public comments on the information collections contained in the *First Report and Order* are due 30 days after publication of the summary of the *First Report and Order* in the Federal Register.

214. The *Third Notice of Proposed Rule Making* contains proposed information collections and as part of its continuing effort to reduce paperwork burdens, the Commission invites the general public to take this opportunity to comment on the information collections. As required by the Paperwork Reduction Act of 1995, Pub. L. No. 104-13. Public and Agency comments on the information collections contained in the *Third Notice of Proposed Rule Making* are due 60 days after publication of the summary of the *Third Notice of Proposed Rule Making* in the Federal Register.

215. Comments on the modified and proposed information collections contained in the *First Report and Order* and the *Third Notice of Proposed Rule Making*, respectively, should address: (a) whether the collection of information is necessary for the proper performance of the functions of the Commission, including whether the information shall have practical utility; (b) the accuracy of the Commission's burden estimates; (c) ways to enhance the quality, utility, and clarity of the information collected; and (d) ways to minimize the burden of the collection of information on the respondents, including the use of automated collection techniques or other forms of information technology. These comments should be submitted to Judy Boley, Federal Communications Commission, Room 234, 1919 M Street, N.W., Washington, D.C. 20554, or via the Internet to jboley@fcc.gov. Furthermore, a copy of any such comments should be submitted to Timothy Fain, OMB Desk Officer, 10236 NEOB, 725 - 17th Street, N.W., Washington, D.C. 20503 or via the Internet at fain_t@al.eop.gov.

Initial and Final Regulatory Flexibility Act Analyses

216. As required by the Regulatory Flexibility Act, See 5 U.S.C. § 604, the Commission has prepared a Final Regulatory Flexibility Analysis of the possible impact of the rule changes contained in the *First Report and Order* on small entities. The Final Regulatory Flexibility Analysis is set forth in Appendix A. In addition, as required by the Regulatory Flexibility Act, *See 5 U.S.C. § 603*, an Initial Regulatory Flexibility Analysis of the possible impact on small entities of the proposals suggested in the *Third Notice of Proposed Rule Making* is contained in Appendix B. Written public comments are requested on the Initial Regulatory Flexibility Analysis. These comments must be filed in accordance with the same filing deadlines as comments

on the rest of the Notice portion of this decision, but they must have a separate and distinct heading designating them as responses to the Initial Regulatory Flexibility Analysis. The Office of Public Affairs, Reference Operations Division, will send a copy of this *First Report and Order and Third Notice of Proposed Rule Making*, including the Initial and Final Regulatory Flexibility Analyses, to the Chief Counsel for Advocacy of the Small Business Administration.

VII. ORDERING CLAUSES

217. Authority for issuance of this *First Report and Order and Third Notice of Proposed Rule Making* is contained in Sections 4(i), 302, 303(f) and (r), 332, and 337 of the Communications Act of 1934, as amended, 47 U.S.C. §§ 154(i), 302, 303(f) and (r), 332, 337.

218. Accordingly, IT IS ORDERED that Part 90 of the Commission's Rules, 47 C.F.R. Part 90, IS AMENDED as set forth in Appendix E, effective 60 days after publication of this Order in the Federal Register.

219. IT IS FURTHER ORDERED that the Wireless Telecommunications Bureau shall take all necessary steps, pursuant to the Federal Advisory Committee Act, 5 U.S.C., App., to establish a Public Safety National Coordination Committee, and charge the Committee with the duty, among others to be set forth in the Committee Charter, with recommending a national interoperability operational plan for review and approval by the Commission as well as the technical standards in accordance with American National Standards Institute process to apply to all public safety interoperability channel equipment.

220. NOTICE IS HEREBY GIVEN and COMMENT IS SOUGHT on the proposed regulatory changes described in the *Third Notice of Proposed Rule Making*,as set forth in Appendix F.

221. IT IS FURTHER ORDERED that the Commission's Office of Public Affairs, Reference Operations Division, SHALL SEND a copy of this *First Report and Order and Third Notice of Proposed Rule Making*, including the Final and Initial Regulatory Flexibility Analyses, to the Chief Counsel for Advocacy of the Small Business Administration.

222. For further information, contact Peter Daronco, Gordon Coffman or Joy Alford of the Wireless Telecommunications Bureau, Public Safety and Private Wireless Division, at (202) 418-0680 or via E-mail at "ten4fcc@fcc.gov".

FEDERAL COMMUNICATIONS COMMISSION

Magalie Roman Salas
Secretary

APPENDIX A

FINAL REGULATORY FLEXIBILITY ANALYSIS
First Report and Order

As required by the Regulatory Flexibility Act, *See* 5 U.S.C. § 603 (RFA), Initial Regulatory Flexibility Analyses (IRFA) were incorporated in the *Notice of Proposed Rule Making (Public Safety Notice)* and the *Second Notice of Proposed Rule Making (Second Notice)* in WT Docket 96-86.[544] The Commission sought written public comments on the proposals in the *Public Safety Notice* and *Second Notice*, including on the IRFAs. The Commission's Final Regulatory Flexibility Analysis (FRFA) conforms to the RFA, as amended by the Contract With America Advancement Act of 1996.[545]

1. Need For and Objective of the Rules

1. Our objective is to establish a band plan and adopt service rules for 24 megahertz of spectrum in the 746-776 MHz and 794-806 MHz bands ("700 MHz band"). The spectrum, which previously has been allocated for use by television (TV) broadcasting on TV Channels 60-69, is now being made available to meet various public safety communications needs in accordance with 47 U.S.C. § 337. Additionally, with these rules, we designate 2.6 megahertz of spectrum in the 700 MHz band for interoperability purposes. This will enable different agencies to communicate across jurisdictions and with each other. With these rules, we also adopt certain technical specifications that enhance spectrum efficiency, promote nationwide interoperability, and minimize harmful interference.

2. We sought comments on a broad range of options to achieve these goals.[546] In the *First Report and Order* section of this combined *First Report and Order* and *Third Notice of Proposed Rule Making* (hereinafter *First Report* and *Third Notice* as applicable), we continue to progress toward our goal of developing a flexible regulatory framework designed to provide sufficient spectrum for public safety purposes and to ensure that efficient, effective telecommunications facilities and services will be available to satisfy public safety communications needs into the 21st century.[547] Our actions herein also continue the process of

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[544] The Development of Operational, Technical and Spectrum Requirements For Meeting Federal, State and Local Public Safety Agency Communication Requirements Through the Year 2010, WT Docket 96-86, *Notice of Proposed Rule Making*, 11 FCC Rcd 12,460 (1996) (*Public Safety Notice*); The Development of Operational, Technical and Spectrum Requirements For Meeting Federal, State and Local Public Safety Agency Communication Requirements Through the Year 2010 and Establishment of Rules and Requirements For Priority Access Service, WT Docket 96-86, *Second Notice of Proposed Rule Making*, 12 FCC Rcd 17,706 (1997) (*Second Notice*).

[545] *See* 5 U.S.C. § 604 Pub. L. No. 104-121, 110 Stat. 847 (1996) (CWAAA). Title II of the CWAAA is "The Small Business Regulatory Enforcement Fairness Act of 1996" (SBREFA).

[546] The *Second Notice* contained a section, prompted by a Petition for Rule Making filed by the National Communications System (NCS), seeking comment on the establishment of Cellular Priority Access Service (CPAS) designed to meet the communications needs of public safety services in emergency and disaster situations. *Second Notice*, 12 FCC Rcd at 17,779-17,800. We have deferred action on this matter to a later notice.

[547] *See* Report and Plan for Meeting State and Local Government Public Safety Agency Spectrum Needs Through the Year 2010, *Report and Plan*, 10 FCC Rcd 5207 (1995) (*1995 FCC Public Safety Report*); see also Second Notice.

addressing the public safety spectrum insufficiency cited by the Public Safety Wireless Advisory Committee (PSWAC) in its *Final Report.*[548]

3. In the *First Report* herein, we establish a band plan and adopt service rules necessary to commence the process of assignment of licenses for public safety stations to operate in the newly reallocated spectrum at 746-776 MHz and 794-806 MHz (hereinafter "the 700 MHz band").[549] This new public safety spectrum allocation is the largest single allocation ever made for public safety communications and represents a significant public benefit that is derived from the upcoming evolution of television broadcasting in the United States from analog technology of the 1950s to state of the art digital technology.[550] In the 1997 Budget Act, Congress directed the Commission to commence assignment of licenses for public safety services in the 700 MHz band no later than September 30, 1998.[551] Our action herein will allow us to fulfill that mandate. Additionally, we designate a portion of the 700 MHz band for interoperability purposes, provide for national, state, and local roles in the administration and channel coordination of the new band, adopt eligibility and licensing rules, establish fundamental technical criteria such as transmitting power limits, and adopt rules to protect the service of transitional television broadcast stations from interference.

2. Summary of Significant Issues Raised by the Public Comments in Response to the Initial Regulatory Flexibility Analyses

4. In the IRFA, the Commission found that the rules we proposed to adopt in this proceeding may have a significant impact on a substantial number of small businesses. The IRFA solicited comment on alternatives to our proposed rules that would minimize the impact on small entities consistent with the objectives of this proceeding. No comments were submitted directly in response to the IRFAs. However, as described in Section V, we have taken into account the comments submitted generally by small entities.

3. Description and Estimate of the Small Entities Involved

5. The RFA directs agencies to provide a description of and, where feasible, an estimate of the number of small entities that may be affected by the proposed rules, if adopted.[552] The RFA generally defines the term "small entity" as having the same meaning as the terms "small business," "small organization," and "small governmental jurisdiction."[553] In addition, the term "small business" has the same meaning as the term "small

[548] See *Final Report of the Public Safety Wireless Advisory Committee to the Federal Communications Commission*, September 11, 1996, Key Recommendation 2.2.1, p.21.

[549] *See* ET Docket No. 97-157, *Report and Order*, 12 FCC Rcd 22,953 (1997).

[550] *See* Advanced Television Systems and Their Impact upon the Existing Television Broadcast Service, MM Docket No. 87-268, *Sixth Report and Order*, 12 FCC Rcd 14,588 (1997) (*DTV Proceeding*).

[551] *See* Balanced Budget Act of 1997, Pub. L. No. 105-33, § 3004, 111 Stat. 251 (1997) (*1997 Budget Act*), codified at 47 U.S.C. § 337(b)(1).

[552] 5 U.S.C. § 603(b)(3).

[553] *Id*. § 601(6).

business concern" under the Small Business Act.[554] 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). [555] A small organization is generally "any not-for-profit enterprise which is independently owned and operated and is not dominant in its field."[556] Nationwide, as of 1992, there were approximately 275,801 small organizations.[557] "Small governmental jurisdiction" generally means "governments of cities, counties, towns, townships, villages, school districts, or special districts, with a population of less than 50,000."[558] As of 1992, there were approximately 85,006 such jurisdictions in the United States.[559] This number includes 38,978 counties, cities, and towns; of these, 37,566, or 96 percent, have populations of fewer than 50,000.[560] The Census Bureau estimates that this ratio is approximately accurate for all governmental entities. Thus, of the 85,006 governmental entities, we estimate that 81,600 (91 percent) are small entities. Below, we further describe and estimate the number of small entity licensees and regulatees that may be affected by the proposed rules, if adopted.

6. *Public Safety Radio Pool Licensees*. As a general matter, Public Safety Radio Pool licensees include police, fire, local government, forestry conservation, highway maintenance, and emergency medical services.[561] Spectrum in the 700 MHz band for public safety services is governed by 47 U.S.C. § 337. Non-Federal governmental entities as well as private businesses are licensees for these services. As indicated *supra*

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[554] 5 U.S.C. § 601(3) (incorporating by reference the definition of "small business concern" in 15 U.S.C. § 632). Pursuant to the RFA, 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).

[555] Small Business Act, 15 U.S.C. § 632 (1996).

[556] 5 U.S.C. § 601(4).

[557] 1992 Economic Census, U.S. Bureau of the Census, Table 6 (special tabulation of data under contract to Office of Advocacy of the U.S. Small Business Administration).

[558] 5 U.S.C. § 601(5).

[559] U.S. Dept. of Commerce, Bureau of the Census, "1992 Census of Governments."

[560] *Id.*

[561] *See* Subparts A and B of Part 90 of the Commission's Rules, 47 C.F.R. §§ 90.1 - 90.22. Police licensees include 26,608 licensees that serve state, county, and municipal enforcement through telephony (voice), telegraphy (code) and teletype and facsimile (printed material). Fire licensees include 22,677 licensees comprised of private volunteer or professional fire companies as well as units under governmental control. Public Safety Radio Pool licensees also include 40,512 licensees that are state, county, or municipal entities that use radio for official purposes. There are also 7,325 forestry service licensees comprised of licensees from state departments of conservation and private forest organizations who set up communications networks among fire lookout towers and ground crews. The 9,480 state and local governments are highway maintenance licensees that provide emergency and routine communications to aid other public safety services to keep main roads safe for vehicular traffic. Emergency medical licensees (1,460) use these channels for emergency medical service communications related to the delivery of emergency medical treatment. Another 19,478 licensees include medical services, rescue organizations, veterinarians, handicapped persons, disaster relief organizations, school buses, beach patrols, establishments in isolated areas, communications standby facilities, and emergency repair of public communications facilities.

in para. 5 of this FRFA, all governmental entities with populations of less than 50,000 fall within the definition of a small entity.[562]

7. *Radio and Television Equipment Manufacturers*. We anticipate that at least six radio equipment manufacturers will be affected by our decisions in this proceeding. According to the SBA's regulations, a radio and television broadcasting and communications equipment manufacturer must have 750 or fewer employees in order to qualify as a small business concern.[563] Census Bureau data indicate that there are 858 U.S. firms that manufacture radio and television broadcasting and communications equipment, and that 778 of these firms have fewer than 750 employees and would therefore be classified as small entities.[564] We do not have information that indicates how many of the six radio equipment manufacturers associated with this proceeding are among these 778 firms. However, Motorola and Ericsson are major, nationwide radio equipment manufacturers, and, thus, we conclude that these manufacturers would *not* qualify as small businesses.

8. *Television Stations*. This *First Report* will affect full service TV station licensees (Channels 60-69), TV translator facilities, and low power TV (LPTV) stations. The Small Business Administration defines a TV broadcasting station that has no more than $10.5 million in annual receipts as a small business.[565] TV broadcasting stations consist of establishments primarily engaged in broadcasting visual programs by TV to the public, except cable and other pay TV services.[566] Included in this industry are commercial, religious, educational, and other TV stations.[567] Also included are establishments primarily engaged in TV broadcasting and which produce taped TV program materials.[568] Separate establishments primarily engaged in producing taped TV program materials are classified under another SIC number.[569]

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[562] 5 U.S.C. § 601(5).

[563] 13 C.F.R. § 121.201, (SIC) Code 3663.

[564] U.S. Dept. of Commerce, *1992 Census of Transportation, Communications and Utilities* (issued May 1995), SIC category 3663.

[565] 13 C.F.R. § 121.201, Standard Industrial Code (SIC) 4833 (1996).

[566] Economics and Statistics Administration, Bureau of Census, U.S. Department of Commerce, 1992 Census of Transportation, Communications and Utilities, Establishment and Firm Size, Series UC92-S-1, Appendix A-9 (1995) (ESA 1992 Census).

[567] *See* Executive Office of the President, Office of Management and Budget, Standard Industrial Classification Manual (1987), at 283, which describes TV Broadcasting Station (SIC Code 4833) as:

> Establishments primarily engaged in broadcasting visual programs by television to the public, except cable and other pay television services. Included in this industry are commercial, religious, educational and other television stations. Also included here are establishments primarily engaged in television broadcasting and which produce taped television program materials.

[568] ESA 1992 Census at Appendix A-9.

[569] ESA 1992 Census at Appendix A-9; SIC 7812 (Motion Picture and Video Tape Production); SIC 7922 (Theatrical Producers and Miscellaneous Theatrical Services (producers of live radio and TV programs).

9. There were 1,509 TV stations operating in the Nation in 1992.[570] That number has remained fairly constant as indicated by the approximately 1,551 operating TV broadcasting stations in the Nation as of February 28, 1997.[571] For 1992[572] the number of TV stations that produced less than $10.0 million in revenue was 1,155 establishments, or approximately 77 percent of the 1,509 establishments.[573] There are currently 95 full service analog TV stations, either operating or with approved construction permits on channels 60-69.[574] In the *DTV Proceeding*, we adopted a DTV Table which provides only 15 allotments for DTV stations on channels 60-69 in the continental United States.[575] There are seven DTV allotments in channels 60-69 outside the continental United States.[576] Thus, the rules will affect approximately 117 TV stations; approximately 90 of those stations may be considered small businesses.[577] These estimates may overstate the number of small entities since the revenue figures on which they are based do not include or aggregate revenues from non-TV affiliated companies. We recognize that the rules may also impact minority-owned and women-owned stations, some of which may be small entities. In 1995, minorities owned and controlled 37 (3.0 percent) of 1,221 commercial TV stations in the United States.[578] According to the U.S. Bureau of the Census, in 1987 women owned and controlled 27 (1.9 percent) of 1,342 commercial and non-commercial TV stations in the United States.[579]

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[570] *Allocation Report and Order*, 12 FCC Rcd at 22,953 (1998), at Appendix C; and ESA 1992 Census at Appendix A-9.

[571] *Allocation Report and Order*, 12 FCC Rcd 22,953 (1998) at Appendix C.

[572] A census for communications establishments is performed every five years ending with a ``2" or ``7." *See* ESA 1992 Census at III.

[573] The amount of $10 million was used to estimate the number of small business establishments because the relevant Census categories stopped at $9,999,999 and began at $10,000,000. No category for $10.5 million existed. Thus, the number is as accurate as it is possible to calculate with the available information.

[574] *See Allocation Notice*, 12 FCC Rcd at 14,142.

[575] *See DTV Proceeding*, 12 FCC Rcd 14,588.

[576] *See Allocation Notice* 12 FCC Rcd 14,142, n.5.

[577] We use the 77 percent figure of TV stations operating at less than $10 million for 1992 and apply it to the 117 TV stations to arrive at 90 stations categorized as small businesses.

[578] *Minority Commercial Broadcast Ownership in the United States*, U.S. Dep't of Commerce, National Telecommunications and Information Administration, The Minority Telecommunications Development Program (``MTDP") (Apr. 1996). MTDP considers minority ownership as ownership of more than 50 percent of a broadcast corporation's stock, voting control in a broadcast partnership, or ownership of a broadcasting property as an individual proprietor. The minority groups included in this report are Black, Hispanic, Asian, and Native American.

[579] *See* Comments of American Women in Radio and TV, Inc. in MM Docket No. 94-149 and MM Docket No. 91-140, at 4 n.4 (filed May 17, 1995), *citing* 1987 Economic Censuses, *Women-Owned Business*, WB87-1, U.S. Dep't of Commerce, Bureau of the Census, August 1990 (based on 1987 Census). After the 1987 Census report, the Census Bureau did not provide data by particular communications services (four-digit SIC Code), but rather by the general two-digit SIC Code for communications (#48). Consequently, since 1987, the Census Bureau has not updated data on ownership of broadcast facilities by women, nor does the Commission collect such data. However, we sought comment on whether the Annual Ownership Report Form 323 should be amended to include information on the gender and race

10. There are currently 4,977 TV translator stations and 1,952 LPTV stations.[580] Approximately 1,309 low power TV and TV translator stations are on channels 60-69[581] which could be affected by policies in this proceeding. The Commission does not collect financial information of any broadcast facility and the Department of Commerce does not collect financial information on these broadcast facilities. We will assume for present purposes, however, that most of these broadcast facilities, including LPTV stations, could be classified as small businesses. As indicated earlier, approximately 77 percent of TV stations are designated under this analysis as potentially small businesses. Given this, LPTV and TV translator stations would not likely have revenues that exceed the SBA maximum to be designated as small businesses.

4. Summary of the Projected Reporting, Recordkeeping, and Other Compliance Requirements

11. The *First Report and Order* adopts a number of rules that will entail reporting, recordkeeping, and/or third party consultation. However, the Commission believes that these requirements are the minimum needed. The *First Report and Order* establishes a 700 MHz band plan, and establishes and requires planning committees to develop and submit to the Commission organizational and operational plans for the use of this spectrum. Accordingly, this *First Report and Order* imposes recordkeeping and reporting requirements on individuals or organizations involved in establishing the national and regional planning processes including the nationwide interoperability plan, and on individuals and organizations that assist us in developing technical standards, and on entities such as applicants and licensees, that are subject to these plans, including small government agencies who may request extended implementation.

12. Additionally, in accordance with 47 U.S.C. § 337(f)(1)(B)(ii), nongovernmental organizations (NGO) are required to submit, along with their request to operate in the 700 MHz band, a written statement by the authorizing state or local government entity supporting the NGO's application.

5. Steps Taken by Agency to Minimize Significant Economic Impact on Small Entities and Significant Alternatives Considered

13. We have reduced economic burdens wherever possible. The regulatory burdens we have retained, such as filing applications on appropriate forms, are necessary in order to ensure that the public receives the benefits of innovative new services in a prompt and efficient manner.

14. We have incorporated technical rules that promote competition in the equipment market. We believe that the rules we adopt must be as competitively and technologically-neutral as possible to allow for competing equipment designs and to avoid hindering or precluding future innovative technological developments. We note that tighter technical specifications generally allow more intense spectrum use, but may result in higher equipment costs. Conversely, while wider tolerances may allow manufacturers to use less costly component parts in transmitting equipment, they may also result in less efficient spectrum use. With these considerations in mind, we believe the technical regulations we adopt herein provide a reasonable balance of these concerns.

15. Under the regional planning process, frequency coordination is now competitive. Frequency coordination is the process by which a private organization recommends to the Commission the most

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of broadcast license owners. Policies and Rules Regarding Minority and Female Ownership of Mass Media Facilities, *Notice of Proposed Rule Making*, 10 FCC Rcd 2788, 2797 (1995).

[580] *See Allocation Report and Order*, 12 FCC Rcd 22,986 at Appendix C.

[581] *See Allocation Notice* at 12 FCC Rcd 14,142, n.3.

appropriate frequencies for private land mobile radio (PLMR) service applicants.[582] Frequency coordinators provide a valuable service to the Commission by eliminating common application errors, thereby improving the quality of the applications, resolving potential interference problems at the source.[583] There are currently four frequency coordinators certified to coordinate frequencies for public safety applicants.[584] We have authorized, for the general use portion of this band, each of the four currently certified frequency coordinators to coordinate public safety spectrum, whereas in the 800 MHz National Plan, coordination is limited to APCO, the sole frequency coordinator. We continue to believe that by encouraging competition among coordinators, we will promote cost-based pricing of coordination services and provide incentives for enhancing service quality.[585] Therefore, we will allow any of the certified public safety coordinators to provide coordination in the 700 MHz band.

16. To minimize any negative impact from the licensing plan we adopt for the 700 MHz band, we have offered each state and local governments the option of utilizing the existing infrastructure of the regional planning process. Of the nation's 55 public safety regional planning committees, most were designed along state boundaries.[586] There were, however, states that were divided into different regions and states in multi-state regions;[587] 700 MHz band committee memberships within each of these states will have the option to agree to be part of only one multistate region, or to form a region designated along state boundaries.

Report to Congress: The Commission will send a copy of this *First Report and Order* and *Third Notice of Proposed Rule Making,* including this FRFA, in a report to be sent to Congress pursuant to the Small Business Regulatory Enforcement Fairness Act of 1996, *See* 5 U.S.C. § 801(a)(1)(A). In addition, the Commission will send a copy of this *First Report and Order* and *Third Notice of Proposed Rule Making,* including this FRFA, to the Chief Counsel for Advocacy of the Small Business Administration. A copy of this *First Report and Order* and *Third Notice of Proposed Rule Making* and FRFA (or summaries thereof) will also be published in the *Federal Register. See* 5 U.S.C. § 604(b).

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[582] *See* Frequency Coordination in the Private Land Mobile Radio Services, PR Docket No. 83-737, *Report and Order*, 103 FCC 2d 1093 (1986) (*Frequency Coordination Report and Order).*

[583] We note that in the future frequency coordinators will provide an even greater service by filing applications electronically.

[584] The coordinators are: Association of Public-Safety Communications Officials-International (APCO); International Association of Fire Chiefs, Inc. (IAFC)/International Municipal Signal Association (IMSA); Forestry Conservation Communications Association (FCCA); and American Association of State Highway and Transportation Officials (AASHTO).

[585] *Refarming Second Report and Order,* 12 FCC Rcd at 14,327.

[586] *See* Appendix D for a list of the current regions for the 800 MHz band.

[587] Portions of the following states were either in more than one region or in regions comprised of more than one state (Regional numbers are shown as follows (8)): Connecticut (8, 19), Delaware (28), Illinois (13, 54), Indiana (14, 54), Maine (19), Maryland (20), Massachusetts (19), Michigan (21, 54), New Hampshire (19), New Jersey (8, 28), New York (8, 30, 55), Pennsylvania (28, 36), Rhode Island (19), Vermont (19), Virginia (20, 42), Washington, D.C. (20), and Wisconsin (45, 54).

APPENDIX B

INITIAL REGULATORY FLEXIBILITY ANALYSIS
Third Notice of Proposed Rule Making

As required by the Regulatory Flexibility Act (RFA),[588] the Commission has prepared this present Initial Regulatory Flexibility Analysis (IRFA) of the possible significant economic impact on small entities by the policies and rules proposed in the present, *Third Notice of Proposed Rule Making (Third 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 on the *Third Notice* as provided above in the Procedural Matters section of this *First Report and Order* and *Third Notice of Proposed Rule Making*. The Commission will send a copy of the *Third Notice*, including this IRFA, to the Chief Counsel for Advocacy of the Small Business Administration. *See* 5 U.S.C. § 603(a). In addition, the *Third Notice* and IRFA (or summaries thereof) will be published in the Federal Register. *See id.*

1. Paperwork Reduction Analysis

In addition, comments on information collections contained in the *Third Notice of Proposed Rule Making* should be filed with Judy Boley, Federal Communications Commission, Room 234, 1919 M Street, N.W., Washington, D.C. 20554, or via the Internet to jboley@fcc.gov. Furthermore, a copy of any such comments should be submitted to Timothy Fain, OMB Desk Officer, 10236 NEOB, 725 - 17th Street, N.W., Washington, D.C. 20503 or via the Internet at fain_t@al.eop.gov. For additional information regarding the information collections contained herein, contact Judy Boley.

2. Ex Parte Presentations

1. This *Third Notice* is a permit-but-disclose notice and comment rule making proceeding. Ex parte presentations are permitted, provided they are disclosed as provided in Commission rules.[589]

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

2. In the *Third Notice* herein, we are continuing our evaluation of rules applicable to existing public safety spectrum allocations as well as those in the 700 MHz band. We seek comment on whether we should license a portion of the 700 MHz band to the regional planning committees, directly to each state or in some other manner. In addition, we propose technical criteria to protect satellite-based global navigation systems from interference. We also seek comment on proposals to promote interoperability on public safety channels below 512 MHz. Additionally, we seek comments related to the Year 2000 computer date change problem.

4. Legal Basis

3. The proposed action is authorized under Sections 4(i), 302, 303(f) and (r), 332, and 337 of the Communications Act of 1934, as amended, 47 U.S.C. §§ 154(i), 302, 303(f) and (r), 332, 337.

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[588] *See* 5 U.S.C. § 603. The RFA, *see* 5 U.S.C. § 601 *et. seq.*, has been amended by the Contract With America Advancement Act of 1996, Pub. L. No. 104-121, 110 Stat. 847 (1996) (CWAAA). Title II of the CWAAA is the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA).

[589] See generally Sections 1.1202, 1.1203, and 1.1206(a) of the Commission's Rules, 47 C.F.R. §§ 1.1202, 1.1203, 1.1206(a).

5. Description and Estimate of the Number of Small Entities To Which the Proposed Rules Will Apply

4. This IRFA may affect the same entities described in detail in the FRFA, *supra*. We hereby incorporate that analysis into this section.

5. *Public Safety Radio Pool Licensees.* As a general matter, Public Safety Radio Pool licensees include police, fire, local government, forestry conservation, highway maintenance, and emergency medical services.[590] Spectrum in the 700 MHz band for public safety services is governed by 47 U.S.C. § 337. Non-Federal governmental entities as well as private businesses are licensees for these services. As indicated *supra* in para. 5 of the FRFA, all governmental entities with populations of less than 50,000 fall within the definition of a small entity.[591] In addition, the term "small business" has the same meaning as the term "small business concern" under the Small Business Act.[592] 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). [593] A small organization is generally "any not-for-profit enterprise which is independently owned and operated and is not dominant in its field."[594] Nationwide, as of 1992, there were approximately 275,801 small organizations.[595] "Small governmental jurisdiction" generally means "governments of cities, counties, towns, townships, villages, school districts, or special districts, with a population of less than 50,000."[596] As of 1992, there were approximately 85,006 such jurisdictions in the

[590] *See* Subparts A and B of Part 90 of the Commission's Rules, 47 C.F.R. §§ 90.1 - 90.22. Police licensees include 26,608 licensees that serve state, county, and municipal enforcement through telephony (voice), telegraphy (code) and teletype and facsimile (printed material). Fire licensees include 22,677 licensees comprised of private volunteer or professional fire companies as well as units under governmental control. Public Safety Radio Pool licensees also include 40,512 licensees that are state, county, or municipal entities that use radio for official purposes. There are also 7,325 forestry service licensees comprised of licensees from state departments of conservation and private forest organizations who set up communications networks among fire lookout towers and ground crews. The 9,480 state and local governments are highway maintenance licensees that provide emergency and routine communications to aid other public safety services to keep main roads safe for vehicular traffic. Emergency medical licensees (1,460) use these channels for emergency medical service communications related to the delivery of emergency medical treatment. Another 19,478 licensees include medical services, rescue organizations, veterinarians, handicapped persons, disaster relief organizations, school buses, beach patrols, establishments in isolated areas, communications standby facilities, and emergency repair of public communications facilities.

[591] 5 U.S.C. § 601(5).

[592] 5 U.S.C. § 601(3) (incorporating by reference the definition of "small business concern" in 15 U.S.C. § 632). Pursuant to the RFA, 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).

[593] Small Business Act, 15 U.S.C. § 632 (1996).

[594] 5 U.S.C. § 601(4).

[595] 1992 Economic Census, U.S. Bureau of the Census, Table 6 (special tabulation of data under contract to Office of Advocacy of the U.S. Small Business Administration).

[596] 5 U.S.C. § 601(5).

United States.[597] This number includes 38,978 counties, cities, and towns; of these, 37,566, or 96 percent, have populations of fewer than 50,000.[598] The Census Bureau estimates that this ratio is approximately accurate for all governmental entities. Thus, of the 85,006 governmental entities, we estimate that 81,600 (91 percent) are small entities. Below, we further describe and estimate the number of small entity licensees and regulatees that may be affected by the proposed rules, if adopted.

6. *Radio and Television Equipment Manufacturers*. We anticipate that at least six radio equipment manufacturers will be affected by our decisions in this proceeding. According to the SBA's regulations, a radio and television broadcasting and communications equipment manufacturer must have 750 or fewer employees in order to qualify as a small business concern.[599] Census Bureau data indicate that there are 858 U.S. firms that manufacture radio and television broadcasting and communications equipment, and that 778 of these firms have fewer than 750 employees and would therefore be classified as small entities.[600] We do not have information that indicates how many of the six radio equipment manufacturers associated with this proceeding are among these 778 firms. However, Motorola and Ericsson are major, nationwide radio equipment manufacturers, and, thus, we conclude that these manufacturers would *not* qualify as small businesses.

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

7. The *Third Notice* proposes a number of rules that will entail reporting, recordkeeping, and/or third party consultation. However, the Commission believes that these requirements are the minimum needed. The *Third Notice* asks for comment on alternative licensing methods for certain portions of the 700 MHz band. The licensing methods under consideration in the Notice include the possibility of imposing recordkeeping and reporting requirements on applicants for public safety licenses who may be required to make submissions to planning committees justifying their requests for spectrum. These entities will be required to submit applications for spectrum licenses on Form 601.

7. Steps Taken To Minimize Significant Economic Impact on Small Entities, and Significant Alternatives Considered

8. We have reduced economic burdens wherever possible. This item seeks comment on whether we should license a portion of the 700 MHz band to the regional planning committees, directly to each state or in some other manner to meet public safety needs, and contains proposals to promote interoperability on public safety channels below 512 MHz. This approach will allow the public safety community to help determine better efficiencies for all licensees subject to the new service rules, which if adopted, will provide technically advanced communications capabilities, including small entities that are often unable to fund the required infrastructure to support these modern systems.

9. Recognizing the budgetary constraints that public safety entities face as a matter of course, the PSWAC Steering Committee's findings and recommendations included the following: (1) more sharing and

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[597] U.S. Dept. of Commerce, Bureau of the Census, "1992 Census of Governments."

[598] *Id.*

[599] 13 C.F.R. § 121.201, (SIC) Code 3663.

[600] U.S. Dept. of Commerce, *1992 Census of Transportation, Communications and Utilities* (issued May 1995), SIC category 3663.

joint use should be encouraged;[601] (2) broad based efforts, such as projects on the state and regional level, to coordinate and consolidate operations are critical to articulating and meeting the needs of public safety with cost effective, spectrally efficient radio systems;[602] (3) more flexible licensing policies are needed to encourage the use of the most spectrally-efficient technology to meet user defined needs;[603] and (4) the Commission should consider block allocations for public safety use.[604]

10. The PSWAC Interoperabilty Subcommittee noted that shared systems, *i.e.*, large trunked systems which provide service to many governmental entities in a specific geographical area, offer a high greater spectrum efficiency than many smaller non-trunked systems or systems trunked on fewer channels.[605] The most significant difficulty in establishing these types of shared systems, according to the *PSWAC Final Report*, is probably that they require individual agencies to surrender some autonomy in return for the efficiencies and better coverage of the larger system.[606] In addition, the funding required to develop the infrastructure necessary to support some of the newer technologies is often too great to permit small public safety agencies to participate in new, sophisticated, spectrum efficient wireless radio systems. These same agencies, however, might be able to participate in a county-wide or state-wide system. The use of shared systems in the public safety community has also been hindered by the current licensing process, according to the *PSWAC Final Report*.[607] In fact, the Commission has long encouraged public safety agencies to develop wide-area multi-agency trunked public safety radio systems.[608]

11. With these considerations in mind, the Third Notice seeks comment on whether to license a portion of the 700 MHz band to the regional planning committees, directly to each state or in some other manner to meet public safety needs.

12. To minimize any negative impact resulting from the implementation of licensing, we have offered the option of utilizing the existing infrastructure of the Public Safety Regions. The regulatory burdens we have retained, such as filing applications on appropriate forms, are necessary in order to ensure that the public receives the benefits of innovative new services in a prompt and efficient manner.

8. Federal Rules that May Duplicate, Overlap, or Conflict With the Proposed Rules

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[601] *See id.* at 3-4.

[602] *See id.* at 19 (Key Finding 2.1.7).

[603] *See id.* at 2-4.

[604] *See id.* at 22-23 (Key Recommendation 2.2.3).

[605] *PSWAC Final Report* at 317-318. Shared systems also offer a high level of built-in interoperability. *Id.*

[606] *Id.*

[607] *PSWAC Final Report* at 315.

[608] Area-wide licenses often encourage the rapid development and deployment of innovative service, facilitate interoperability and operational standards while allowing economies of scale that encourage the development of low cost equipment. *See, e.g.,* Amendment of the Commission's Rules to Establish Part 27, the Wireless Communications Service, GN Docket No. 96-228, *Report and Order*, 12 FCC Rcd 10785, 10814 (1997).

13. None.

APPENDIX C

LIST OF PLEADINGS

The following is a list of parties filing comments and reply comments in response to the *Second Notice of Proposed Rulemaking* in The Development of Operational, Technical, and Spectrum Requirements for Meeting Federal, State and Local Public Safety Agency Communication Requirements Through the Year 2010, WT Docket No. 96-86, 12 FCC Rcd 17,706 (1997). Submissions that included or exclusively addressed the issues pertaining to the Establishment of Rules and Requirements For Priority Access Service (CPAS) are preceded by an asterisk (*).

Comments

*360º Communications Company (360 Co.)
*American Petroleum Institute (API)
*American Red Cross (Red Cross)
*American Water Works Association (AWWA)
*AMSC Subsidiary Corporation (AMSC)
APCO Project 25 Steering Committee (Project 25 Committee)
Association For Maximum Service Television, Inc. and National Association of Broadcasters (AMSTV/NAB)
*Association of Public-Safety Communications Officials-International (APCO)
*Bell Atlantic Mobile, Inc. (BAM)
*BellSouth Corporation (BellSouth)
Brazos County Emergency Communications District (Brazos)
California, State of (California)
*California Public-Safety Radio Association (CA/PSRA)
*Cellular Telecommunications Industry Association (CTIA)
Compu-Dawn, Inc. (Compu-Dawn)
Department of Transportation (USDOT)
*Ericsson (Ericsson)
Federal Aviation Administration (FAA)
Federal Law Enforcement Wireless Users Group (FLEWUG)
*Florida Power and Light Company (Florida Power)
Florida, State of (Florida)
*Griffin, Frederick G. (Griffin)
*GTE Service Corporation (GTE)
International Association of Chiefs of Police (IACP)
*Joint Comments of (Joint Commenters)
- American Association of State Highway and Transportation Officials,
- Forestry Conservation Communications Association,
- International Association of Fire Chiefs, Inc.
- International Association of Fish and Wildlife Agencies,
- International Municipal Signal Association
- National Association of State Foresters

Irving, City of (Irving, TX)
*Long Beach, City of (Long Beach, CA)
M/A-COM (M/A COM)
Major Cities Police Chiefs Association (Police Chiefs)

*Motorola, Inc. (Motorola)
*National Communications System (NCS)
*National Emergency Number Association (NENA)
National League of Cities (NLC)
National Public Safety Telecommunications Council (NPSTC)
National Sheriff's Association (NSA)
National Telecommunications and Information Administration (NTIA)
*New York State Police (NYS Police)
*New York Transit Authority (NY Transit)
*Nextel Communications, Inc. (Nextel)
Pennsylvania, Commonwealth of (Pennsylvania)
*Personal Communications Industry Association (PCIA)
*Primeco Personal Communications, L.P. (Primeco)
Public Safety Communications Council (PSCC)
Region 20-Washington Metropolitan Area (Region 20)
Region 49-Austin, Texas (Region 49)
Richardson, City of (Richardson,TX)
Ridgeland, City of (Ridgeland, TX)
*Southwestern Bell Mobile Systems, Inc. (SBMS)
Szerlag, Peter W. (Szerlag)
U.S. Global Positioning System Industry Council (GPS Council)
*UTC, The Telecommunications Association (UTC)

Reply Comments

Alameda, County of (Alameda)
American Association of State Hwy & Transportation Officials (AASHTO)
*American Petroleum Institute (API)
Aspen-Pitkin County Communications Center (Aspen-Pitkin)
Association For Maximum Service Television, Inc. and National Association of Broadcasters (AMSTV/NAB)
Association of Public-Safety Communications Officials-International, Inc.(APCO)
*Bell Atlantic Mobile (BAM)
California Public Safety Radio Association (CA-PSRA)
California, State of (California)
CBS Broadcasting,Inc. (CBS)
Compu-Dawn (Compu-Dawn)
Cordillera Communications, Inc. (Cordillera)
Ericsson, Inc. (Ericsson)
Federal Law Enforcement Wireless Users Group (FLEWUG)
Fort Lauderdale, City of (Fort Lauderdale, FL)
*GTE Service Corporation (GTE)
International Association of Chiefs of Police (IACP)
Joint Reply Commenters (Joint Reply Commenters)
- American Association of State Highway and Transportation Officials,
- Forestry Conservation Communications Association,
- International Association of Fire Chiefs, Inc.,
- International Association of Fish and Wildlife Agencies,
- International Municipal Signal Association

- National Association of State Foresters
Jovon Broadcasting Corporation (Jovon B/C)
Kenwood Communications, Inc. (Kenwood)
Liberman Television, Inc. (Liberman TV)
Littlerock, City of (Littlerock)
Max Media Properties, LLC (Max Media)
Motorola (Motorola)
Mountain Broadcasting Corporation (Mountain B/C)
*National Communications Systems (NCS)
National Public Safety Telecommunications Council (NPSTC)
*Nextel Communications, Inc. (Nextel)
*Northern Telecom, Inc. (Nortel)
Personal Communications Industry Association (PCIA)
Powell, John S. (Powell)
*Primeco Personal Communications, L.P. (Primeco)
Project 25 Steering Committee (Project 25 Committee)
Region 6- Northern California Public Safety Area (Region 6)
Region 9- Florida Public Safety Area (Region 9)
Sonoma, County of (Sonoma, CA)
*Southwestern Bell Mobile Systems, Inc. and Pacific Bell Mobile Services (SBMS)
Utah Communications Agency Network (UCAN)
*UTC, The Telecommunications Association (UTC)
WRNN-TV Associates Limited Partnership, L.P (WRNN-TV)

Ex-Parte Filings

APCO
Joint Commenters: (Joint Commenters)
- American Association of State Highway and Transportation Officials,
- Forestry Conservation Communications Association,
- International Association of Fire Chiefs, Inc.
- International Association of Fish and Wildlife Agencies,
- International Municipal Signal Association
- National Association of State Foresters

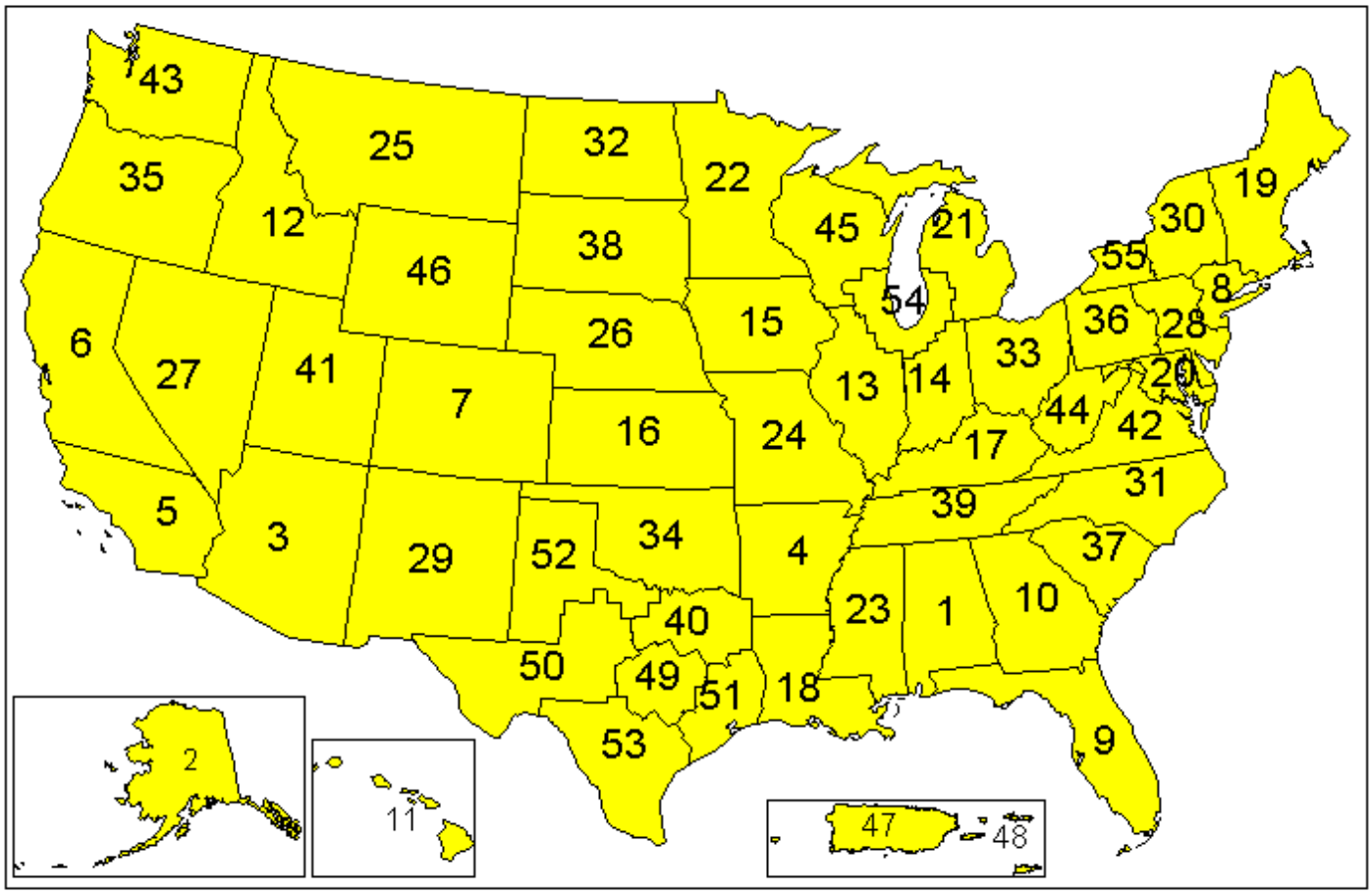
Los Angeles County Internal Services Department, Los Angeles County Sheriff's Department, and Los Angeles Board of Supervisors (LAISD, LACSD and LABOS)
Motorola
National Public Safety Telecommunications Council (NPSTC)
Joe Bruno
Federal Law Enforcement Wireless Users Group (FLEWUG)
Ericsson
Frederick G. Griffin, P.E.
Cerulean Technology, Inc.

APPENDIX D
LIST OF REGIONS

1. Alabama
2. Alaska
3. Arizona
4. Arkansas
5. California-South (to the northernmost borders of San Luis Obispo, Kern, and San Bernardino Counties).
6. California-North (that part of California not included in California-South)
7. Colorado
8. New York-Metropolitan (Fairfield County, Litchfield, New Haven, and Middlesex, Counties, Connecticut; Bronx, Kings, Nassau, New York, Orange, Putnam, Queens, Richmond, Rockland, Suffolk, Sullivan, Ulster, Dutchess, and Westchester Counties, New York; Bergen, Essex, Hudson, Morris, Passaic, Sussex, Union, Warren, Middlesex, Somerset, Hunterdon, Mercer, and Monmouth Counties, New Jersey)
9. Florida
10. Georgia
11. Hawaii
12. Idaho
13. Illinois (all except area in Region 54)
14. Indiana (all except area in Region 54)
15. Iowa
16. Kansas
17. Kentucky
18. Louisiana
19. Maine; New Hampshire; Vermont; Massachusetts; Rhode Island; Connecticut (except Fairfield, Litchfield, New Haven, and Middlesex Counties)
20. Maryland Washington, D.C. Virginia - Northern (Arlington, Fairfax, Fauquier, Loudoun, Prince William and Stafford Counties; and Alexandria, Fairfax, Falls Church, Manassas and Manassas Park Cities)
21. Michigan (all except area in Region 54)
22. Minnesota
23. Mississippi
24. Missouri
25. Montana
26. Nebraska
27. Nevada
28. New Jersey (except for counties included in the New York-Metropolitan, Region 8, above) Pennsylvania (Bucks, Chester, Montgomery, Philadelphia, Carbon, Columbia, Dauphin, Lackawanna, Lancastour, Northumberland, Pike, Schuylkill, Sullivan, Susquehanna, Tioga, Wayne, Wyoming and York Counties) Delaware
29. New Mexico
30. New York - Albany (all except area in New York - Metropolitan, Region 8, and New York - Buffalo, Region 55)
31. North Carolina
32. North Dakota
33. Ohio
34. Oklahoma
35. Oregon
36. Pennsylvania (all except area in Region 28, above)
37. South Carolina
38. South Dakota
39. Tennessee
40. Texas - Dallas (including the counties of Cooke, Grayson, Fannin, Lamar, Red River, Bowie, Wise, Denton, Collin, Hunt, Delta, Hopkins, Franklin, Titus, Morris, Cass, Tarrant, Dallas, Palo Pinto, Parker, Rockwall, Kaufman, Rains, VanZandt, Wood, Smith, Camp, Upshur, Gegg, Marion, Harrison, Panola, Rusk, Cherokee, Anderson, Henderson, Navarro, Ellis, Johnson, Hood, Somervell and Erath)
41. Utah
42 Virginia (all except area in Region 20, above)
43. Washington
44. West Virginia
45. Wisconsin (all except area in Region 54)
46. Wyoming
47. Puerto Rico
48. U.S. Virgin Islands
49. Texas - Austin (including the counties of Bosque, Hill, Hamilton, McLennan, Limestone, Freestone, Mills, Coryell, Falls, Robertson, Leon, San Saba, Llano, Burnet, Williamson, Burleson, Lee, Washington, Blanco, Hays, Travis, Caldwell, Bastrop, and Fayette)

50. Texas - El Paso (including the counties of Knox, Kent, Stonewall, Haskell, Throckmorton, Gaines, Dawson, Borden, Scurry, Fisher, Jones, Shakelford, Stephens, Andrews, Martin, Howard, Mitchell, Nolan, Taylor, Callahan, Eastland, Loving, Winkler, Ector, Midland, Glasscock, Sterling, Coke, Runnels, Coleman, Brown, Comanche, Culberson, Reeves, Ward, Crane, Upton, Reagan, Irion, Tom Green, Concho, McCulloch, Jeff Davis, Hudspeth, El Paso, Pecos, Crockett, Schleicher, Menard, Mason, Presidio, Brewster, Terrell, Sutton, and Kimble)
51. Texas - Houston (including the counties of Shelby, Nacogdoches, San Augustine, Sabine, Houston, Trinity, Angelina, Walker, San Jacinto, Polk, Tyler, Jasper, Newton, Montgomery, Liberty, Hardin, Orange, Waller, Harris, Chambers, Jefferson, Galveston, Brazoria, Fort Bend, Austin, Colorado, Wharton, and Matagorda)
52. Texas - Lubbock (including the counties of Dallam, Sherman, Hansford, Ochiltree, Lipscomb, Hartley, Moore, Hutchinson, Roberts, Hemphill, Oldham, Potter, Carson, Grey, Wheeler, Deaf Smith, Randall, Armstrong, Donley, Collingsworth, Parmer, Castro, Swisher, Briscoe, Hall, Childress, Bailey, Lamb, Hale, Floyd, Motley, Cottle, Hardeman, Foard, Wilbarger, Witchita, Clay, Montague, Jack, Young, Archer, Baylor, King, Dickens, Crosby, Lubbock, Lockley, Cochran, Yoakum, Terry, Lynn, and Garza)
53. Texas - San Antonio (including the counties of Val Verde, Edwards, Kerr, Gillespie, Real, Bandera, Kendall, Kinney, Uvalde, Medina, Bexar, Comal, Guadalupe, Bonzales, Lavaca, Dewitt, Karnes, Wilson, Atascosa, Frio, Zavala, Maverick, Dimmit, LaSalle, McMillen, Live Oak, Bee, Goliad, Victoria, Jackson, Calhoun, Refugio, Aransas, San Patricio, Nueces, Jim Wells, Duval, Webb, Klegerg, Kennedy, Brooks, Jim Hogg, Zapata, Starr, Hidalgo, Willacy, and Cameron)
54. Chicago - Metropolitan (Winnebago, McHenry, Cook, Kane, Kendall, Grundy, Boone, Lake, DuPage, DeKalb, Will, and Kankakee Counties, Illinois; Kenosha, Milwaukee, Washington, Dodge, Walworth, Jefferson, Racine, Ozaukee, Waukesha, Dane, and Rock Counties, Wisconsin; Lake, La Porte, Jasper, Starke, St. Joseph, Porter, Newton, Pulaski, Marshall and Elkart Counties, Indiana; Ottawa, Kent, Van Buren, Kalamazoo, Barry, Muskegon, Allegan, Berrien, Cass, and St. Joseph Counties, Michigan)
55. New York - Buffalo (including the counties of Niagara, Chemung, Schuyler, Seneca, Erie, Chautauqua, Cattaraugus, Allegany, Wyoming, Genesee, Orleans, Monroe, Livingston, Steuben, Ontario, Wayne, and Yates)

The Public Safety Planning Regions in the United States



APPENDIX E

FINAL RULES FOR FIRST REPORT AND ORDER

Part 2 of Chapter I of Title 47 of the Code of Federal Regulations is amended as follows:

1. The authority citation for Part 2 is revised to read as follows:

AUTHORITY: 47 U.S.C. 154, 302, 303, 307, 336, and 337, unless otherwise noted.

2. Section 2.103 is revised to read as follows:

§ 2.103 Government use of non-Government frequencies.

(a) Government stations may be authorized to use non-Government frequencies in the bands above 25 MHz (except the 764-776 MHz and 794-806 MHz public safety bands) if the Commission finds that such use is necessary for coordination of Government and non-Government activities: Provided, however, that:

(1) Government operation on non-Government frequencies shall conform with the conditions agreed upon by the Commission and the National Telecommunications and Information Administration (the more important of which are contained in paragraphs (a)(2), (a)(3) and (a)(4) of this section);

(2) Such operations shall be in accordance with Commission rules governing the service to which the frequencies involved are allocated;

(3) Such operations shall not cause harmful interference to non-Government stations and, should harmful interference result, that the interfering Government operation shall immediately terminate; and

(4) Government operation has been certified as necessary by the non-Government licensees involved and this certification has been furnished, in writing, to the Government agency with which communication is required.

(b) Government stations may be authorized to use channels in the 764-776 MHz and 794-806 MHz public safety bands with non-Government entities if the Commission finds such use necessary; where:

(1) The stations are used for interoperability or part of a Government/non-Government shared or joint-use system;

(2) The Government entity obtains the approval of the non-Government (State/local government) licensee(s) or applicant(s) involved;

(3) Government operation is in accordance with the Commission's Rules governing operation of this band and conforms with any conditions agreed upon by the Commission and the National Telecommunications and Information Administration; and

(4) Interoperability, shared or joint-use systems are the subject of a mutual agreement between the Government and non-Government entities. This section does not preclude other arrangements or agreements as permitted under Part 90 of the Rules. *See* 47 CFR §§ 90.179 and 90.421.

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

3. The authority citation for Part 90 is amended to read as follows:

AUTHORITY: Secs. 4, 251-2, 303, 309, 332 and 337, 48 Stat 1066, 1082, as amended; 47 U.S.C. 154, 251-2, 303, 309 and 337, unless otherwise noted.

4. Section 90.20 is amended by adding two entries to the table in paragraph (c)(3) and by adding a new paragraph (d)(77), to read as follows:

§ 90.20 Public Safety Pool.

* * * * *

(c) * * *

(3) * * *

PUBLIC SAFETY POOL FREQUENCY TABLE

Frequency or band	Class of station(s)	Limitations	Coordinator
* * * * *	* * * * *	* * * * *	* * * * *
764 to 776	Base, mobile	77.	PX
794 to 806	Mobile	77.	PX
* * * * *	* * * * *	* * * * *	* * * * *

(d) * * *

(77) Subpart R of this part contains rules for assignment of channels in the 764-776 MHz and 794-806 MHz bands.

* * * * *

5. Section 90.205 is amended by revising paragraph (i) to read as follows:

§ 90.205 Power and antenna height limits.

* * * * *

(i) *764-776 MHz, 794-824 MHz, 851-869 MHz, 896-901 MHz and 935-940 MHz*. Power and height limitations are specified in § 90.635.

* * * * *

6. A new Subpart R is added to read as follows:

Subpart R - Regulations Governing the Licensing and Use of Frequencies in the 764-776 and 794-806 MHz Bands

§ 90.521 Scope.

This subpart sets forth the regulations governing the licensing and operations of all systems operating in the 764-776 MHz and 794-806 MHz frequency bands. It includes eligibility, operational, planning and licensing requirements and technical standards for stations licensed in these bands. The rules in this subpart are to be read in conjunction with the applicable requirements contained elsewhere in this part; however, in case of conflict, the provisions of this subpart shall govern with respect to licensing and operation in these frequency bands.

§ 90.523 Eligibility.

This section implements the definition of public safety services contained in 47 U.S.C. § 337(f)(1). The following are eligible to hold Commission authorizations for systems operating in the 764-776 MHz and 794-806 MHz frequency bands:

(a) *State or local government entities*. Any territory, possession, state, city, county, town, or similar State or local governmental entity is eligible to hold authorizations in the 764-776 MHz and 794-806 MHz frequency bands.

(b) *Nongovernmental organizations*. A nongovernmental organization (NGO) that provides services, the sole or principal purpose of which is to protect the safety of life, health, or property, is eligible to hold an authorization for a system operating in the 764-776 MHz and 794-806 MHz frequency bands for transmission or reception of communications essential to providing such services if (and only for so long as) the NGO applicant/licensee:

(1) has the written, ongoing support (to operate such system) of a state or local governmental entity whose mission is the oversight of or provision of services, the sole or principal purpose of which is to protect the safety of life, health, or property; and

(2) operates such authorized system solely for transmission of communication essential to providing services the sole or principal purpose of which is to protect the safety of life, health, or property.

(c) *All NGO authorizations are conditional*. NGOs assume all risks associated with operating under conditional authority. Authorizations issued to NGOs to operate systems in the 764-776 MHz and 794-806 MHz frequency bands include the following condition: If at any time the supporting governmental entity (see paragraph (b)(1)) notifies the Commission in writing of such governmental entity's termination of its authorization of a NGO's operation of a system in the 764-776 MHz and 794-806 MHz frequency bands, the NGO's application shall be dismissed automatically or, if authorized by the Commission, the NGO's authorization shall terminate automatically.

(d) Paragraphs (a) and (b) notwithstanding, no entity is eligible to hold an authorization for a system operating in the 764-776 MHz and 794-806 MHz frequency bands on the basis of services, the sole or principal purpose of which is to protect the safety of life, health or property, that such entity makes commercially available to the public.

§ 90.527 Regional plan requirements.

Each regional planning committee must submit a regional plan for approval by the Commission.

(a) *Common elements*. Regional plans must incorporate the following common elements:

(1) Identification of the document as the regional plan for the defined region with the names, business addresses, business telephone numbers, and organizational affiliations of the chairpersons 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) A general description of how the spectrum would be allotted among the various eligible users within the region with an explanation of how the requirements of all eligible entities within the region were considered and, to the degree possible, met.

(4) An explanation as to how needs were assigned priorities in areas where not all eligible entities could receive licenses.

(5) An explanation of how the plan had been coordinated with adjacent regions.

(6) A detailed description of how the plan put the spectrum to the best possible use by requiring system design with minimum coverage areas, by assigning frequencies so that maximum frequency reuse and offset channel use may be made, by using trunking, and by requiring small entities with minimal requirements to join together in using a single system where possible.

(7) A detailed description of the future planning process, including, but not limited to, amendment process, meeting announcements, data base maintenance, and dispute resolution.

(8) A certification by the regional planning chairperson that all planning committee meetings, including subcommittee or executive committee meetings, were open to the public.

(b) *Modification of Regional Plans*. Regional plans may be modified by submitting a written request, signed by the regional planning committee, to the Chief, Wireless Telecommunications Bureau. The request must contain the full text of the modification, and must certify that successful coordination of the modification with all adjacent regions has occurred and that all such regions concur with the modification.

§ 90.531 Band plan.

This section sets forth the band plan for the 764-776 MHz and 794-806 MHz public safety bands.

(a) *Base and mobile use.* The 764-776 MHz band may be used for base, mobile or fixed (repeater) transmissions. The 794-806 MHz band may be used only for mobile or fixed (control) transmissions.

(b) *Narrowband segments.* There are four band segments that are designated for use with narrowband emissions. Each of these narrowband segments is divided into 480 channels having a channel size of 6.25 kHz as follows:

Frequency Range	Channel Numbers
764 - 767 MHz	1 - 480
773 - 776 MHz	481 - 960
794 - 797 MHz	961 - 1440
803 - 806 MHz	1441 - 1920

(1) *Narrowband nationwide interoperability channels*. The following narrowband channels are designated for nationwide interoperability licensing and use: 55, 56, 59, 60, 67, 68, 135, 136, 139, 140, 147, 148, 215, 216, 219, 220, 227, 228, 295, 296, 299, 300, 307, 308, 375, 376, 379, 380, 387, 388, 467, 468, 535, 536, 539, 540, 547, 548, 615, 616, 619, 620, 627, 628, 695, 696, 699, 700, 707, 708, 775, 776, 779, 780, 787, 788, 855, 856, 859, 860, 867, 868, 947, 948, 1015, 1016, 1019, 1020, 1027, 1028, 1095, 1096, 1099, 1100, 1107, 1108, 1175, 1176, 1179, 1180, 1187, 1188, 1255, 1256, 1259, 1260, 1267, 1268, 1335, 1336, 1339, 1340, 1347, 1348, 1427, 1428, 1495, 1496, 1499, 1500, 1507, 1508, 1575, 1576, 1579, 1580, 1587, 1588, 1655, 1656, 1659, 1660, 1667, 1668, 1735, 1736, 1739, 1740, 1747, 1748, 1815, 1816, 1819, 1820, 1827, 1828, 1907, 1908.

(2) *Reserved narrowband channels.* The following narrowband channels are reserved pending further Commission action in WT Docket No. 96-86 (*proceeding pending*): 53, 54, 57, 58, 61-66, 69-80, 133, 134, 137, 138, 141-146, 149-160, 213, 214, 217, 218, 221-226, 229-240, 293, 294, 297, 298, 301-306, 309-320, 373, 374, 377, 378, 381-386, 389-400, 453-466, 469-480, 533, 534, 537, 538, 541-546, 549-560, 613, 614, 617, 618, 621-626, 629-640, 693, 694, 697, 698, 701-706, 709-720, 773, 774, 777, 778, 781-786, 789-800, 853, 854, 857, 858, 861-866, 869-880, 933-946, 949-960, 1013, 1014, 1017, 1018, 1021-1026, 1029-1040, 1093, 1094, 1097, 1098, 1101-1106, 1109-1120, 1173, 1174, 1177, 1178, 1181-1186, 1189-1200, 1253, 1254, 1257, 1258, 1261-1266, 1269-1280, 1333, 1334, 1337, 1338, 1341-1346, 1349-1360, 1413-1426, 1429-1440, 1493, 1494, 1497, 1498, 1501-1506, 1509-1520, 1573, 1574, 1577, 1578, 1581-1586, 1589-1600, 1653, 1654, 1657, 1658, 1661-1666, 1669-1680, 1733, 1734, 1737, 1738, 1741-1746, 1749-1760, 1813, 1814, 1817, 1818, 1821-1826, 1829-1840, 1893-1906, 1909-1920.

(3) *Narrowband general use channels*. All narrowband channels established in paragraph (b), other than those listed in paragraphs (b)(1) and (b)(2), are designated for exclusive assignment to public safety eligibles subject to Commission-approved regional planning committee regional plans.

(c) *Wideband segments.* There are two band segments that are designated for use with wideband emissions. Each of these wideband segments is divided into 120 channels having a channel size of 50 kHz as follows:

Frequency Range	Channel Numbers
767 - 773 MHz	1 - 120
797 - 803 MHz	121 - 240

(1) *Wideband nationwide interoperability channels*. The following wideband channels are designated for nationwide interoperability licensing and use: 7-9, 34-36, 58-63, 85-87, 112-114, 127-129, 154-156, 178-183, 205-207, 232-234.

(2) Reserved *wideband channels.* The following wideband channels are reserved pending further Commission action in WT Docket No. 96-86 (*proceeding pending*): 1-6, 37-57, 64-84, 115-126, 157-177, 184-204, 235-240.

(3) *Wideband general use channels*. All wideband channels established in paragraph (c), except for those listed in paragraphs (c)(1) and (c)(2), are designated for shared assignment to public safety eligibles subject to Commission-approved regional planning committee regional plans.

(d) *Combining channels*. At the discretion of the appropriate regional planning committee, contiguous channels may be used in combination in order to accommodate requirements for larger bandwidth emissions, in accordance with this paragraph. As an exception to this general rule, channels designated for nationwide interoperability use must not be combined with channels that are not designated for nationwide interoperability use.

(1) *Narrowband.* Two or four contiguous narrowband (6.25 kHz) channels may be used in combination as 12.5 kHz or 25 kHz channels, respectively. The lower (in frequency) channel for two channel combinations must be an odd (*i.e.* 1, 3, 5 ...) numbered channel. The lowest (in frequency) channel for four channel combinations must be a channel whose number is equal to 1+(4×n), where n = any integer between 0 and 479, inclusive (*e.g.* channel number 1, 5, ... 1917). Channel combinations are designated by the lowest and highest channel numbers separated by a hyphen, *e.g.* "1-2" for a two channel combination and "1-4" for a four channel combination.

(2) *Wideband*. Two or three contiguous wideband (50 kHz) channels may be used in combination as 100 kHz or 150 kHz channels, respectively. The lower (in frequency) channel for two channel combinations must be a channel whose number is equal to 1+(3×n) or 2+(3×n), where n = any integer between 0 and 79, inclusive (*e.g.* channel number 1, 2, 5, 6, ... 238, 239). The lowest (in frequency) channel for three channel combinations must be a channel whose number is equal to 1+(3×n), where n = any integer between 0 and 79, inclusive (*e.g.* channel number 1, 5, ... 238). Channel combinations are designated by the lowest and highest channel numbers separated by a hyphen, *e.g.* "1-2" for a two channel combination and "1-3" for a three channel combination.

(f) *Channel pairing*. In general, channels must be planned and assigned in base/mobile pairs that are separated by 30 MHz. However, until December 31, 2006, channels other than those listed in paragraphs (b)(1) and (c)(1), may be planned and assigned in base/mobile pairs having a different separation, where necessary because 30 MHz base/mobile pairing is precluded by the presence of one or more co-channel or adjacent channel TV/DTV broadcast stations.

§ 90.533 Transmitting sites near the U.S./Canada or U.S./Mexico border.

This section applies to each license to operate one or more public safety transmitters in the 764-776 MHz and 794-806 MHz bands, at a location or locations North of Line A (see § 90.7) or within 120 kilometers (75 miles) of the U.S.-Mexico border, until such time as agreements between the government of the United States and the government of Canada or the government of the United States and the government of Mexico, as applicable, become effective governing border area non-broadcast use of these bands. Public safety licenses are granted subject to the following conditions:

(a) Operation of public safety transmitters must not cause harmful interference to the reception of television broadcasts transmitted by UHF TV broadcast stations located in Canada or Mexico. In addition, public safety base, control, and mobile transmitters must comply with the interference protection criteria in Section 90.545 for TV/DTV stations in Canada and Mexico.

(b) Public safety facilities must accept any interference that may be caused by operations of UHF television broadcast transmitters in Canada and Mexico.

(c) Conditions may be added during the term of the license, if required by the terms of international agreements between the government of the United States and the government of Canada or the government of the United States and the government of Mexico, as applicable, regarding non-broadcast use of the 764-776 MHz and 794-806 MHz bands.

§ 90.535 Modulation and spectrum usage efficiency requirements.

Transmitters designed to operate in 764-776 MHz and 794-806 MHz frequency bands must meet the following modulation standards:

(a) All transmitters in the 764-776 MHz and 794-806 MHz frequency bands must use digital modulation. Mobile and portable transmitters may have analog modulation capability only as a secondary mode in addition to its primary digital mode.

(b) Transmitters designed to operate in the narrowband segment using digital modulation must be capable of maintaining an data throughput of not less than 4.8 kbps in a 6.25 kHz bandwidth.

(c) Transmitters designed to operate in the wideband segment using digital modulation must be capable of maintaining an data throughput of not less than 384 kbps in a 150 kHz bandwidth.

§ 90.537 Trunking requirement.

All systems using six or more narrowband channels in the 764-776 MHz and 794-806 MHz frequency bands must be trunked systems, except for those using the designated nationwide interoperability channels.

§ 90.539 Frequency stability.

Transmitters designed to operate in 764-776 MHz and 794-806 MHz frequency bands must meet the frequency stability requirements in this section.

(a) Mobile, portable and control transmitters must normally use automatic frequency control (AFC) to lock on to the base station signal.

(b) The frequency stability of base transmitters operating in the narrowband segment must be 100 parts per billion or better.

(c) The frequency stability of mobile, portable and control transmitters operating in the narrowband segment must be 400 parts per billion or better when AFC is locked to a base station, and 2.5 parts per million or better when AFC is not locked.

(d) The frequency stability of base transmitters operating in the wideband segment must be 1 part per million or better.

(e) The frequency stability of mobile, portable and control transmitters operating in the wideband segment must be 1.25 parts per million or better when AFC is locked to a base station, and 5 parts per million or better when AFC is not locked.

§ 90.541 Transmitting power limits.

The transmitting power of base, mobile, portable and control stations operating in the 764-776 MHz and 794-806 MHz frequency bands must not exceed the maximum limits in this section, and must also comply with any applicable effective radiated power limits in § 90.545.

(a) The transmitting power of base transmitters must not exceed the limits given in paragraphs (a), (b) and (c) of § 90.635.

(b) The transmitter output power of mobile and control transmitters must not exceed 30 Watts.

(c) The transmitter output power of portable (hand-held) transmitters must not exceed 3 Watts.

(d) Mobile and portable transmitters must be designed to employ automatic power control.

§ 90.543 Emission limitations.

Transmitters designed to operate in 764-776 MHz and 794-806 MHz frequency bands must meet the emission limitations in this section.

(a) The adjacent channel coupled power (ACCP) requirements for transmitters designed for various channel sizes are shown in the following tables. Mobile station requirements apply to handheld, car mounted and control station units. The tables specify a maximum value for the ACCP relative to maximum output power as a function of the displacement from the channel center frequency. In addition, the ACCP for a mobile station transmitter at the specified frequency displacement must not exceed the value shown in the tables. For transmitters that have power control, the latter ACCP requirement can be met at maximum power reduction. In the following charts, "(s)" means a swept measurement is to be used.

6.25 kHz Mobile Transmitter ACCP Requirements

Offset from Center Frequency (kHz)	Measurement Bandwidth (kHz)	Maximum ACCP Relative (dBc)	Maximum ACCP Absolute (dBm)
6.25	6.25	-40	not specified
12.5	6.25	-60	-45
18.75	6.25	-60	-45
25	6.25	-65	-50
37.5	25	-65	-50
62.5	25	-65	-50
87.5	25	-65	-50
150	100	-65	-50
250	100	-65	-50
>400 to receive band	30 (s)	-75	-55
in the receive band	30 (s)	-100	-70

12.5 kHz Mobile Transmitter ACCP Requirements

Offset from Center Frequency (kHz)	Measurement Bandwidth (kHz)	Maximum ACCP Relative (dBc)	Maximum ACCP Absolute (dBm)
9.375	6.25	-40	not specified
15.625	6.25	-60	-45
21.875	6.25	-60	-45
37.5	25	-65	-50
62.5	25	-65	-50
87.5	25	-65	-50
150	100	-65	-50
250	100	-65	-50
>400 to receive band	30 (s)	-75	-55
in the receive band	30 (s)	-100	-70

25 kHz Mobile Transmitter ACCP Requirements

Offset from Center Frequency (kHz)	Measurement Bandwidth (kHz)	Maximum ACCP Relative (dBc)	Maximum ACCP Absolute (dBm)
15.625	6.25	-40	not specified
21.875	6.25	-60	-45
37.5	25	-65	-50
62.5	25	-65	-50
87.5	25	-65	-50
150	100	-65	-50
250	100	-65	-50
>400 to receive band	30 (s)	-75	-55
in the receive band	30 (s)	-100	-70

150 kHz Mobile Transmitter ACCP Requirements

Offset from Center Frequency (kHz)	Measurement Bandwidth (kHz)	Maximum ACCP Relative (dBc)	Maximum ACCP Absolute (dBm)
100	50	-40	not specified
200	50	-50	-35
300	50	-50	-35
400	50	-50	-35
600 to 1000	30 (s)	-60	-45
1000 to receive band	30 (s)	-70	-55
in the receive band	30 (s)	-100	-75

6.25 kHz Base Transmitter ACCP Requirements

Offset from Center Frequency (kHz)	Measurement Bandwidth (kHz)	Maximum ACCP (dBc)
6.25	6.25	-40
12.5	6.25	-60
18.75	6.25	-60
25	6.25	-65
37.5	25	-65
62.5	25	-65
87.5	25	-65
150	100	-65
250	100	-65
>400 to receive band	30 (s)	-80 (continues @-6dB/oct)
in the receive band	30 (s)	-100

12.5 kHz Base Transmitter ACCP Requirements

Offset from Center Frequency (kHz)	Measurement Bandwidth (kHz)	Maximum ACCP (dBc)
9.375	6.25	-40
15.625	6.25	-60
21.875	6.25	-60
37.5	25	-60
62.5	25	-65
87.5	25	-65
150	100	-65
250	100	-65
>400 to receive band	30 (s)	-80 (continues @-6dB/oct)
In the receive band	30 (s)	-100

25 kHz Base Transmitter ACCP Requirements

Offset from Center Frequency (kHz)	Measurement Bandwidth (kHz)	Maximum ACCP (dBc)
15.625	6.25	-40
21.875	6.25	-60
37.5	25	-60
62.5	25	-65
87.5	25	-65
150	100	-65
250	100	-65
>400 to receive band	30 (s)	-80 (continues @-6dB/oct)
in the receive band	30 (s)	-100

150 kHz Base Transmitter ACCP Requirements

Offset from Center Frequency (kHz)	Measurement Bandwidth (kHz)	Maximum ACCP (dBc)
100	50	-40
200	50	-50
300	50	-55
400	50	-60
600 to 1000	30 (s)	-65
1000 to receive band	30 (s)	-75 (continues @ -6dB/oct)
in the receive band	30 (s)	-100

(b) *ACCP measurement procedure*. The following are procedures for making transmitter measurements. For time division multiple access (TDMA) systems, the measurements are to be made under TDMA operation only during time slots when the transmitter is on. All measurements must be made at the input to the transmitter's antenna. Measurement bandwidth used below implies an instrument that measures the power in many narrow bandwidths (e.g. 300 Hz) and integrates these powers across a larger band to determine power in the measurement bandwidth.

(1) *Setting reference level:* Using a spectrum analyzer capable of ACCP measurements, set the measurement bandwidth to the channel size. For example, for a 6.25 kHz transmitter, set the measurement bandwidth to 6.25 kHz; for a 150 kHz transmitter, set the measurement bandwidth to 150 kHz. Set the frequency offset of the measurement bandwidth to zero and adjust the center frequency of the spectrum analyzer to give the power level in the measurement bandwidth. Record this power level in dBm as the "reference power level".

(2) *Measuring the power level at frequency offsets <600kHz:* Using a spectrum analyzer capable of ACCP measurements, set the measurement bandwidth as shown in the tables above. Measure the ACCP in dBm. These measurements should be made at maximum power. Calculate the coupled power by subtracting the measurements made in this step from the reference power measured in the previous step. The absolute ACCP values must be less than the values given in the table for each condition above.

(3) *Measuring the power level at frequency offsets >600kHz:* Set a spectrum analyzer to 30 kHz resolution bandwidth, 1 MHz video bandwidth and sample mode detection. Sweep ± 6 MHz from the carrier frequency. Set the reference level to the RMS value of the transmitter power and note the absolute power. The response at frequencies greater than 600 kHz must be less than the values in the tables above.

(4) *Upper Power Limit Measurement*: The absolute coupled power in dBm measured above must be compared to the table entry for each given frequency offset. For those mobile stations with power control, these measurements should be repeated with power control at maximum power reduction. The absolute ACCP at maximum power reduction must be less than the values in the tables above.

(c) *Out-of-band emission limit*. On any frequency outside of the frequency ranges covered by the ACCP tables in this section, the power of any emission must be reduced below the unmodulated carrier power (P) by at least 43 + 10 log (P) dB.

(d) *Authorized bandwidth*. Provided that the ACCP requirements of this section are met, applicants may request any authorized bandwidth that does not exceed the channel size.

§ 90.545 TV/DTV interference protection criteria.

Public safety base, control, and mobile transmitters in the 764-776 MHz and 794-806 MHz frequency bands must be operated only in accordance with the rules in this section, to reduce the potential for interference to public reception of the signals of existing TV and DTV broadcast stations transmitting on TV Channels 62, 63, 64, 65, 67, 68 or 69.

(a) *D/U ratios*. Licensees of public safety stations must choose site locations that are a sufficient distance from co-channel and adjacent channel TV and DTV stations, and/or must use reduced transmitting power or transmitting antenna height such that the following minimum desired signal to undesired signal ratios (D/U ratios) are met:

(1) The minimum D/U ratio for co-channel stations is 40 dB at the hypothetical Grade B contour (64 dBµV/m) (88.5 kilometers or 55.0 miles) of the TV station or 17 dB at the equivalent Grade B contour (41 dBµV/m) (88.5 kilometers or 55.0 miles) of the DTV station.

(2) The minimum D/U ratio for adjacent channel stations is 0 dB at the hypothetical Grade B contour (64 dBµV/m) (88.5 kilometers or 55.0 miles) of the TV station or -23 dB at the equivalent Grade B contour (41 dBµV/m) (88.5 kilometers or 55.0 miles) of the DTV station.

(b) *Maximum ERP and HAAT*. The maximum effective radiated power (ERP) and the antenna height above average terrain (HAAT) of the proposed land mobile base station, the associated control station, and the mobile transmitters shall be determined using the methods described in this section.

(1) Each base station is limited to a maximum ERP of 1000 watts.

(2) Each control station is limited to a maximum ERP of 200 watts and a maximum HAAT of 61 m. (200 ft).

(3) Each mobile station is limited to a maximum ERP of 30 watts and a maximum antenna height of 6.1 m. (20 ft.).

(4) Each portable (handheld) transmitter is limited to a maximum ERP of 3 watts.

(5) All transmitters are subject to the power reductions given in Figure B of § 90.309 of this chapter, for antenna heights higher than 152 meters (500 ft).

(c) *Methods*. The methods used to calculate TV contours and antenna heights above average terrain are given in §§ 73.683 and 73.684 of this chapter. Tables to determine the necessary minimum distance from the public safety station to the TV/DTV station, assuming that the TV/DTV station has a hypothetical or equivalent Grade B contour of 88.5 kilometers (55.0 miles), are located in § 90.309 and labeled as Tables B, D, and E. Values between those given in the tables may be determined by linear interpolation. The locations of existing and proposed TV/DTV stations during the transition period are given in Part 73 of this chapter and in the final proceedings of MM Docket No. 87-268. The DTV allotments are:

STATE	CITY	NTSC TV Ch.	DTV Ch.	ERP (kW)	HAAT (m)
California	Stockton	64	62	63.5	874
California	Los Angeles	11	65	688.7	896
California	Riverside	62	68	180.1	723
California	Concord	42	63	61.0	856
Pennsylvania	Allentown	39	62	50.0	302
Pennsylvania	Philadelphia	6	64	1000.0	332
Pennsylvania	Philadelphia	10	67	791.8	354
Puerto Rico	Aguada	50	62	50.0	343
Puerto Rico	Mayaguez	16	63	50.0	347
Puerto Rico	Naranjito	64	65	50.0	142
Puerto Rico	Aguadilla	12	69	691.8	665

The transition period is scheduled to end on December 31, 2006. After that time, unless otherwise directed by the Commission, public safety stations will no longer be required to protect reception of co-channel or adjacent channel TV/DTV stations.

(1) Licensees of stations operating within the ERP and HAAT limits of paragraph (b) must select one of three methods to meet the TV/DTV protection requirements, subject to Commission approval:

(i) utilize the geographic separation specified in the tables referenced below;

(ii) submit an engineering study justifying the proposed separations based on the actual parameters of the land mobile station and the actual parameters of the TV/DTV station(s) it is trying to protect; or,

(iii) obtain written concurrence from the applicable TV/DTV station(s). If this method is chosen, a copy of the agreement must be submitted with the application.

(2) The following is the method for geographic separations.

(i) Base stations having an antenna height (HAAT) less than 152 m. (500 ft.) shall afford protection to co-channel and adjacent channel TV/DTV stations in accordance with the values specified in Table B (co-channel frequencies based on 40 dB protection) and Table E (adjacent channel frequencies based on 0 dB protection) in § 90.309 of this part. For base stations having an antenna height (HAAT) between 152-914 meters (500-3,000 ft.) the effective radiated power must be reduced below 1 kilowatt in accordance with the values shown in the power reduction graph in Figure B in § 90.309 of this part. For heights of more than 152 m. (500 ft.) above average terrain, the distance to the radio path horizon will be calculated assuming smooth earth. If the distance so determined equals or exceeds the distance to the hypothetical or equivalent Grade B contour of a co-channel TV/DTV station (*i.e.*, it exceeds the distance from the appropriate Table in § 90.309 to the relevant TV/DTV station) an authorization will not be granted unless it can be shown in an engineering study (method 2) that actual terrain considerations are such as to provide the desired protection at the actual Grade B contour (64 dBµV/m for TV and 41 dBµV/m for DTV stations), or that the effective radiated power will be further reduced so that, assuming free space attenuation, the desired protection at the actual Grade B contour (64 dBµV/m for TV and 41 dBµV/m coverage contour for DTV stations) will be achieved. Directions for calculating powers, heights, and reduction curves are listed in § 90.309 for land mobile stations. Directions for calculating coverage contours are listed in §§ 73.683-685 for TV stations and in § 73.625 for DTV stations.

(ii) Control and mobile stations (including portables) are limited in height and power and therefore shall afford protection to co-channel and adjacent channel TV/DTV stations in accordance with the values specified in Table D (co-channel frequencies based on 40 dB protection) in § 90.309 of this part and a minimum distance of 8 kilometers (5 miles) from all adjacent channel TV/DTV station hypothetical or equivalent Grade B contours. (adjacent channel frequencies based on 0 dB protection for TV stations and -23 dB for DTV stations). Since control and mobile stations may affect different TV/DTV stations than the associated base station, particular care must be taken by applicants to ensure that all the appropriate TV/DTV stations are considered (*e.g.* a base station may be operating on TV Channel 64 and the mobiles on TV Channel 69, in which case TV Channels 63, 64, 65, 68, and 69 must be protected). Control and mobile stations shall keep a minimum distance of 96.5 kilometers (60 miles) from all adjacent channel TV/DTV stations. Since mobiles and portables are able to move and communicate with each other, licensees or coordinators must determine the areas where the mobiles can and cannot roam in order to protect the TV/DTV stations, and advise the mobile operators of these areas and their restrictions.

(iii) In order to protect certain TV/DTV stations and to ensure protection from these stations which may have extremely large contours due to unusual height situations, an additional distance factor must be used by all public safety base, control and mobile stations. For all co-channel and adjacent channel TV/DTV stations which have an HAAT between 350 and 600 meters, public safety stations must add the following DISTANCE FACTOR to the value obtained from the referenced Tables in § 90.309 and to the distance for control and mobile stations on adjacent TV/DTV channels (96.5 km).

> DISTANCE FACTOR = (TV/DTV HAAT – 350) ÷ 14 in kilometers, where HAAT is the TV or DTV station antenna height above average terrain obtained from its authorized or proposed facilities, whichever is greater.

For all co-channel and adjacent channel TV/DTV stations which have an antenna height above average terrain greater than 600 meters, public safety stations must add 18 kilometers as the DISTANCE FACTOR to the value obtained from the referenced Tables in § 90.309 and to the distance for control and mobile stations on adjacent TV/DTV channels (96.5 km).

Note: The 88.5 km (55.0 mi) Grade B service contour (64 dBμV/m) is based on a hypothetical TV station operating at an effective radiated power of one megawatt, a transmitting antenna height above average terrain of 610 meters (2000 feet) and the Commission's R-6602 F(50,50) curves. *See* § 73.699 of this chapter. Maximum facilities for TV stations operating in the UHF band are 5 megawatts effective radiated power at an antenna HAAT of 610 meters (2,000 feet). *See* § 73.614 of this chapter. The equivalent contour for DTV stations is based on a 41 dBμV/m signal strength and the distance to the F(50,90) curve. *See* § 73.625 of this chapter.

§ 90.547 Interoperability channel capability requirement.

Mobile and portable transmitters designed pursuant to standards adopted by the National Coordination Committee to operate in the 764-776 MHz and 794-806 MHz frequency bands must be capable of operating on any of the designated nationwide narrowband interoperability channels approved by the Commission.

§ 90.549 Transmitter certification.

Transmitters operated in the 764-776 MHz and 794-806 MHz frequency bands must be certificated as required by § 90.203.

§ 90.551 Construction requirements.

Each station authorized under this subpart to operate in the 764-776 MHz and 794-806 MHz frequency bands must be constructed and placed into operation within 12 months from the date of grant of the authorization. However, licensees may request a longer construction period, up to but not exceeding 5 years, pursuant to § 90.155(b).

APPENDIX F

PROPOSED RULES FOR THIRD NOTICE OF PROPOSED RULE MAKING

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

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

AUTHORITY: Secs. 4, 251-2, 303, 309, 332 and 337, 48 Stat 1066, 1082, as amended; 47 U.S.C. 154, 251-2, 303, 309 and 337, unless otherwise noted.

2. Section 90.1 is amended by revising paragraph (b), to read as follows:

§ 90.1 Basis and purpose.

* * * * *

(b) *Purpose*. This part states the conditions under which radio communications systems may be licensed and used in the Public Safety, Special Emergency, Industrial, Land Transportation and Radiolocation Services. These rules do not govern the licensing of radio systems belonging to and operated by the United States.

* * * * *

3. Section 90.20 is amended by adding "78" to the "Limitations" column for nine of the existing entries in the table in paragraph (c)(3), by adding a new paragraph (d)(78), and by adding a new paragraph (g) to read as follows:

§ 90.20 Public Safety Pool.

* * * * *

(c) * * *

(3) * * *

PUBLIC SAFETY POOL FREQUENCY TABLE

Frequency or band	Class of station(s)	Limitations	Coordinator
* * * * *	* * * * *	* * * * *	* * * * *
151.1375	Base or mobile	27, 28, 78.	PH
* * * * *	* * * * *	* * * * *	* * * * *
154.4525	Base or mobile	27, 28, 78.	PF
* * * * *	* * * * *	* * * * *	* * * * *

155.7525	Base or mobile	27, 78.	PX
* * * * *	* * * * *	* * * * *	* * * * *
158.7375	Base or mobile	27, 78.	PP
* * * * *	* * * * *	* * * * *	* * * * *
159.4725	Base or mobile	27, 78.	PO
* * * * *	* * * * *	* * * * *	* * * * *
453.20625	Base or mobile	44, 78.	PX
* * * * *	* * * * *	* * * * *	* * * * *
453.99375	Base or mobile	44, 78.	PX
* * * * *	* * * * *	* * * * *	* * * * *
458.20625	Mobile	44, 78.	PX
* * * * *	* * * * *	* * * * *	* * * * *
458.99375	Mobile	44. 78.	PX
* * * * *	* * * * *	* * * * *	* * * * *

(d) * * *

(78) These channels are designated for interoperability-only use.

* * * * *

(g) *VPC interoperability frequencies.*

(1) *Working channels in the VHF 156-162 MHz band.* The channel pairs listed in the tables below were formerly allocated in § 80.371 of this chapter for VHF Public Coast Stations as public correspondence channels numbered 25, 84, and 85 and were also shared under former § 90.283 by Industrial and Land Transportation Radio Service (I/LT) stations and grandfathered public safety stations. The 25 kHz channel pairs are available exclusively for assignment to public safety entities for interoperable channels of communication only in the Economic Areas (EAs) as shown below in Table A.

(2) Service areas in the marine VHF 156-162 MHz band are VHF Public Coast areas (VPCs). As listed in Table A to this paragraph, these areas are based on, and composed of one or more of, the U.S Department of Commerce's 172 Economic Areas (EAs). See 60 FR 13114 (March 10, 1995). Maps of the

EAs and VPCs are available for public inspection and copying at the Public Safety and Private Wireless Division, room 8010, 2025 M Street, NW, Washington, DC.

Table A - List of Channels Available by Public Coast Area

VHF Public Coast Areas (VPCs)		
VPCs	EAs	Channel Pairs
1 *(Northern Atlantic)*	1-5, 10	none
2 *(Mid-Atlantic)*	9, 11-23, 25, 42, 46	none
3 *(Southern Atlantic)*	24, 26-34, 37, 38, 40, 41, 174	none
4 *(Mississippi River)*	34, 36, 39, 43-45, 47-53, 67-107, 113, 116-120, 122-125, 127, 130-134, 176	none
5 *(Great Lakes)*	6-8, 54-66, 108, 109	none
6 *(Southern Pacific)*	160-165	none
7 *(Northern Pacific)*	147, 166-170	none
8 *(Hawaii)*	172, 173, 175	none
9 *(Alaska)*	171	none
10 *(Grand Forks)*	110	25, 84
11 *(Minot)*	111	25, 84
12 *(Bismarck)*	112	25, 84
13 *(Aberdeen)*	114	25, 84
14 *(Rapid City)*	115	25, 84
15 *(North Platte)*	121	25, 84
16 *(Western Oklahoma)*	126	25, 85
17 *(Abilene)*	128	25, 85
18 *(San Angelo)*	129	25, 85
19 *(Odessa-Midland)*	135	25, 85
20 *(Hobbs)*	136	25, 85
21 *(Lubbock)*	137	25, 85
22 *(Amarillo)*	138	25, 85
23 *(Santa Fe)*	139	25, 84

24 *(Pueblo)*	140	25, 84
25 *(Denver-Boulder-Greeley)*	141	25, 84
26 *(Scottsbluff)*	142	25, 84
27 *(Casper)*	143	25, 84
28 *(Billings)*	144	25, 84
29 *(Great Falls)*	145	25, 84
30 *(Missoula)*	146	25, 84
31 *(Idaho Falls)*	148	25, 85
32 *(Twin Falls)*	149	25, 85
33 *(Boise City)*	150	25, 84
34 *(Reno)*	151	25, 84
35 *(Salt Lake City-Ogden)*	152	25, 85
36 *(Las Vegas)*	153	25, 84
37 *(Flagstaff)*	154	25, 84
38 *(Farmington)*	155	25, 84
39 *(Albuquerque)*	156	25, 84
40 *(El Paso)*	157	25, 85
41 *(Phoenix-Mesa)*	158	25, 84
42 *(Tucson)*	159	25, 84

Table B - List of Channel Center Frequencies by Corresponding Channel Number

Channel Number	Base Station Transmit Center Frequency in MHz	Mobile Station Transmit Center Frequency in MHz
25	161.850	157.250
84	161.825	157.225
85	161.875	157.275

(3) Public safety eligible applicants shall apply for these channel pairs only for the purpose of interoperability using the following standards and procedures:

(i) All applicants must comply with the relevant technical sections under this part unless otherwise stated in this section and provide evidence of frequency coordination in accordance with § 90.175.

(ii) Station power, as measured at the output terminals of the transmitter, must not exceed 50 Watts for base stations and 20 Watts for mobile stations, except in accordance with the provisions of paragraph (vi). Antenna height (HAAT) must not exceed 122 meters (400 feet) for base stations and 4.5 meters (15 feet) for mobile stations, except in accordance with paragraph (vi). Such base and mobile channels shall not be operated on board aircraft in flight.

(iii) Frequency protection must be provided to other stations in accordance with the following guidelines for each channel and for each area and adjacent area:

(a) Protect coast stations licensed prior to July 6, 1998, by the required separations shown in Table C below.

(b) Protect I/LT stations by frequency coordination in accordance with § 90.175 of this part.

(c) Protect other public safety stations by frequency coordination and by agreement with the other public safety stations.

(d) *Where the Public Safety designated channel is not a Public Safety designated channel in an adjacent EA:* Applicants shall engineer base stations such that the maximum signal strength at the boundary of the adjacent EA does not exceed 5 dBµV/m.

(iv) The following table, along with the antenna height (HAAT) and power (ERP), must be used to determine the minimum separation required between proposed base stations and co-channel public coast stations licensed prior to July 6, 1998 under Part 80 of this chapter. Applicants whose exact ERP or HAAT are not reflected in the table must use the next highest figure shown.

Table C - Required Separation in Kilometers (Miles) of Base Station From Public Coast Stations

Base Station Characteristics					
HAAT	ERP (watts)				
Meters (feet)	400	300	200	100	50
15 (50)	138 (86)	135 (84)	129 (80)	129 (80)	116 (72)
30 (100)	154 (96)	151 (94)	145 (90)	137 (85)	130 (81)
61 (200)	166 (103)	167 (104)	161 (100)	153 (95)	145 (90)
122 (400)	187 (116)	177 (110)	183 (114)	169 (105)	159 (99)

(v) In the event of interference, the Commission may require, without a hearing, licensees of base stations authorized under this section that are located within 241 kilometers (150 miles) of a co-channel public coast, I/LT, or grandfathered public safety station licensed prior to July 6, 1998, or an international border, to reduce power, decrease antenna height, and/or install directional antennas. Mobile stations must be operated only within radio range of their associated base station.

(vi) Applicants seeking to be licensed for stations exceeding the power/antenna height limits of the table in paragraph (iv) must request a waiver of that paragraph and must submit with their application an interference analysis, based upon an appropriate, generally-accepted terrain-based propagation model, that

shows that co-channel protected entities, described in paragraph (iii), would receive the same or greater interference protection than the relevant criteria outlined in paragraph (iii).

4. Section 90.179 is amended by revising paragraph (a) to read as follows:

§ 90.179 Shared use of radio stations.

* * * * *

(a) Persons may share a radio station only on frequencies for which they would be eligible for a separate authorization. Licensees under Subpart R may share the use of their systems with any entity that would be eligible for licensing under § 90.523 and Federal government entities.

* * * * *

5. A new section 90.553 is added to read as follows:

§ 90.553 GNSS protection.

In order to provide adequate protection to receivers of the Global Navigation Satellite System (GNSS) which will utilize the Radionavigation-Satellite Service (space-to-Earth) band, mobile units must meet a minimum second harmonic suppression standard in the frequency range of 1559-1605 MHz of 90 dB down from the maximum effective radiated power of the carrier and handhelds and portable units must meet a minimum second harmonic suppression standard in the frequency range of 1559-1605 MHz of 80 dB down from the maximum effective radiated power of the carrier. This standard applies only to equipment operating in the frequency range of 779.5-802.5 MHz.

APPENDIX G

Technical Analysis of Second Harmonics Pertaining to Global Navigation Satellite System (GNSS) Receivers

1. This section analyzes the proposed public safety base, control, and mobile stations second harmonic suppression levels needed to meet an out-of-band signal value of -80 dBW/700 Hz at a distance of 30 meters (100 feet) from GLONASS and GPS receivers as recommended by the NTIA and FAA based on the RTCA Inc. Special Committee 159 in its final report.[1]

2. *Mobile Satellite Service Standards*. We consider power densities and absolute values of interference levels such as those raised by NTIA in the licensing of Mobile Satellite Service (MSS) earth terminals which operate in the band 1610-1660.5 MHz (adjacent channel).[2] In the referenced letter, NTIA and the FAA recommended to the Commission that MSS out-of-band signals be limited to -70 dBW/MHz for wide band emissions and -80 dBW/700 Hz for narrow band emissions (both values were determined at a distance of 30 meters from the GPS or GLONASS receiver) to protect GLONASS receivers in the 1559-1605 Mhz band after January 1, 2002, and -64 dBW/MHz and -74 dBW/700 Hz for narrow band emissions prior to January 1, 2002.[3] We choose the levels after January 1, 2002 since these values represent the worse case scenario. We compare the absolute signal levels of mobile units for the proposed bandwidths of 25 kHz, 12.5 kHz, and 6.25 kHz with the value of -80 dB/700 Hz from the GLONASS receiver for narrow band emissions. We have not compared the value of -70 dBW/MHz for wide band emissions because this value was developed primarily for MSS transmitters and the public safety equipment will operate with narrow band emissions usually of 25 kHz or below and not over 50 kHz for the wide band channels.

3. We understand that the -80 dBW is used as an effective radiated power (ERP) for the second harmonic from our mobile stations. A mobile with an output power of 30 watts operating on 800 MHz has an ERP of 14.77 dBW. A 3 watt handheld has an ERP of 4.77 dBW. The 30 watt mobile would need 95 dB of harmonic suppression to meet the -80 dBW level, and the 3 watt handheld would need 85 dB of harmonic suppression to meet the -80 dBW level. This compares to our present rules under Section 90.210 which requires 35 dB of suppression for out-of-band signals removed from the carrier up to 250% and 58 dB of suppression for 30 watt mobiles for signals over 250% and 48 dB of suppression for 3 watt mobiles.

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[1] RTCA, Inc. is a voluntary government/industry group which performs studies and makes recommendations pertaining to radio use for aviation and is budgeted by the FAA.

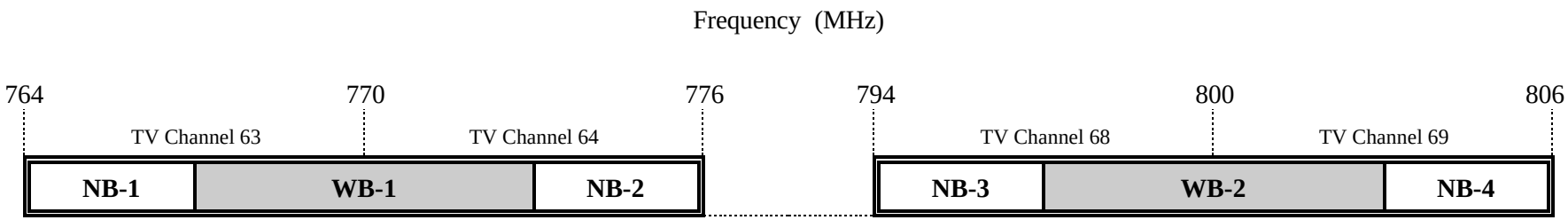
[2] *See* Letter from Richard D. Parlow, Associate Administrator, Spectrum Management, NTIA, to Regina M. Keeney, Chief, International Bureau, Federal Communications Commission, dated Sept. 18, 1997.

[3] *Id.*

APPENDIX H

Channelization Plan for the 700 MHz Public Safety Band

Overview



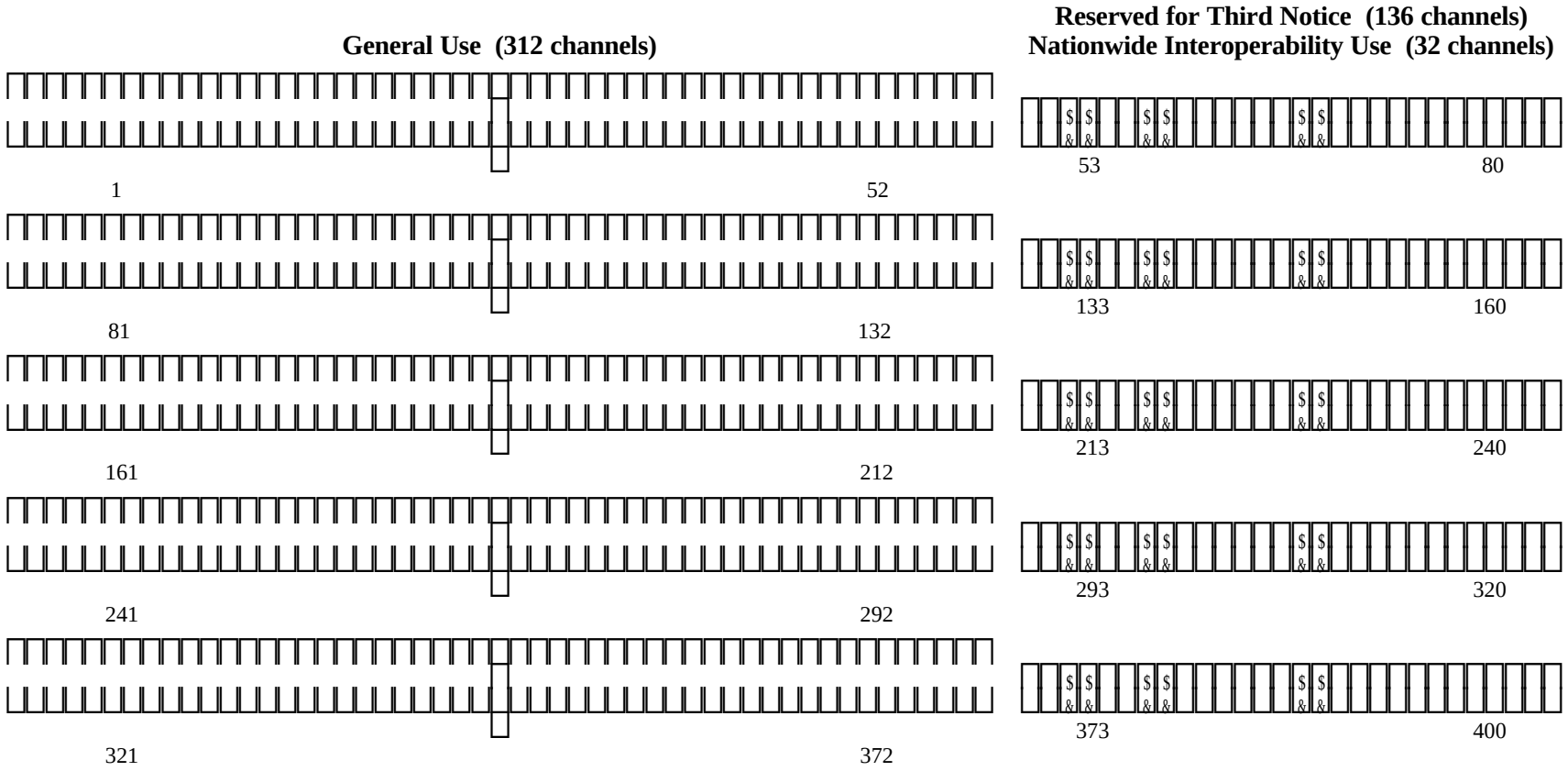
NB = Narrowband Segments

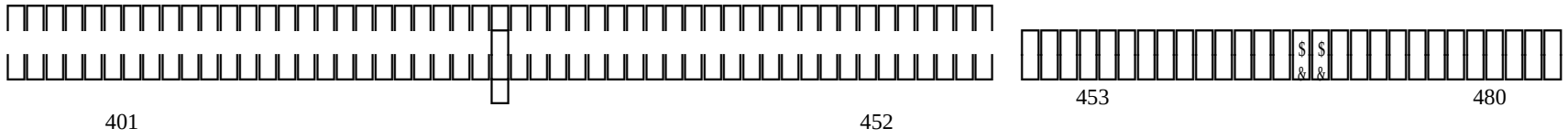
WB = Wideband Segments

Narrowband Segment 1 (NB-1)

764 to 767 MHz
(Lower half of TV Channel 63)

6.25 kHz Channels Shown Individually





General Use Channels or
Channels Reserved for Third Notice

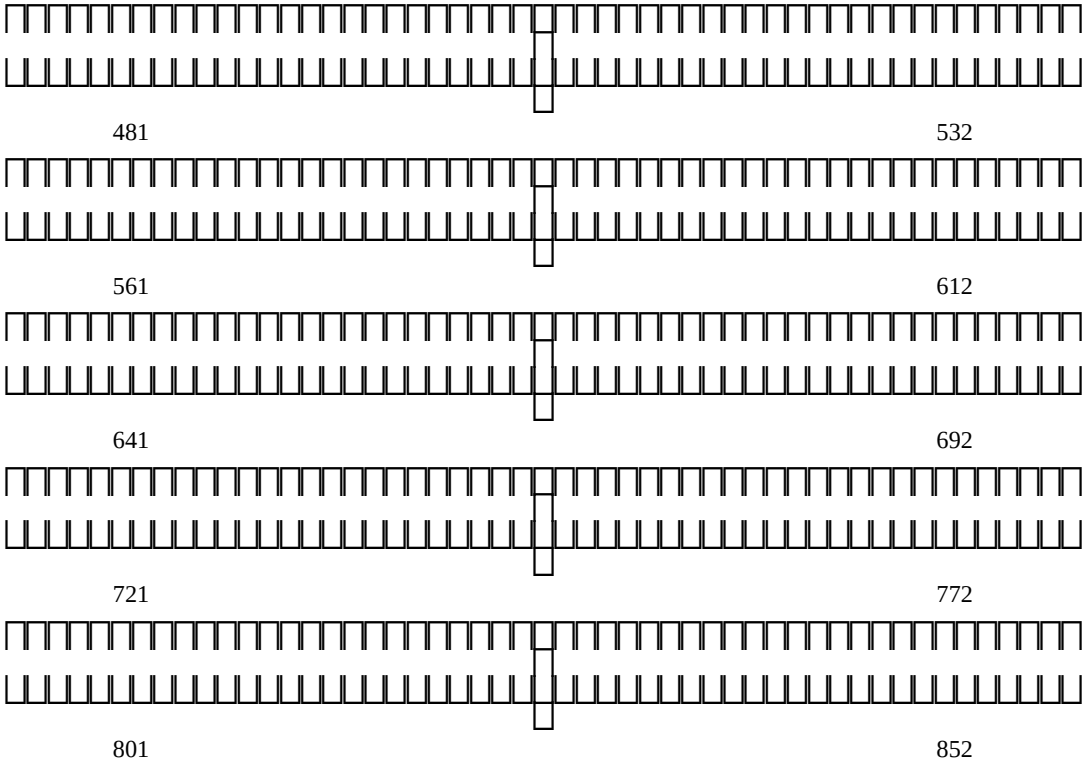
Nationwide Interoperability
Channels

Narrowband Segment 2 (NB-2)

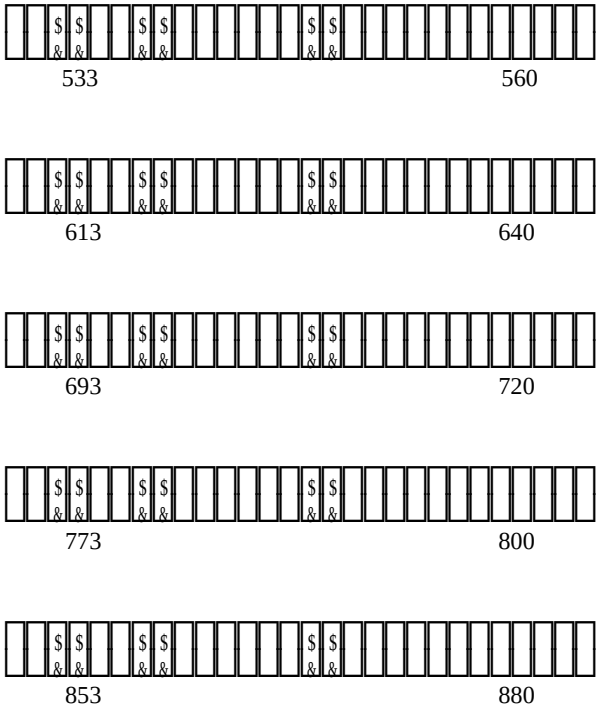
773 to 776 MHz
(Upper half of TV Channel 64)

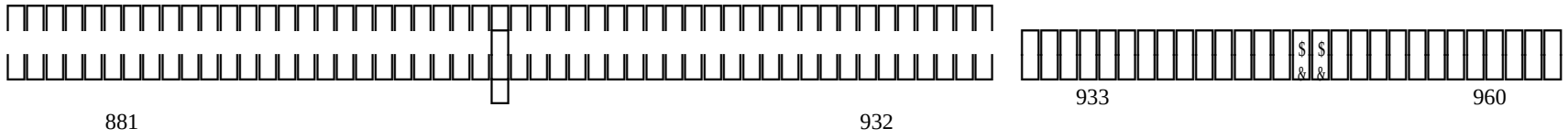
6.25 kHz Channels Shown Individually

General Use (312 channels)



Reserved for Third Notice (136 channels)
Nationwide Interoperability Use (32 channels)





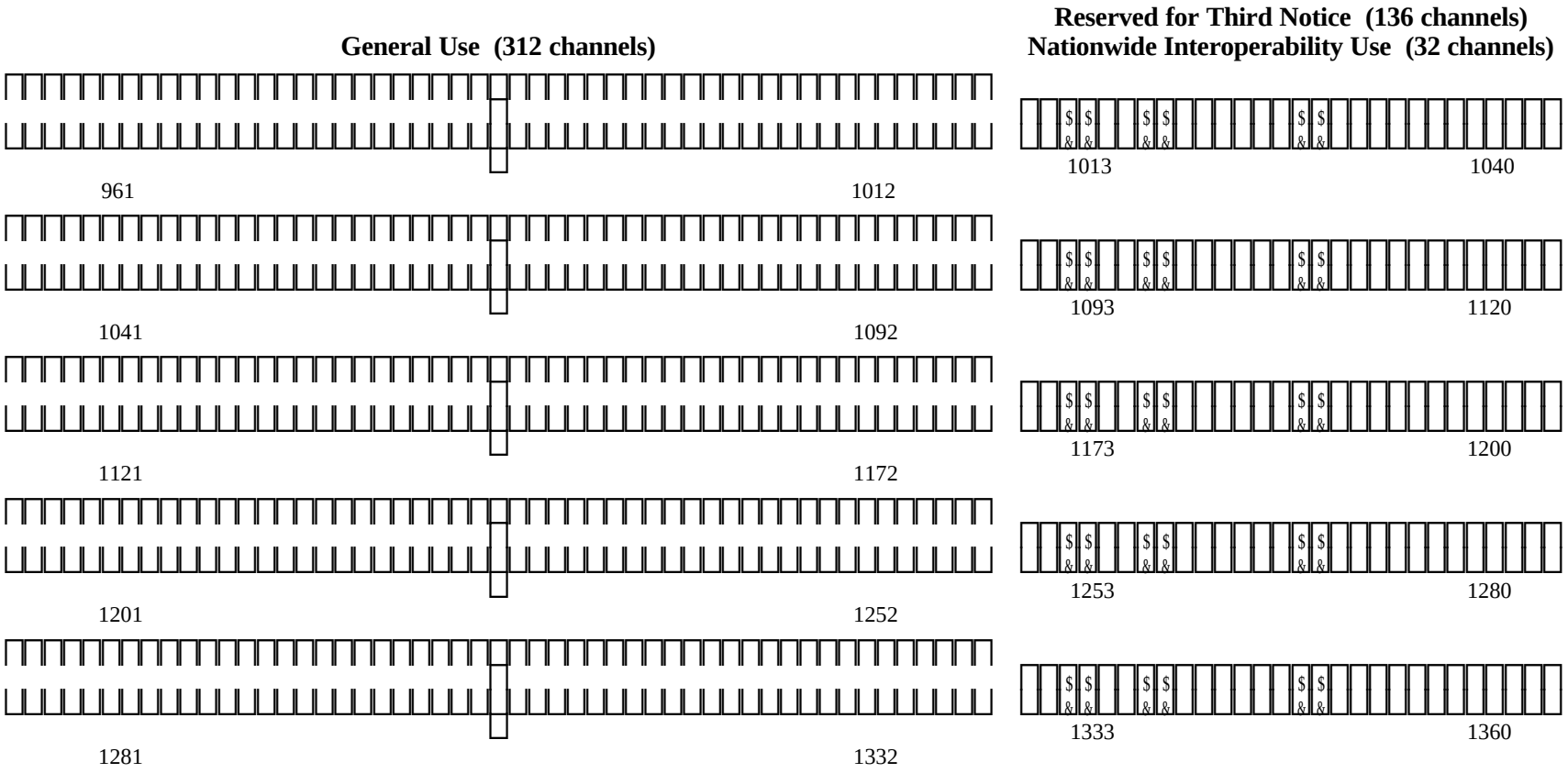
General Use Channels or
Channels Reserved for Third Notice

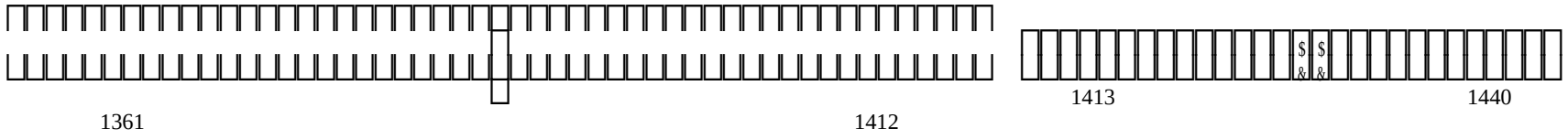
Nationwide Interoperability
Channels

Narrowband Segment 3 (NB-3)

794 to 797 MHz
(Lower half of TV Channel 68)

6.25 kHz Channels Shown Individually





General Use Channels or
Channels Reserved for Third Notice

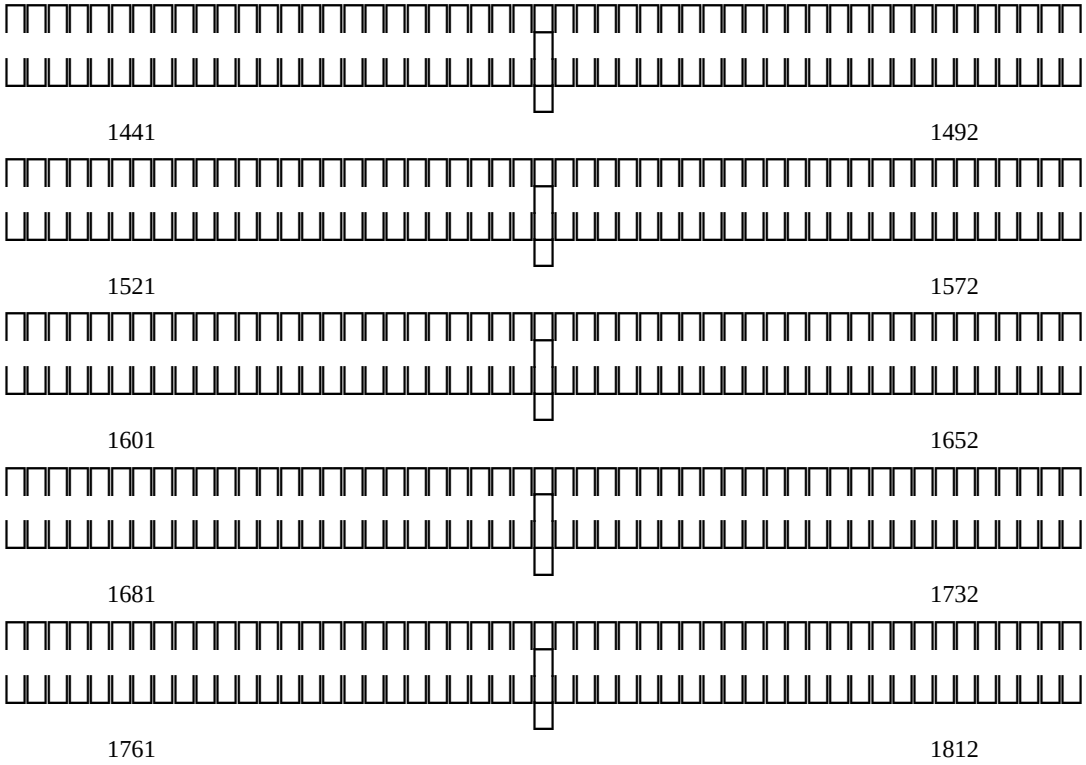
Nationwide Interoperability
Channels

Narrowband Segment 4 (NB-4)

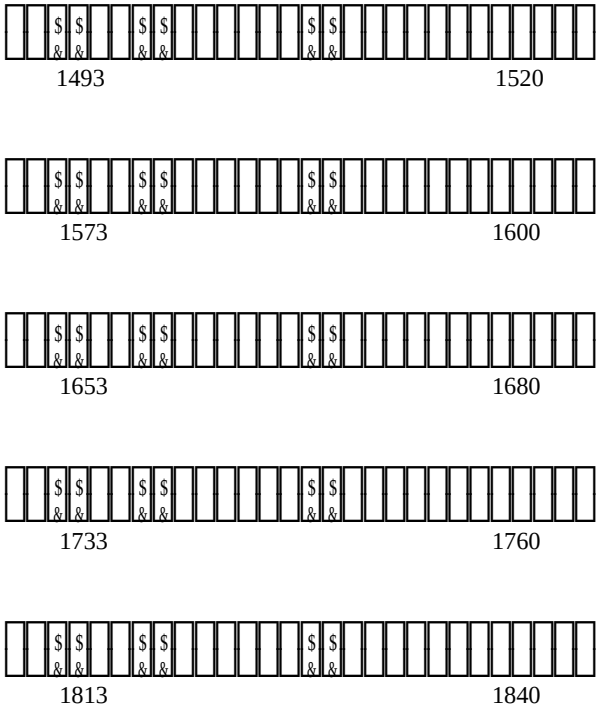
803 to 806 MHz
(Upper half of TV Channel 69)

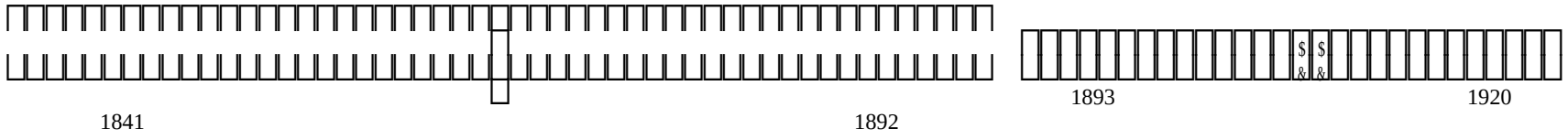
6.25 kHz Channels Shown Individually

General Use (312 channels)



Reserved for Third Notice (136 channels)
Nationwide Interoperability Use (32 channels)





General Use Channels or
Channels Reserved for Third Notice

$ & Nationwide Interoperability Channels

Wideband Segment 1 (WB-1)

767 to 773 MHz

50 kHz Channels Shown as Groups of 3 (150 kHz)

(Upper half of TV Channel 63)

R	R	NIO	GU	GU	GU	GU	GU	GU	GU	GU	NIO	R	R	R	R	R	R	R	NIO
1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24	25-27	28-30	31-33	34-36	37-39	40-42	43-45	46-48	49-51	52-54	55-57	58-60

(Lower half of TV Channel 64)

NIO	R	R	R	R	R	R	R	NIO	GU	GU	GU	GU	GU	GU	GU	GU	NIO	R	R
61-63	64-66	67-69	70-72	73-75	76-78	79-81	82-84	85-87	88-90	91-93	94-96	97-99	100-102	103-105	106-108	109-111	112-114	115-117	118-120

NIO - Nationwide Interoperability

R - Reserved for Third Notice

GU - General Use

Wideband Segment 2 (WB-2)

797 to 803 MHz

50 kHz Channels Shown as Groups of 3 (150 kHz)

(Upper half of TV Channel 68)

R	R	NIO	GU	GU	GU	GU	GU	GU	GU	GU	NIO	R	R	R	R	R	R	R	NIO
121-123	124-126	127-129	130-132	133-135	136-138	139-141	142-144	145-147	148-150	151-153	154-156	157-159	160-162	163-165	166-168	169-171	172-174	175-177	178-180

(Lower half of TV Channel 69)

NIO	R	R	R	R	R	R	R	NIO	GU	GU	GU	GU	GU	GU	GU	GU	NIO	R	R
181-183	184-186	187-189	190-192	193-195	196-198	199-201	202-204	205-207	208-210	211-213	214-216	217-219	220-222	223-225	226-228	229-231	232-234	235-237	238-240

NIO - Nationwide Interoperability

R - Reserved for Third Notice

GU - General Use