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	)	

FOURTH MEMORANDUM OPINION AND ORDER

Adopted: March 5, 2002 **Released: March 14, 2002**

By the Commission:

TABLE OF CONTENTS

Paragraph

I. INTRODUCTION

1. In the *Fourth Report and Order and Fifth Notice of Proposed Rule Making* in the captioned proceeding,[1] the Commission adopted various technical and operational rules and policies regarding use of public safety frequencies in the 764-776 MHz and 794-806 MHz bands (the 700 MHz public safety band) designated for narrowband Interoperability uses.[2] The Commission's actions in the *Fourth R&O* were based on the comments received in response to the *Fourth Notice of Proposed Rule Making*, which reflected the recommendations of the Public Safety National Coordination Committee (NCC),[3] an advisory committee established in accordance with the Federal Advisory Committee Act.[4] We received four petitions for reconsideration or clarification of the *Fourth R&O*, as well as responsive comments, oppositions, replies to oppositions, and *ex parte* filings. This *Fourth Memorandum Opinion and Order* (*"Fourth MO&O"*) addresses issues raised in these petitions and other filings, and considers several matters raised *sua sponte*.

II. EXECUTIVE SUMMARY

2. We have carefully considered the issues presented on reconsideration of the *Fourth R&O*. We agree with petitioners that "secondary trunking channels"[5] ought to be evenly distributed among all four former TV channels 63, 64, 68, and 69, but decline to designate 6.25 kHz bandwidth "guard channels," immediately above and below each narrowband Interoperability channel set (12.5 kHz bandwidth). Because the proposed pre-coordination database is not yet operational, we believe it premature, at this time, to mandate that public safety entities use such a database as a condition of licensing in the 700 MHz public safety band. In addition, we continue to believe that states and local jurisdictions are in the best position to determine access priority levels, and we thus refrain from establishing nationwide, codified priority levels in the 700 MHz public safety band. Likewise, we affirm the Commission's decision not to adopt a table of channel assignments for nationwide use. Finally, we believe adoption of Project 25 Phase I as the digital voice standard for the 700 MHz public safety band Interoperability channels will allow for early entry into that spectrum by public safety entities located in areas presently unencumbered by television stations operating on TV channels 63, 64, 68, and 69; thus we do not believe a transition period is necessary before the standard becomes mandatory.

---

[1] 16 FCC Rcd 2020 (2001) ("*Fourth R&O*").

[2] The Commission has defined "Interoperability" as "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." Development of Operational, Technical and Spectrum Requirements for Meeting Federal, State and Local Public Safety Agency Communications Requirements Through the Year 2010, WT Docket No. 96-86, *First Report and Order and Third Notice of Proposed Rulemaking*, 14 FCC Rcd 152, 189-90 ¶ 76 (1998).

[3] *See* Public Safety National Coordination Committee's Recommendations to the Federal Communications Commission for Technical and Operational Standards for Use of the 764-776 MHz and 794-806 MHz Public Safety Band Pending Development of Final Rules (Feb. 25, 2000) (NCC Report). The NCC report included detailed technical information. A copy of the NCC Report can be obtained via the Internet at http://wireless.fcc.gov/publicsafety, or from Qualex International, Portals II, 445 12th Street SW, Room CY-B402, Washington, DC 20554, telephone 202-863-2893, facsimile 202-863-2898, or via e-mail qualexint@aol.com.

[4] 5 U.S.C. App. 2 (1988).

[5] In its Report, the NCC recommended that the Commission allow, but not mandate, trunking on some of the Interoperability channels on a secondary basis; these channels have become known as "secondary trunking channels." NCC Report at 9 ¶ 24; *see also Fourth R&O,* 16 FCC Rcd at 2033-37 ¶¶ 36-45.

III. BACKGROUND

3. In the *First Report and Order* in this proceeding, the Commission adopted licensing and service rules for the 700 MHz public safety band, which consists of twenty-four megahertz of radio spectrum comprised of TV Channels 63, 64, 68 and 69.[6] Specifically, the Commission adopted a band plan that designated 12.6 megahertz for General Use (approximately one-half of the spectrum),[7] 2.6 megahertz for Interoperability, and 8.8 megahertz as Reserve Spectrum.[8] In addition, the Commission found strong support for national planning for both the Interoperability spectrum and the General Use spectrum.[9] Accordingly, the Commission chartered the NCC as an advisory committee for the purpose of addressing and advising it on certain issues regarding the 700 MHz band.[10]

4. On February 25, 2000, the NCC submitted its report to the Commission, describing the participants in the NCC's decision–making process, the meetings that the NCC conducted, and the exchanges of information that occurred in developing the NCC's recommendations.[11] On August 2, 2000, the Commission released the *Fourth Notice* seeking comments on the NCC Report and its recommendations.

5. On January 17, 2001, the Commission released the *Fourth Report and Order and Fifth Notice of Proposed Rule Making*, in which it designated rules and policies for the Interoperability spectrum.[12] In the *Fourth R&O*, the Commission adopted many of the NCC's recommendations and determined that the administrative and technical oversight of operations on the Interoperability spectrum should be performed at the state level. It also permitted trunked operations on eight of the Interoperability

---

[6] *First Report and Order and Third Notice of Proposed Rulemaking*, 14 FCC Rcd 152, 162-64 ¶¶ 13-16.

[7] The amount was subsequently changed to 12.5 MHz. *See* note 14 *infra.*

[8] *Id.* at 176. The General Use spectrum is administered by regional planning committees and will be licensed for public safety services on a site-by-site basis in accordance with the relevant Commission-approved regional plan and frequency coordination. The Interoperability spectrum is designated for communications 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. Mobile units are licensed by rule and any base stations must be approved by the relevant Interoperability administrator, *e.g.*, designated state agency or RPC, and licensed site-by-site.

[9] *Id.* at 196 ¶ 90.

[10] *Id.* at 197 ¶ 92. Among its major responsibilities, the NCC was charged with: (1) formulating and submitting 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) recommending Interoperability digital modulation, trunking, and receiver standards for Commission review and approval; (3) providing voluntary assistance in the development of coordinated regional plans; and (4) providing general recommendations to the Commission on operational plans of the public safety community. *Id*. See *also* Federal Advisory Committee Act, 5 U.S.C. App. 2 (1988).

[11] For a discussion of the NCC's activities from its inception, see NCC Report at 1-4.

[12] The *Fourth R&O* treated the NCC's recommendations. We simultaneously issued a *Fifth Notice of Proposed Rule Making* regarding migration to 6.25 kHz technology on the General Use channels. We issued this as a separate notice of proposed rule making, as opposed to resolving the migration question in the *Fourth R&O,* because the issue of migration to 6.25 kHz technology on the General Use channels was not raised in the underlying *Fourth Notice of Proposed Rule Making* or in the NCC Report.

channels on a secondary basis,[13] under certain circumstances, and adopted Project 25 Phase I as the digital standard for the 700 MHz band narrowband Interoperability channels. The Commission also stated that licensees may employ encryption on any Interoperability channel, except the two calling channels, provided that they use the encryption standard specified by the Commission. Certain recommendations from the NCC and other commenters that the Commission did not codify or adopt are the subject of the petitions for reconsideration that we address in the instant *Fourth Memorandum Opinion and Order.* In addition, we take this opportunity to clarify other matters relating to the *Fourth R&O*.

6. As noted above, the Commission first adopted spectrum designations for the 700 MHz public safety band in 1998; since then, it has revised these designations twice.[14] For convenient reference, the table in Appendix D sets forth the spectrum designations to date, which are not changed in the instant *Fourth Memorandum Opinion and Order*.

IV. DISCUSSION

A. Precoordination Database

7. In the *Fourth R&O,* the Commission agreed that the pre-coordination database referenced in the NCC Report[15] had merit and could be used as an effective planning tool.[16] Nonetheless, because the database was still under development, *i.e.,* incomplete and untested, the Commission declined to require its use "at this time."[17] Of particular concern, the Commission noted that a decision to require the use of a database under development could inadvertently delay the actual use of the spectrum.[18]

8. Petitioners John S. Powell ("Powell")[19] and the Public Safety Wireless Network ("PSWN")[20] both assert that the Commission should, in fact, mandate that public safety entities use a pre-coordination

[13] Certain interoperability channels are available for non-interoperability trunked (12.5 kHz) systems on a secondary basis to interoperability. "Secondary trunking" channels can be added designated interoperability channels when needed for non-interoperability trunked 25 kHz systems. In the *Fourth R&O*, the Commission established the parameters of permissible secondary trunking use. *See* paras. 11-13 *infra.*

[14] The *Fourth R&O* designated 0.2 megahertz of Reserve spectrum, adjacent to the eight Interoperability channels, to be Secondary Trunking channels. *See Fourth R&O,* 16 FCC Rcd at 2036-37 ¶ 44-45. In September 2000, the Commission revised the 1998 band plan by adopting, *inter alia*, "State License" and "Low Power" designations. *See* The Development of Operational, Technical and Spectrum Requirements for Meeting Federal, State and Local Public Safety Agency Communications Requirements Through the Year 2010, WT Docket No. 96-86, *Third Memorandum Opinion and Order and Third Report and Order*, 15 FCC Rcd 19844, 19848 (2000).

[15] In its Report, the NCC noted that "[t]he National Public Safety Telecommunications Council (NPSTC) has requested the NCC to recommend that the Commission take whatever action is necessary to ensure that the Regional Planning Committees make mandatory use of a 700 MHz public safety pre-coordination database when specifying interoperability channel assignments. The database is to be used on a real time basis to provide optimum spectrum use and to avoid selection of channels that would result in interference conflicts. The database would be provided and maintained by the National Law Enforcement and Corrections Technology Center – Rocky Mountain Region (NLETC) and would be funded by the National Institute of Justice (NIJ)." NCC Report at 23 ¶ 74 (footnotes omitted).

[16] *Fourth R&O,* 16 FCC Rcd at 2028 ¶ 18 *citing* Joint Commenters Comments at 16.

[17] *Fourth R&O,* 16 FCC Rcd at 2028 ¶ 18.

[18] *Fourth R&O,* 16 FCC Rcd at 2028 ¶ 18.

[19] John Powell is a 25-year veteran sergeant with the University of California Police Department at Berkeley, California. Among other positions, he currently chairs the NCC's Interoperability Committee. Powell Petition at 2-4.

database.[21] Expressing concern that not mandating participation in such a database will result in incomplete or inaccurate information to public safety entities, PSWN further notes that the database "would give the regional planning committees (RPC) the ability to choose Interoperability channels that would avoid co-channel and adjacent channel interference on the 700 MHz band of spectrum."[22] In addition, "[t]he obligation to create, initially populate and/or administer this pre-coordination database will not fall to the Commission, the states nor the [RPCs],"[23] according to Powell, who adds that the RPCs will be major users and beneficiaries of such a database.[24] In this connection, we also note that the Public Safety Communications Council (PSCC) "support[s]" the 700 MHz pre-coordination database and is "committed to use [it] for the purposes of pre-coordination . . . ."[25]

9. In reviewing the petitions, we continue to believe it is premature to mandate use of a precoordination database. Moreover, as the Commission stated in the *Fourth R&O*, "we believe the pre-coordination database may have the greatest benefit in planning for the General Use channels, given that we expect to have more applications filed for the General Use channels, and to have more licensees in the General Use channels."[26] In this connection, we note that applicants for General Use channels are likely to propose high-power base stations at specific locations and that such applications must be frequency coordinated. A precoordination database could greatly assist the RPCs in developing the regional plans that must precede the filing of individual applications. Thus, in addressing the petitions, we emphasize that the *Fourth R&O* established rules for the Interoperability channels only, and that it remains unclear "to what extent public safety entities will build infrastructure for use on the Interoperability channels as opposed to using the Interoperability spectrum for mobile-to-mobile communications"[27] that do not require coordination because they are licensed by rule. Furthermore, we note that the petitions do not address the concerns raised in the *Fourth R&O* that mandating the use of a pre-coordination database that is under development could inadvertently delay access to the 700 MHz public safety band.[28] We further note that neither the States nor the RPCs have sought to have the Commission mandate the use of a pre-coordination database. Thus, we are not inclined to change our decision on this matter.

---

[20] PSWN is "a federally funded initiative operating on behalf of all local, state, and federal public safety agencies. The Department of Defense and the Department of the Treasury are jointly leading the PSWN Program's effort to plan and foster interoperability among public safety wireless networks." PSWN Petition at 2, note 3. PSWN has been an active participant in NCC-related meetings and proceedings.

[21] *See* Powell Petition at 5; PSWN Petition at 3-4.

[22] PSWN Petition at 4.

[23] Powell Petition at 5.

[24] *Id.*

[25] *See, e.g.*, WT Docket 96-86, Letter from the Public Safety Communications Council, Al Mello, Chairman, to Marilyn Ward, Chairperson, National Public Safety Telecommunications Council (dated May 24, 2001). The PSCC letters states the position of AASHTO, APCO, FCCA, and IMSA/IAFC (the four FCC-certified public safety coordinators) regarding the pre-coordination database. *Id*. at 1.

[26] *Fourth R&O*, 16 FCC Rcd at 2028 ¶ 19.

[27] *Id.*

[28] *Id*. at 2028 ¶ 18.

10. We nonetheless reiterate our support for development of a pre-coordination database for the 700 MHz public safety band.[29] We note, however, that the commitment of AASHTO, APCO, FCCA, and IMSA/IAFC to use the database may moot any need for the Commission to adopt a requirement. These development issues aside, we do agree conceptually that such a database, once fully functional, could be a useful tool for RPCs. We also believe that use of it as a planning tool would increase the accuracy of the 700 MHz public safety band planning data while facilitating inter-regional coordination. Furthermore, we note that all of the frequency coordinators certified for the 700 MHz public safety band are committed to using the database.[30] Nonetheless, we also note our disinclination to require RPCs to participate in a third-party database if adopting such a requirement would establish the database as the gatekeeper of the General Use spectrum. Put differently, our concept of the pre-coordination database, referenced in the NCC Report and the petitions, anticipates a planning resource that assists each RPC in developing its plan in coordination with other relevant RPCs by providing spectrum-management recommendations and accessible, online data sharing capabilities among RPCs.

B. Secondary Trunking on Eight Interoperability Channels (12.5 kHz systems) and Eight Adjacent Channels (25 kHz systems)

11. In the *Fourth R&O*, the Commission allowed, but did not mandate, trunking on a permissive basis on the Interoperability channels.[31] Further, the Commission concurred with the NCC that to obtain the benefits here, the Commission needs only to allow secondary trunking on a few of the Interoperability channels.[32] The majority of Interoperability channels would remain available for the most likely interoperability communications scenario, *i.e.,* conventional communications on a unit-to-unit basis. To ensure that these Interoperability channels[33] are always available when necessary for conventional interoperability operations, the Commission allowed trunking only on a secondary basis.[34] The Commission also adopted the NCC's recommendation of limiting the number of Interoperability channels that can be used for secondary trunking to eight 12.5 kHz Interoperability channels.[35] To accommodate trunking formats that utilize 25 kHz bandwidth channels,[36] the Commission also designated eight 12.5 kHz Reserve Spectrum channels that were adjacent to the eight Interoperability channels, as secondary trunking channels. Thus, eight of the thirty-two 12.5 kHz Interoperability channels are available for secondary trunking use by trunked systems that utilize 12.5 kHz bandwidth format. For trunked systems in any given area using a 25 kHz bandwidth format, the same eight 12.5 kHz

[29] PSWN indicates that "[t]he National Institute of Justice [a division of the U.S. Department of Justice] has agreed to fund the pre-coordination database. Moreover, the certified Public Safety Frequency Coordinators have agreed to enter and maintain the applicable information in the database as part of the pre-established licensing process. Thus, the obligation to create, populate, and administer the pre-coordination database will note fall to the states, RPCs, or the Commission." PSWN Petition at 4.

[30] *See, e.g.,* WT Docket No. 96-86, Letter from The Public Safety Communications Council Executive, Al Mello, Chairman, to Marilyn Ward, Chairperson, National Public Safety Telecommunications Council (dated May 24, 2001).

[31] *Id* at 2035 ¶ 40.

[32] *Id.* at 2036-37 ¶ 45.

[33] *See* Appendix C *infra.*

[34] *Fourth R&O*, 16 FCC Rcd at 2036 ¶ 42.

[35] *Id.*

[36] 4.8 kilobits per second per 6.25 kHz for narrowband interoperability channels.

Interoperability channels are available along with the eight 12.5 kHz adjacent channels that were redesignated from Reserve Spectrum to secondary trunking.[37]

12. Petitioners Powell and PSWN seek reconsideration of our decision to place all secondary trunking channels in only the bandwidth associated with former Television Channels 63 and 68.[38] They assert that distributing the secondary trunking channels evenly among all four television channels is preferable.[39]

13. We agree with Petitioners that evenly distributing the secondary trunking channels among the four television channels is a practical and flexible approach that maximizes the early availability of at least half of the secondary trunking channels throughout the nation.[40] We note that this action does not change the amount of spectrum dedicated to Interoperability. Accordingly, public safety base stations will operate on frequencies within former Television Channels 63 and 64, paired with mobile units operating on former Television Channels 68 and 69, respectively. However, until the conclusion of the DTV transition period, Television Channel 63 may not be vacated in some regions of the country where Television Channel 64 is vacated and *vice versa*.

C. Guard Channels

14. In the *Fourth R&O,* the Commission declined to designate the 128 channels (6.25 kHz) immediately above and below each 12.5 kHz Interoperability channel as "guard channels" for interference protection purposes.[41] The Commission concluded that the record before it did not sufficiently demonstrate that setting aside guard channels in this context was warranted.[42]

15. Petitioners Powell and PSWN seek reconsideration of the Commission's determination that the band plan adopted in the *Fourth R&O* would not cause harmful interference. PSWN observes that the NCC proposal and the result reached by the Commission are similar, in that they both seek to prevent harmful interference on adjacent channels. PSWN notes that the plan adopted by the Commission accommodates 25 kHz trunked systems and essentially provides guard channels either above or below some Interoperability channel sets. However, PSWN asserts that the NCC plan is superior because it accommodates 25 kHz trunked systems and provides dedicated guard channels above and below each

---

[37] *Id*. at 2036-37 ¶¶ 44 45. The Commission stated that the Reserve Spectrum channels will be designated as secondary trunking channels and may only be used in connection with the adjacent Interoperability 12.5 kHz channel pair in a trunked system. The *Fourth R&O* also specified the specific 6.25 kHz channels that can be combined to form the eight 25 kHz trunked channels.

[38] *Fourth R&*O, 16 FCC Rcd at 2036-37 ¶ 45.

[39] Powell Petition at 6; PSWN Petition at 6.

[40] We are adopting rule revisions in Appendix C to designate certain 6.25 kHz Reserve Spectrum channels as secondary trunking channels that can be combined with adjacent Interoperability channels to form 25 kHz channels.

[41] *Fourth R&O*, 16 FCC Rcd at 2039 ¶ 53.

[42] By way of reference, in adopting service rules for the commercial portion of the 700 MHz band, the Commission established "Guard Bands to protect the immediately adjacent public safety licensees on Channels 63, 64, 68, and 69 from harmful interference from operations on the 30 megahertz segment." Service Rules for the 746-764 and 776-794 MHz Bands, and Revisions to Part 27 of the Commission's Rules, WT Docket No. 99-168, *Memorandum Opinion and Order and Further Notice of Proposed Rulemaking*, 15 FCC Rcd 20845, 20873 ¶ 69 (2000) *citing First Report and Order*, WT Docket No. 99-168, 15 FCC Rcd 476, 490-91 ¶¶ 33-34 (2000). *See also Second Report and Order*, WT Docket No. 99-168, 15 FCC Rcd 5299 (2000).

Interoperability channel set.[43] They note that since the Commission released the *Fourth R&O*, the Telecommunications Industry Association (TIA) has done significant research to show that, if a 6.25 kHz guard channel on either side does not protect the Interoperability channels, then there is the potential for significant interference to Interoperability users from other users on adjacent General Use channels in the same geographic area, and request the Commission to "defer its determination" to consider the TIA Report.[44]

16. We have reviewed the additional information submitted regarding guard channels in the 700 MHz public safety band and find that petitioners have failed to present any argument that was not presented and treated in the *Fourth R&O*. In this connection, we note that in the *Fourth R&O*, the Commission acknowledged that while most commenters generally agreed with the NCC (when it recommended a band plan different than the one presented in the *Third MO&O*), their reasons were more for adopting any band plan where aggregation to 25 kHz operations could occur, as opposed to protecting against adjacent channel interference.

17. We also note that the TIA Report upon which Petitioners rely is distinguishable, in that it studies commercial 700 MHz band interference with public safety systems, and not public safety General Use interference with public safety Interoperability use. Other technical information provided with the petitions appears to be merely a recitation of the Commission's Rules with graphs and charts providing a pictorial of the adjacent channel coupled power (ACCP) rules.[45] Moreover, although we recognize that the location of every incident requiring interoperability communication cannot be predicted or planned, the Petitioners' technical data is based on an assumption that there will be no geographical separation between the adjacent channel operations. The Petitioners' technical data also appears to assume that if operation on one Interoperability channel is impaired, by adjacent channel operations, then all thirty-two Interoperability channels will be so impaired. In sum, we find the Petitioners' contentions unpersuasive. We agree that their approach would reduce interference, but the Petitioners do not balance this benefit against the loss of 0.8 megahertz of spectrum that would be sacrificed for use merely as 6.25 kHz "spacers," instead of for services to protect the safety of life, health, and property. Additionally, we believe that appropriate design planning should be a sufficient mechanism for minimizing the adjacent channel interference potential in the 700 MHz public safety band. Based on the information before us, we conclude that Petitioners have not established a record sufficient for us to reverse our prior decision on this matter and double the amount of spectrum designated for interoperability purposes.

D. Access Priority

18. In its Report, the NCC recommended that the Commission adopt a priority scheme for the use of Interoperability channels.[46] Specifically, it urged that a party wishing to use an Interoperability channel in use by another party would declare its level of priority. The higher level of priority would gain

[43] Powell Petition at 6; PSWN Petition at 6.

[44] Powell Petition at 7; PSWN Petition at 7. *See also* Protection of Public Safety Systems From 700 MHz CMRS Band Interference, Telecommunications Industry Association (TIA Report) (February 20, 2001).

[45] Powell Petition, Exhibits 1 and 2. On August 23, 2001, the Telecommunications Industry Association submitted industry consensus recommendations regarding adjacent channel coupled power (ACCP) requirements for transmitters, 47 C.F.R. § 90.543. The recommendations were in response to the Commission's request that the industry "review this technical issue and provide [the Commission], . . . , consensus recommendations for values of ACCP emissions limits." The Development of Operational, Technical and Spectrum Requirements for Meeting Federal, State, and Local Public Safety Agency Communications Requirements Through theYear 2010, WT Docket 96-86, *Second Memorandum Opinion and Order,* 15 FCC Rcd 16844, 16853 ¶ 16 (2000). The Commission anticipates addressing those recommendations in the near future.

[46] NCC Report at 14 ¶ 44.

use of the channel, and the party with the lower priority level would be required to cease its communication immediately.[47] In the *Fourth R&O*, the Commission adopted the position initially expressed in the *Fourth Notice*, that, while finding merit in a priority access scheme, the Commission was not persuaded that such a scheme should be codified in our Rules.[48] Specifically, the Commission believed that the states were in a better position to determine priority use and resolve disputes, and noted that the priority levels the NCC recommended differed from the Priority Access Service (PAS) levels the Commission adopted to allow commercial mobile radio service (CMRS) providers to provide PAS for national security and emergency preparedness (NSEP) personnel.[49]

19. Petitioners Powell and PSWN have asked that the Commission reconsider its rejection of a nationwide, codified access priority scheme.[50] Powell suggests that the Commission "look to the overall NCC objective of a nationwide access system,"[51] and asserts that "there are simply some nationwide requirements that must be codified," including access priority.[52] In its Petition, PSWN "disagrees with the Commission's belief that states are in a far superior position to devise, coordinate, and operate an appropriate access formula in the event of a [*sic*] emergency situation,"[53] and posits that "the goal of nationwide Interoperability at all levels of governments will be best served with the implementation" of codified access priority rules.

20. In the *Fourth R&O*, the Commission noted that access priority levels are determined as part of a state-level plan,[54] *i.e.*, access priority is one component of administration of the interoperability channels. In this connection, the Commission also determined in the *Fourth R&O* that states or state-level agencies are the most appropriate entities to plan and administer the Interoperability spectrum. Thus, in considering the petitions, we first note that no state nor state-level agency seeks reconsideration of the Access Priority decision in the *Fourth R&O*, whereas several states and state-level agencies strongly rejected a required, Federal Access Priority formula in comments to the *Fourth NPRM*. Next, it is instructive that the NCC and most commenters recommended that administration of the interoperability channels occur at the state-level, if at all possible. Indeed, a recent PSWN study recommends state-level administration[55] and we are concerned about Federal intrusion into an area that state and local entities

---

[47] *Id.; see also* NCC Report, Appendix D, *Voice Channel Priority Recommendations.*

[48] *Fourth R&O,* 16 FCC Rcd at 2042 ¶ 64, *citing Fourth Notice,* 15 FCC Rcd at 16907 ¶ 37.

[49] *See* 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, *Second Report and Order*, 15 FCC Rcd 16720, 16721 (2000). The Commission determined that, should a commercial mobile radio service provider choose to offer PAS, the Commission would require them to "adhere to uniform operating protocols concerning the number of priority levels and the priority level for particular NSEP user." *Id.* at 16722 ¶ 4.

[50] Powell Petition at 9-11; PSWN Petition at 5-6.

[51] Powell Petition at 9 (footnote omitted).

[52] *Id.* at 11.

[53] PSWN Petition at 6.

[54] *Fourth R&O,* 16 FCC Rcd at 2042 ¶ 63.

[55] "[T]he single most critical element [for enhancing interoperability] is the idea of bringing together decision-makers from several governmental sectors, with ultimate authority derived from the executive power of the state." *See* PSWN Program, *SIECs: States' Most Effective Tool For Coordinating Interoperability, Washington State Case Study and Best Practices Guide*, at 2 § 1.3 (October 8, 2001).

have handled well.[56] Additionally, as noted in the *Fourth R&O*, the access priority levels that the NCC recommended for the interoperability channels differ from the PAS levels that the Commission adopted in rules allowing CMRS providers to provide PAS for NSEP personnel. We remain concerned that creating yet "another set of priority levels would serve only to create confusion during a large-scale or multi-agency response."[57] Thus, based on the information before us, it is premature to adopt a rigid access priority regime for the 700 MHz band. Accordingly, we will not reconsider our decision at this time, but will monitor implementation of systems to see if problems develop.

E. Channel Designation

21. In the *Fourth R&O*, the Commission declined to adopt a table of channel assignments, agreeing with the majority of commenters who, while generally supportive of channel designation, expressed concern about codifying the NCC recommendation.[58]

22. Petitioners Powell and PSWN suggest that, in failing to adopt a table of channel assignments, the Commission misunderstood the NCC's recommendation regarding channel designation, suggesting that "a definitive table of assignments was not the intent of the NCC, rather the intent was to provide a baseline for personnel managing emergency responses during the first critical minutes of a developing incident."[59] PSWN states that it "does not believe that the NCC has proposed to recommend a definitive table of service-specific assignments,"[60] while Powell notes the benefits of specific channel designation, such as allowing same-service officers to respond to a call, regardless of jurisdiction.[61]

23. Our review of the NCC Report does not indicate that the recommendation from the NCC Interoperability Subcommittee was merely a suggestion. "The Interoperability Subcommittee's proposed access priority standards are taken from the PSWAC Report, ... T]he [NCC] Steering Committee recommends that the Commission incorporates the standards into its rules."[62] Read in the context of the NCC Report, then, we believe the proffered table of channel assignments was, in fact, a request to codify that table.[63] Moreover, if, as petitioners suggest, the NCC intended its recommendation as mere

[56] PSWN advises that "even federal entities are generally subject to state law for activities entirely within that state's borders unless the Congress chooses to preempt that right specifically and for a clearly defined purpose." *Id.* at 8 § 2.5.

[57] *Fourth R&O,* 16 FCC Rcd at 2042 ¶ 64.

[58] *Id.* at 2039 ¶ 55, "Florida, for example, while noting that such a designation 'has considerable value to the effective and cooperative use' of mutual aid channels, expressed concern about 'the degree of specificity and exclusiveness incorporated in the NCC-recommend (*sic*) naming and use designation . . . .' For their part, the Joint Commenters asserted that adoption of a table of assignments would be Federal micro-management of a local issue, resulting in the deprivation of the states' flexibility to address local situations." (Footnotes omitted).

[59] PSWN Petition at 7; *see also* Powell Petition at 7, "as chair of the Interoperability Subcommittee throughout this discussion within the NCC, I can assure the Commission that a hard and fast table was not the intent of the NCC, rather the intent was to provide a 'first place to go' for fast breaking operations of the primary emergency responders . . . during the first critical minutes of a developing incident."

[60] PSWN Petition at 8.

[61] Powell Petition at 8, "Of critical importance to [channel designation], the initiating officer need not be a local officer or even an officer from that state; a call for assistance could go out immediately on the law enforcement channel with some hope of getting an immediate response from a law enforcement agency because the channels are standardized across the nation."

[62] NCC Report at 15 (footnote omitted).

[63] *Id.*; s*ee also* NCC Report, Appendix D.

guidelines, they do not explain how this would support codifying them as rules. We note that the Commission cannot practically adopt a recommendation it cannot enforce. It can enforce a recommendation that has been adopted as a rule. Further, we ask who would be responsible for maintaining any such table, and note the practical difficulties of administering such a table (*e.g.*, were such a table to be codified, even a minor change to the table would entail notice and comment rulemaking). In addition, we note that the Commission, through establishing nationwide Interoperability channels, designating two Interoperability calling channels, and devoting two channels exclusively to data transmission, attains some of the same benefits that the Petitioners contend channel designation would bring. Petitioners, however, have not demonstrated how mandating channel designation outweighs the inherent inflexibility and burden to local public safety officials; thus, we decline to grant their petition. At the same time, we acknowledge the value of the NCC Interoperability Subcommittee's deliberations and agree with the petitioners' that providing the public safety community with the NCC's "default designation" would serve the public interest. Accordingly, the Commission stands ready to assist in disseminating any NCC "default designation" recommendations to the public safety community.

F. Interoperability Channel Capability Requirement

1. Timeframe for Interoperability Capability

24. In the *Fourth R&O*, the Commission adopted the Project 25 Phase I standard as the digital voice standard for the Interoperability channels. The Commission noted that most commenters supported the Project 25 Phase I standard,[64] and concluded that adopting this standard would further the goal of providing public safety entities access to the Interoperability channels on a near-term basis in a cost-effective manner.[65] The Commission noted its desire to promote the immediate "development and deployment of 700 MHz band public safety equipment or the planning and construction of public safety systems in this band."[66] The Commission decision was based on its long-held belief that "interoperability signifies the crowning achievement of this proceeding."[67]

25. In its petition for reconsideration, the North America TETRA Forum ("NATF") did not retract its acceptance (first expressed in its comments to the *Fourth Notice*)[68] of Project 25 Phase I as the digital voice standard for the Interoperability channels. Rather, it avers that the Commission erred by failing to establish a reasonable transition period before Interoperability capability becomes mandatory for all 700 MHz band public safety equipment.[69] In this connection, NATF avers that the Commission may have violated the Administrative Procedure Act "[b]ecause the Commission did not address the significant number of comments in the record regarding the need for a transition period before Phase I

---

[64] *See Fourth R&*O, 16 FCC Rcd at 2044 ¶ 70; *See also Comments to Fourth Notice* - North America TETRA Forum Comments at 10-11 (supported adoption of standard on a short-term basis); Nokia Comments at 6; Com-Net Ericsson Comments at 15; Orange County Comments at 4; E.F. Johnson Comments at 2; Ronald J. Gillory (Gillory) Comments at 1; Buchanan Comments at 5; Mesa Comments at 7; Kenwood Comments at 11; NCC Comments at 17; Florida Comments at 5; APCO Comments at 4; IACP Comments at 2; Motorola Comments at 4; FLEWUG Comments at 3; PSWN Comments at 9**;** Project 25 Steering Committee Comments at 3.

[65] *Fourth Notice*, 15 FCC Rcd at 16918 ¶ 46.

[66] *Fourth R&O* 16 FCC Rcd at 2048 ¶ 78.

[67] *First Report and Third Notice*, 14 FCC Rcd. at 156 ¶ 7.

[68] NATF Comments to *Fourth Notice* at 6, "NATF agrees with the Commission's recommendation of using Project 25, Phase I for Interoperability Channels with the one voice per 12.5 kHz of bandwidth."

[69] NATF Petition at 2. NATF contends that the Commission should have provided a "transition" period before the interoperability capability requirement becomes effective. *Id.*

capability becomes mandatory, ..."[70] Furthermore, NATF asserts that the Commission's approach stifles competition and improperly favors Motorola by, in effect, giving that equipment manufacturer a five-year "head start" over other manufacturers.[71] Specifically, NATF contends that we must grant a transition period until 2006, during which time non-interoperable equipment could be type certified and used, because:

> manufacturers of 6.25 kHz equipment need a transition period before Phase I capability becomes mandatory in order to have the time to develop dual mode handsets.[72]

For this reason, according to NATF, the Commission should grant a transition period until 2006 during which period public safety users can deploy 6.25 kHz spectrally efficient technology without Project 25 Phase I interoperability capability.[73] To do otherwise, it suggests, would be to "sacrifice competition and spectrum efficiency, in favor of realizing Interoperability six years before the earliest date implementation will become a practical necessity."[74]

26. In disagreeing with NATF, the Association of Public-Safety Communications Officials International ("APCO") notes that "[l]icensees may still operate using any technology they wish on the General Use portion of the [700 MHz public safety] band (including TETRA),[75] but they must be able to communicate using Project 25 Phase I standard on the Interoperability channels. Without that standard, there is no Interoperability."[76] Furthermore, APCO contends,

> [t]he TETRA Forum claims that they will not be able to produce TETRA equipment with the Project 25 Phase I standard mode for Interoperability channel use until 2006. Therefore, for no apparent reason other than to prevent other manufacturers from obtaining a "head start," TETRA Forum asks the Commission to establish a "transition period" during which equipment could be marketed for use in the 700 MHz public safety band even though it does not have the capability to operate in the Interoperability mode.[77]

27. We do not believe that NATF's claim concerning the need for a transition period until 2006 before Interoperability equipment should be required is consistent with one of the fundamental goals of this proceeding. The goal of Interoperability was the starting point of this proceeding and public discourse that the Commission has encouraged. Specifically, to provide formality to the NCC and to ensure participation by representatives of all elements of the public safety community, we chartered the

---

[70] *Id.* at 8.

[71] *Id*. at 6.

[72] *Id*. at 4-5.

[73] *Id.* at 7.

[74] *Id*. at 9.

[75] TETRA, the European Technical Standards Institute 392 TErrestrial Trunked Radio (TETRA) system, is a four-slot Time Division Multiple Access (TDMA) standard in which four voice channels are realized with a 25 kHz bandwidth. *See, e.g.*, NCC Report at 17 ¶ 51.

[76] APCO Response to Petitions for Reconsideration at 3.

[77] *Id.*

NCC pursuant to the Federal Advisory Committee Act[78] and required the NCC's technical-standard recommendations to be ANSI accredited.[79] Furthermore, as APCO points out, our rules do not preclude type certification of TETRA equipment so long as it is capable of interoperability on the narrowband Interoperability channels. Rather, each potential manufacturer of 700 MHz band public safety equipment is governed by its own business plan and judgment and we decline to adopt an arbitrary transition period merely to accommodate the business plans of some TETRA manufacturers.

28. The interoperability capability requirement provides an equal incentive for all potential equipment manufacturers to produce compliant equipment at the earliest possible time. NATF provides no basis for delaying the public safety community's access to interoperable 700 MHz band public safety equipment. We are concerned that granting NATF's request would allow manufacturers to populate the 700 MHz public safety band with non-interoperable equipment, thereby contradicting one of the primary goals of implementation of the 700 MHz public safety band spectrum.[80]

29. In addition, we find that NATF's Administrative Procedure Act claim is not persuasive. Back in 1998, the Commission adopted the interoperability capability requirement, signaling that "all narrowband mobile and portable 700 MHz public safety band radios [must] be capable of operating on all of the narrowband nationwide Interoperability channels."[81] The only question remaining was which standard the Commission would adopt. As soon as the Commission made that decision in *Fourth R&O*, the interoperability capability requirement became effective henceforth. In other words, industry has known since 1998 that the Commission has an Interoperability capability requirement; the only remaining question related to which standard the Commission would adopt for immediate implementation. We note that Nokia did not file a petition for reconsideration of our 1998 decision regarding the interoperability capability requirement. Had Nokia been concerned about a transition period to whatever standard the Commission adopted for the Interoperability channels, Nokia should have raised that issue, forcefully,

---

[78] *See* Federal Advisory Committee Act, 5 U.S.C. App. 2 (1988). The Commission cosponsored the NCC along with the United States Department of Justice, the National Telecommunications and Information Agency, the United States Treasury Department, the Federal Emergency Management Agency.

[79] The American National Standards Institute (ANSI), describes itself as a private sector organization that, among other things, serves as the policy forum for the U.S. standards and conformity assessment communities, accredits domestic standards developers, approves standards as American National Standards, and safeguards the integrity and value of the American National Standard designation by requiring due process, balance of interests, consensus and openness to all directly and materially affected interests in the private and public sectors. *See Memorandum Opinion and Order on Reconsideration*, 14 FCC Rcd 8059, 8064 ¶ 8 (1999). The Commission clarified that the NCC could either become ANSI-accredited or make use of the work of existing ANSI-accredited Standards Developers. *Id* at 8065 ¶ 11.

[80] As noted, "[i]nteroperability signifies the crowning achievement of this proceeding." *First Report and Third Notice*, 14 FCC Rcd at 156 ¶ 7. *See also* Dataradio Corporation, *Order*, 15 FCC Rcd 22283 (WTB/PSPWD 2000) recon. denied, *Order on Reconsideration*, DA 01-2843 (WTB, rel. Dec. 10, 2001), which denied petitioner's request to be allowed to manufacture narrowband mobile and portable transmitters incapable of operating on the narrowband Interoperability channels. The Public Safety and Private Wireless Division (Division) of the Commission's Wireless Telecommunications Bureau based its decision, *inter alia*, out of concern that public safety entities that purchase non-interoperability capable equipment "will be reluctant, perhaps financially unable, to buy radios that comply with the 700 MHz interoperability standards," thereby jeopardizing the Commission's overall interoperability plan. *Id.* at 22287 ¶ 11 (footnote omitted). The Division also noted that in adopting Section 90.547, the Commission "foreclosed users from the option to elect whether or not to purchase 700 MHz radios without interoperability capability." *Id.* at ¶ 9.

[81] 47 C.F.R. § 90.547 (1998). The record reflects that NATF raised issues during the *Fourth Notice* comment period that might have been more timely presented several years earlier. In this connection, NATF's comments were not responsive to the issues raised in the *Fourth Notice*, and instead, sought to re-open matters decided several years earlier.

since 1998. Moreover, type certification for all narrowband equipment was deferred pending the adoption of a digital voice standard for Interoperability channels, which is precisely why the Interoperability standard became effective as soon as possible after adoption in January 2001. Whichever Interoperability standard was adopted would become effective immediately so that public safety entities could use the 700 MHz band where it was unencumbered by broadcast television stations.[82] By comparison, the Commission elected not to adopt a standard for the General Use channels in the *Fourth R&O* after noting that the *Fourth Notice* did not address this subject.[83]

2. Com-Net Ericsson - Petition for Declaratory Ruling

30. On May 10, 2001, Com-Net Ericsson[84] filed a *Petition for Declaratory Ruling* believing that Section 90.547 of the Commission's Rules, as promulgated in the *Fourth R&O,* does not adequately reflect the Commission's intent.[85] Specifically, Com-Net Ericsson asserts that the wording of the rule contradicts the language of the rule preamble. In the preamble to the rule, the Commission stated, "[f]inally, we adopt our proposal that end user equipment designed for data is not required to be voice-capable. Further, end user equipment designed for voice is not required to be data capable."[86]

31. Com-Net Ericsson suggests that the wording of the rule is less clear than the language in the preamble, where the Commission made clear that voice-capable equipment need not be data-capable, and data-capable equipment need not be voice-capable. We believe that Com-Net Ericsson has correctly pointed out a potential source of conflict or confusion in reading this rule provision. Therefore, on our own motion, we will amend Section 90.547 to reflect our intention as reflected in the preamble of the *Fourth R&O.* We will also revise the rule to clarify that equipment that operates only on 700 MHz public safety wideband channels is not subject to the narrowband interoperability capability requirements of Section 90.547.

G. Other Matters

1. Section 90.548, Interoperability technical standards

32. Motorola seeks clarification of Section 90.548 (a)(ii). Motorola contends that the rule as published in the *Federal Register*[87] requires data devices to conform to both the packet data and the

---

[82] *Fourth R&O*, 16 FCC Rcd at 2044 ¶ 70. Having determined in 1998 that radios working in the 700 MHz Public Safety band must be interoperability-capable, the question then became, which technology standard ought the Commission adopt? The *Fourth R&O* resolved this question and we do not believe it is prudent or in the public interest to delay realization of interoperability, where available, any longer.

[83] *Id.* at 2048 ¶ 79.

[84] On May 22, 2001, the Commission received a letter informing it that "Com-Net Ericsson Critical Radio Systems, Inc. was acquired by a parent holding company of Tyco International, Ltd., a Fortune 500 company. The entity that formerly operated under the name Com-Net Ericsson Critical Radio Systems, Inc. will now be operating under the name M/A-COM Private Radio Systems, Inc." For purposes of this Memorandum Opinion and Order, we shall continue to refer to Com-Net Ericsson, as that is the name the company operated under when it initially filed its petition.

[85] *See* Com-Net Ericsson Petition for Declaratory Ruling at 5. On May 24, 2001, Com-Net Ericsson filed a copy of this pleading in the captioned docket (for informational purposes). *See* May 24, 2001, Letter from Robert J. Speidel, Com-Net Ericsson, to Secretary, FCC. In a separate May 24, 2001, letter, Com-Net Ericsson modified its Petition.

[86] *Fourth R&O*, 16 FCC Rcd at 2052 ¶ 90.

[87] 66 Fed. Reg. 10632, 10636 (February 16, 2001).

circuit data descriptions.[88] Motorola believes that requiring manufacturers to support both formats within a single device will prohibit manufacturers from introducing any compliant data technologies on the narrowband Interoperability channels.[89] Motorola appears to suggest that by adding the word, "or" between the two formats, the problem will be eliminated, as manufacturers can adopt one or the other protocol.[90]

33. In general support of Motorola's request for clarification, Com-Net Ericsson believes that by adding "or" and deleting the semicolon between the packet data and the circuit data specifications, the Commission eliminates the apparent requirement to incorporate two different data formats in order to comply with Section 90.548.[91] Yet, Com-Net Ericsson points out that such a change would allow a *manufacturer*, as opposed to the Commission, to determine which format to incorporate in its radios, regardless of what the users and other manufacturers decide is optimal for operations on the narrowband data Interoperability channels. According to Com-Net, the possibility exists that fully compliant radios made by different manufacturers might not be able to communicate with each other on the narrowband data Interoperability channels.

34. On June 6, 2001, the NCC recommended that the Commission delete reference to circuit data specification and adopt packet data specifications exclusively.[92] The NCC noted that,

> "packet data is now so ubiquitous in the industry that there no longer is any need for, indeed any conceivable use for, circuit data capability in a 700 MHz public safety radio. Thus, requiring both circuit data and packet data capability in a radio – as a literal reading of the [] rule may suggest – would serve only to add to the cost, complexity and size of the radio, all to no purpose."[93]

35. For the reasons set forth above, we agree that the rule should be clarified so that reference to circuit data capability is deleted. This action will promote interoperability, and lessen cost, confusion and potential inefficiency among manufacturers of 700 MHz public safety band radio equipment.

2. Section 90.553, Encryption

36. On January 23, 2001, the American National Standards Institute (ANSI) published the Project 25 DES encryption standards.[94] Our rules will be amended to note this change, from interim standards (IS) to permanent ANSI standards.

3. Section 90.531, Band plan

37. We are taking this opportunity to correct minor publication errors, including Section 90.531(c)(1), wideband interoperability channels. The Commission intended to designate wideband

---

[88] Motorola Request for Clarification at 3.

[89] *Id.*

[90] *Id.* at 4.

[91] Com-Net Ericsson response to Motorola Request for Clarification at 1.

[92] June 6, 2001, Letter from NCC Chair Kathleen Wallman.

[93] *Id.*

[94] ANSI/TIA/EIA 102.AAAA-A-2001

channels 82-84 for nationwide interoperability licensing and use[95] but the current rule refers to wideband channels 83-84. We will also revise the rule to clarify that wideband interoperability channels will be available for licensing and use after the Commission adopts a wideband interoperability standard.

38. We also are correcting Section 90.531(d), Combining channels. Through an inadvertent oversight, it now appears that Section 90.531(d)(1) and (2) were deleted from the rules. We are hereby restoring (1) and (2), with minor corrections.

V. PROCEDURAL MATTERS

A. Regulatory Flexibility Act

39. Appendix A contains a Supplemental Final Regulatory Flexibility Analysis (SFRFA) with respect to the *Fourth Memorandum Opinion and Order*. As required by the Regulatory Flexibility Act,[96] the Commission has prepared the analysis of the possible impact on small entities of the rules set forth in this document. The Commission's Consumer Information Bureau, Reference Information Center, will send a copy of this *Fourth Memorandum Opinion and Order*, including the SFRFA, to the Chief Counsel for Advocacy of the Small Business Administration in accordance with the Regulatory Flexibility Act.

B. Paperwork Reduction Act

40. This *Memorandum Opinion and Order* does not contain any new or modified information collection. Therefore, it is not subject to the requirements for a paperwork reduction analysis, and the Commission has not performed one.

VI. ORDERING CLAUSES

41. Authority for the issuance of this *Fourth Memorandum Opinion and Order* is contained in Sections 4(i), 4(j), 7(a), 302, 303(b), 303(f), 303(g), 303(r), 307(e), 332(a), and 332(c) of the Communications Act of 1934, as amended, 47 U.S.C. §§ 154(i), 154(j), 157(a), 302, 303(b), 303(f), 303(g), 303(r), 307(e), 332(a), 332(c).

42. Accordingly, IT IS ORDERED that Part 90 of the Commission's Rules, 47 C.F.R. Part 90 IS AMENDED as specified in Appendix C.

43. IT IS FURTHER ORDERED that this *Fourth Memorandum Opinion and Order* will be effective thirty days after publication in the Federal Register.

44. IT IS FURTHER ORDERED that the Commission's Consumer Information Bureau, Reference Information Center, SHALL SEND a copy of this *Fourth Memorandum Opinion and Order,* including the Supplemental Final Regulatory Flexibility Analysis, to the Chief Counsel for Advocacy of the Small Business Administration.

45. IT IS FURTHER ORDERED pursuant to Section 4(i) and 405 of the Communications Act of 1934, as amended, 47 U.S.C. §§ 154(i), 405, and Section 1.429(i) of the Commission's Rules, 47 C.F.R. § 1.429(i), that the petitions for reconsideration, clarification, and/or a declaratory ruling filed by Motorola, the North America TETRA Forum, Sergeant John S. Powell, the Public Safety Wireless

[95] Development of Operational, Technical and Spectrum Requirements for Meeting Federal, State and Local Public Safety Agency Communications Requirements Through the Year 2010, WT Docket No. 96-86, *Third Memorandum Opinion and Order and Third Report and Order*, 15 FCC Rcd 19844, 19857 ¶ 32 (2000).

[96] *See* 5 U.S.C. § 601, *et seq.*

Network, Com-Net Ericsson Critical Radio Systems, Inc. ARE GRANTED to the extent indicated herein and otherwise ARE DENIED.

FEDERAL COMMUNICATIONS COMMISSION

William F. Caton
Acting Secretary

APPENDIX A

Supplemental Final Regulatory Flexibility Analysis

As required by the Regulatory Flexibility Act of 1980, as amended (RFA),[1] a Final Regulatory Flexibility Analysis (FRFA) was incorporated into the *Fourth Report and Order and Fifth Notice of Proposed Rule Making (Fourth R&O and Fifth NPRM)*[2] of this proceeding. The Commission sought written public comment on the proposals in the *Fifth NPRM*, including comment on the IRFA.[3] The present Supplemental Final Regulatory Flexibility Analysis (SFRFA) conforms to the RFA.[4]

A. Need for, and Objectives of, the *Fourth Memorandum Opinion and Order*:

Our objective is to promote the early and efficient use of public safety spectrum in the frequencies at 764-776 MHz and 794-806 MHz (the 700 MHz band). Specifically, this action will: promote spectrum efficiency through allowing secondary trunking on the Interoperability channels; promote efficient administration of the Interoperability channels by state or local entities; permit encryption on the Interoperability channels; and establish digital voice standards and efficiency standards for the Interoperability channels.

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

No comments were submitted in response to the IRFA.

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

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.[5] The RFA generally defines "small entity" as having the same meaning as the terms "small business," "small organization," and "small governmental jurisdiction."[6] In addition, the term "small business" has the same meaning as "small business concern" under the Small Business Act.[7] A small business concern is one which : (1) is independently owned and operated; (2) is not dominant in its field of operations; and (3) satisfies any additional criteria established by the Small Business Administration (SBA).[8] A small organization is

---

[1] *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).

[2] 16 FCC Rcd 2020, 2060 (2001).

[3] *Id*.

[4] *See* 5 U.S.C. § 604.

[5] 5 U.S.C. § 603(b)(3).

[6] 5 U.S.C. § 601(6).

[7] 5 U.S.C. § 601(3) (incorporating by reference the definition "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 terms which are appropriate to the activities of the agency and publishes such definition(s) in the Federal Register." 5 U.S.C. § 601(3).

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

generally "any not-for-profit enterprise which is independently owned and operated and is not dominant in its field.[9] Nationwide, as of 1992, there were approximately 275,801 small organizations.[10] "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."[11] As of 1992, there were approximately 85,006 such jurisdictions in the United States.[12] This number includes 38,978 counties, cities, and towns; of these, 37,566, or ninety-six percent, have populations of fewer than 50,000.[13] 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 (ninety-one percent) are small entities.

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.[14] 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. All governmental entities with populations of less than 50,000 fall within the definition of a small entity.[15]

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.[16] 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

[9] 5 U.S.C. § 601(4).

[10] 1992 Economic Census, U.S. Bureau of the Census, Table 6 (special tabulation of data under contract to Office of Advocacy of the SBA).

[11] 5 U.S.C. § 601(5).

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

[13] *Id*.

[14] *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.

[15] 5 U.S.C. § 601(5).

[16] 13 C.F.R. § 121.201, Standard Industrial Code (SIC) 3663.

entities.[17] 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, two of the six manufacturers, are major, nationwide radio equipment manufacturers, and, thus, we conclude that these manufacturers would *not* qualify as small businesses.

Television Stations. This proceeding will affect full service TV station licensees (Channels 60-69), TV translator facilities, and low power TV (LPTV) stations. The SBA defines a TV broadcasting station that has no more than $10.5 million in annual receipts as a small business.[18] TV broadcasting stations consist of establishments primarily engaged in broadcasting visual programs by TV to the public, except cable and other pay TV services.[19] Included in this industry are commercial, religious, educational, and other TV stations.[20] Also included are establishments primarily engaged in TV broadcasting and which produce taped TV program materials.[21] Separate establishments primarily engaged in producing taped TV program materials are classified under another NAICS Code.[22]

There were 1,509 TV stations operating in the nation in 1992.[23] 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.[24] For 1992[25] 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.[26] There are currently 95 full service analog TV stations, either operating or with approved construction permits on

---

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

[18] 13 C.F.R. § 121.201, SIC 4833 (1996).

[19] 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).

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

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

[22] ESA 1992 Census at Appendix A-9; NAICS Code 51211 (Motion Picture and Video Tape Production); NAICS Codes 51229, 53249, 56131, 71111, 71112, 71132, 71141m 71151, 561399 (Theatrical Producers and Miscellaneous Theatrical Services (producers of live radio and TV programs)).

[23] *Allocation Report and Order*, 12 FCC Rcd at 22953 (1998), at Appendix C; ESA 1992 Census at Appendix A-9.

[24] *Allocation Report and Order*, 12 FCC Rcd 22953 (1998) at Appendix C.

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

[26] 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 is possible to calculate with the available information.

channels 60-69.[27] In the *DTV Proceeding*, we adopted a DTV Table that provides only 15 allotments for DTV stations on channels 60-69 in the continental United States.[28] There are seven DTV allotments in channels 60-69 outside the continental United States.[29] Thus, the rules will affect approximately 117 TV stations; approximately 90 of those stations may be considered small businesses.[30] 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 2000, minorities owned and controlled 23 (1.9 percent) of 1,288 full power commercial TV stations in the United States.[31] 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.[32]

There are currently 4,977 TV translator stations and 1,952 LPTV stations.[33] Approximately 1,309 low power TV and TV translator stations are on channels 60-69[34] 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.

---

[27] *See Allocation Notice*, 12 FCC Rcd at 14142.

[28] See DTV Proceeding, 12 FCC Rcd 14588.

[29] *See Allocation Notice* 12 FCC Rcd 14142, n.5.

[30] 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.

[31] *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") (Dec. 2000). 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.

[32] *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 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).

[33] *See Allocation Report and Order*, 12 FCC Rcd 22986 at Appendix C.

[34] *See Allocation Notice* at 12 FCC Rcd 14142, n.3.

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

The *Fourth Memorandum Opinion and Order* does not adopt rules that will entail reporting, recordkeeping, and/or third-party consultation.

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

The RFA requires an agency to describe any significant alternatives that it has considered in reaching its proposed approach, which may include the following four alternatives (among others): (1) the establishment of differing compliance or reporting requirements or timetables that take into account the resources available to small entities; (2) the clarification, consolidation, or simplification of compliance or reporting requirements under the rule for small entities; (3) the use of performance, rather than design, standards; and (4) an exemption from coverage of the rule, or any part thereof, for small entities. 5 U.S.C. §603.

The NCC, comprised of representatives from government, the public safety community, and the communications equipment manufacturing industry, was chartered by the FCC as a Federal Advisory Committee, effective February 25, 1999. The NCC made recommendations concerning various issues addressed in the *Fourth Notice***.** We note that in several instances, to benefit all entities, including small entities, we did not propose a particular recommendation.

In formulating the rules in the *Fourth Memorandum Opinion and Order*, we reduced economic burdens wherever possible. The regulatory burdens that we have adopted are necessary to ensure that the public receives the public safety benefits of innovative new services in a prompt and efficient manner. For example, we have adopted technical and operational rules that will promote competition in the equipment market. We believe that the rules must be as competitively and technologically neutral as possible, in order to allow for competing equipment designs and to avoid hindering future innovative technological developments. We note that tighter technical specifications generally allow more intense spectrum use, but may result in higher equipment costs. Conversely, although wider tolerances may allow manufacturers to use less costly component parts in transmitting equipment, they also may result in less efficient spectrum use. With these considerations in mind, we believe that the technical regulations we adopt herein provide a reasonable balance of these concerns.

Under the regional planning process, frequency coordination is competitive. Frequency coordination is the process by which a private organization recommends to the Commission the most appropriate frequencies for private land mobile radio service applicants.[35] Frequency coordinators provide a valuable service to the Commission by eliminating common application errors, thereby improving the quality of the applications and resolving potential interference problems at the source. We continue to believe that the encouragement of competition among coordinators promotes cost-based pricing of coordination services and provides incentives for enhancing service quality. Therefore, we will continue to allow any of the certified public safety coordinators to provide coordination in the 700 MHz band.

Recognizing the budgetary constraints that public safety entities face as a matter of course, we have adopted rules that encourage broad-based efforts, such as projects on the state and regional level, to coordinate and consolidate operations that are critical to meeting the needs of public safety with cost effective, spectrally-efficient radio systems. For example, we have adopted permissive trunking on certain public safety channels in the 700 MHz band. Trunked systems provide service to many governmental entities in a specific geographic area and offer a higher degree of efficiency than some smaller, non-trunked systems. A difficulty in establishing these types of shared systems is that they require individual agencies to

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

surrender some autonomy in return for the efficiencies and better coverage of a larger system. 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. For these, and other, reasons, we encourage the use of shared systems in the public safety community.[36]

Report to Congress: The Commission will send a copy of the *Fourth Memorandum Opinion and Order*, including this SFRFA, in a report to be sent to Congress pursuant to the SBREFA, *see* 5 U.S.C. § 801(a)(1)(A). In addition, the commission will send a copy of the *Fourth Memorandum Opinion and Order* to the Chief Counsel for Advocacy of the Small Business Administration. In addition, the *Fourth Memorandum Opinion and Order* and SFRFA (or summaries thereof) will be published in the Federal Register. *See* 5 U.S.C. § 604(b).

[36] Area-wide licenses often encourage the rapid development and deployment of innovative services and 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).

APPENDIX B

LIST OF PARTIES

Petitions for Reconsideration and/or Clarification were filed by:

Motorola
North America TETRA Forum
Sergeant John S. Powell
Public Safety Wireless Network

Oppositions and Replies to Petitions for Reconsideration were filed by:

Association of Public-Safety Communications Officials, International
Com-Net Ericsson Critical Radio Systems, Inc.
Marconi Wireless
Nokia Inc.
Simoco Digital Systems

Petition for Declaratory Ruling was filed by:

Com-Net Ericsson Critical Radio Systems, Inc.

APPENDIX C

FINAL RULES

Fourth Memorandum Opinion and Order

Part 90 of Title 47 of the Code of Federal Regulations is amended as follow:

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

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

2. Section 90.531 is revised to read as follows:

§ 90.531 Band plan.

* * * * *

(b)(1) * * *

* * * * *

(iii) *Narrowband trunking Interoperability channels*. The following Interoperability channel pairs may be combined with the appropriate adjacent secondary trunking channel pairs and used in trunked mode on a secondary basis to conventional interoperability operations: 23/983, 24/984, 103/1063, 104/1064, 183/1143, 184/1144, 263/1223, 264/1224, 657/1617, 658/1618, 737/1697, 738/1698, 817/1777, 818/1778, 897/1857, 898/1858. For every ten general use channels trunked at a station, entities may obtain a license to operate in the trunked mode on two of the above contiguous Interoperability channel pairs. The maximum number of Interoperability channel pairs that can be trunked at any one location is eight.

* * * * *

(b)(7) *Secondary trunking channels.* The following channel pairs are reserved for secondary trunking operations: 21/981, 22/982, 101/1061, 102/1062, 181/1141, 182/1142, 261/1221, 262/1222, 659/1619, 660/1620, 739/1699, 740/1700, 819/1779, 820/1780, 899/1859, and 900/1860. They may be used only in combination with the appropriate adjacent Interoperability channel pairs specified in (b)(1)(iii) of this section in trunked systems.

* * * * *

(c)(1) *Wideband interoperability channels*. The following wideband channels are designated for nationwide interoperability licensing and use, but are not available for licensing or use pending Commission adoption of a wideband interoperability standard: 28-30, 37-39, 46-48, 73-75, 82-84, 91-93, 148-150, 157-159, 166-168, 193-195, 202-204, 211-213.

* * * * *

(d) *Combining channels.* Except as noted in this section, 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. Interoperability

channels may not be combined with channels in another group except for channels for secondary trunking channels.

(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+(4xn), 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+(3xn) or 2+(3xn), where n = any integer between 0 and 79, inclusive (*e.g.*, channel number 1, 2, 4, 5, 7, 8, ... 238, 239). The lowest (in frequency) channel for three channel combinations must be a channel whose number is equal to 1+(3xn), where n = any integer between 0 and 79, inclusive (*e.g.*, channel number 1, 4, 7, 10, ... 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.

* * * * *

3. Section 90.531(b)(2) is amended by removing the following channels: 659, 660, 739, 740, 819, 820, 899, 900, 1619, 1620, 1699, 1700, 1779, 1780, 1859, and 1860; and adding the following channels: 37, 38, 61, 62, 77, 78, 141, 142, 221, 222, 277, 278, 301, 302, 317, 318, 997, 998, 1021, 1022,1037, 1038, 1101, 1102, 1181, 1182, 1237, 1238, 1261, 1262, 1277, and 1278.

4. Section 90.547 is revised to read as follows:

§ 90.547 Narrowband interoperability channel capability requirement.

(a) Except as noted below, mobile and portable transmitters operating on narrowband channels in the 764-776 MHz and 794-806 MHz frequency bands must be capable of operating on all of the designated nationwide narrowband Interoperability channels pursuant to the standards specified in this part.

(1) Mobile and portable transmitters that are designed to operate only on the Low Power Channels specified in Sections 90.531 (b)(3) and (4) are exempt from this Interoperability channel requirement.

(2) Mobile and portable transmitters that are designed to operate only in the data mode must be capable of operation on the data Interoperability channels specified in Section 90.531(b)(1)(i); but need not be capable of voice operation on other Interoperability channels.

(3) Mobile and portable transmitters that are designed to operate only in the voice mode do not have to operate on the data Interoperability channels specified in Section 90.531(b)(1)(i).

(b) Mobile and portable transmitters designed for data are not required to be voice capable, and vice versa.

5. Section 90.548 is added to read as follows:

§ 90.548 Interoperability Technical Standards

(a) Transmitters required (See 90.547) to be capable of operating on narrowband Interoperability channels in the 764-776 and 794-806 MHz band (See 90.531) shall conform such operations to the following technical standards:

(1) Transmitters designed for voice operation shall include a 12.5 kHz bandwidth mode of operation conforming to the following standards: ANSI/TIA/EIA 102.BAAA-1 (common air interface) for operation in the 12.5 kHz FDM mode; ANSI/TIA/EIA 102.BABA (vocoder).

(2) Transmitters designed for data transmission shall include a 12.5 kHz bandwidth mode of operation conforming to the following standards: ANSI/TIA/EIA 102.BAEA (data overview); ANSI/TIA/EIA 102.BAEB (packet data specification); ANSI/TIA/EIA 102.BAEA (radio control protocol); ANSI/TIA/EIA 102.BAAA-1 (common air interface) for operation in the 12.5 kHz FDM mode.

(b) Copies of the standards listed in this Section that are incorporated by reference can be purchased from the American National Standards Institute, Washington, DC Headquarters, 1819 L Street, NW, 6th Floor, Washington, DC 20036.

(c) Copies of the standards listed in this Section that are incorporated by reference may be inspected at the Federal Communications Commission, 445 12th Street, SW, Washington, DC (Reference Information Center) or at the Office of the Federal Register, 800 North Capitol Street, NW, Suite 700, Washington D.C.

6. Section 90.553 is revised to read as follows:

§ 90.553 Encryption

(a) Encryption is permitted on all but the two nationwide Interoperability calling channels. Radios employing encryption must have a readily accessible switch or other readily accessible control that permits the radio user to disable encryption.

(b) If Encryption is employed then the following encryption protocol must be used: ANSI/TIA/EIA 102.AAAA-A-2001.

(c) Copies of the standards listed in this Section that are incorporated by reference can be purchased from TIA/EIA, 2500 Wilson Boulevard, Arlington, VA, 22201; Global Engineering Documents, 155 Inverness Way East, Englewood, CO 80112; or the American National Standards Institute, 1819 L Street, N.W., 6th Floor, Washington, DC 20036.

APPENDIX D

Public Safety 700 MHz Band – Spectrum Designations

The instant *Fourth Memorandum Opinion and Order* does not change the amount of spectrum designated for each use. By way of reference, the twenty-four megahertz of spectrum allocated for public safety services in the 700 MHz band is designated, as a the result of the Commission's actions in the *Fourth Report and Order*, as follows:

700 MHz Public Safety Band—Spectrum Designations

DESIGNATED PURPOSE	AMOUNT OF SPECTRUM	NARROWBAND (6.25 kHZ)	WIDEBAND (50 kHZ)
General Use	12.5 MHz (52.1 %)	7.7 MHz (1232 channels)	4.8 MHz (96 channels)
Interoperability ("IO")	2.6 MHz (10.8 %)	0.8 MHz (128 channels) non-IO secondary trunking • 32 of these 128 channels, which **equates to eight 12.5 kHz channel pairs,** may be added to non-IO trunked systems • non-IO trunking is secondary to IO	1.8 MHz (36 channels)
Secondary Trunking	0.2 MHz (0.8 %)	0.2 MHz (32 channels) non-IO trunked 25 kHz systems • 32 non-IO channels (**eight 12.5 kHz pairs adjacent to the eight 12.5 kHz IO channels above)** that may be added to non-IO trunked systems • available only to licensees of the eight 12.5 kHz IO channels (above) that use non-IO trunked 25 kHz systems • secondary to IO	- 0 -
State License	2.4 MHz (10.0 %)	2.4 MHz (384 channels)	- 0 -
Low Power	0.3 MHz (1.3 %)	0.3 MHz (48 channels)	- 0 -
Reserve	6.0 MHz (25.0 %)	0.6 MHz (96 channels)	5.4 MHz (108 channels)
TOTAL	24 MHz (100 %)	12 MHz (1920 channels)	12 MHz (240 channels)

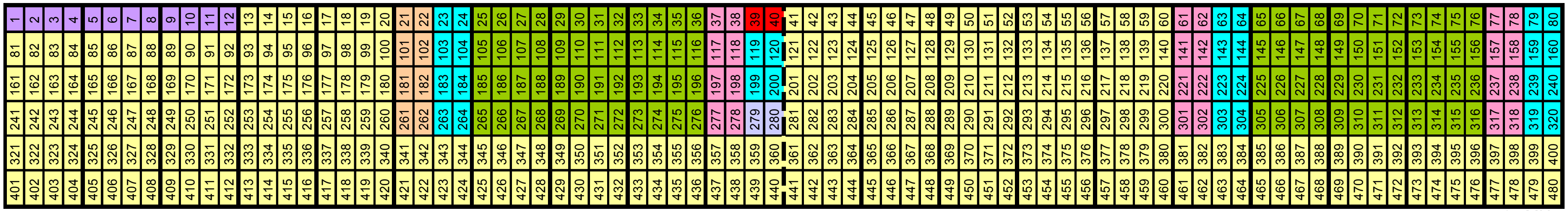
APPENDIX E

Public Safety 700 MHz Band – Segmentation and Channelization Table

700 MHz BAND PLAN per *Fourth MO&O* in WT Dkt. 96-86 (TV Chs. 63/64)

480 NARROWBAND **BASE** CHANNELS - SEGMENT 1 (6.25 kHz each, aggregate to 25 kHz)

764 MHz

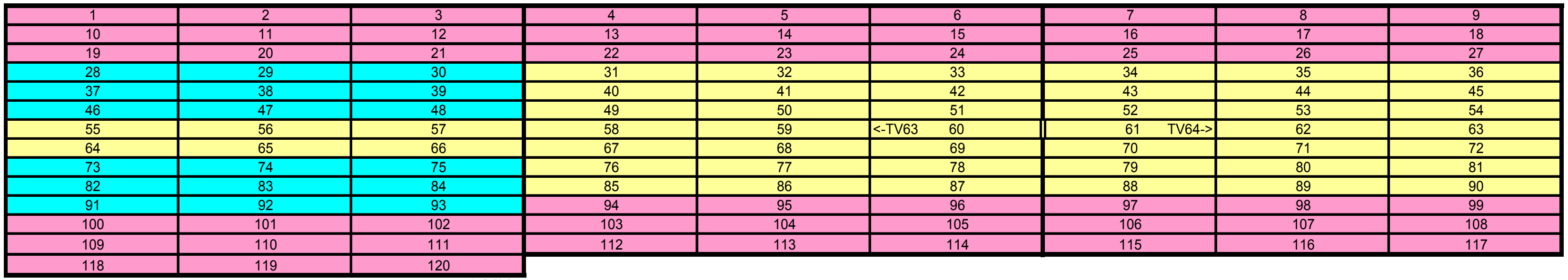


1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160
161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240
241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320
321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400
401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480

767 MHz

120 WIDEBAND **BASE** CHANNELS - SEGMENT 1 (50 kHz each, aggregate to 150 kHz)

767 MHz



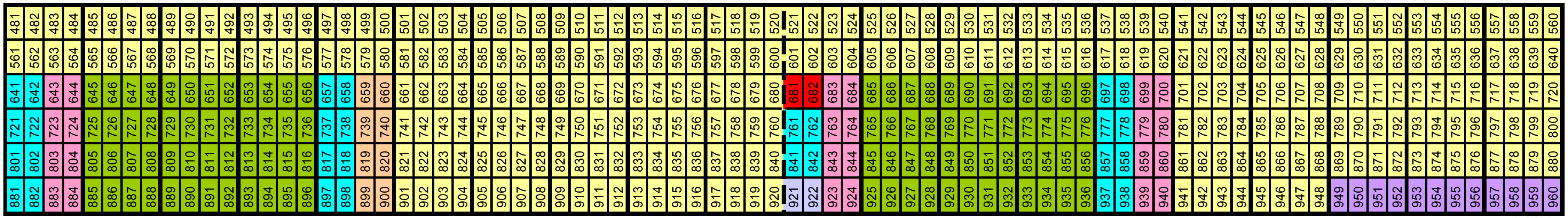
1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18
19	20	21	22	23	24	25	26	27
28	29	30	31	32	33	34	35	36
37	38	39	40	41	42	43	44	45
46	47	48	49	50	51	52	53	54
55	56	57	58	59	<-TV63 60	61 TV64->	62	63
64	65	66	67	68	69	70	71	72
73	74	75	76	77	78	79	80	81
82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99
100	101	102	103	104	105	106	107	108
109	110	111	112	113	114	115	116	117
118	119	120						

773 MHz

- GENERAL USE
- INTEROPERABILITY
- RESERVE
- STATE LICENSE
- LOW POWER
- 2ndary TRUNKING
- I/O Nationwide CALL
- I/O Low Speed DATA

480 NARROWBAND **BASE** CHANNELS - SEGMENT 2 (6.25 kHz each, aggregate to 25 kHz)

773 MHz



481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	524	525	526	527	528	529	530	531	532	533	534	535	536	537	538	539	540	541	542	543	544	545	546	547	548	549	550	551	552	553	554	555	556	557	558	559	560
561	562	563	564	565	566	567	568	569	570	571	572	573	574	575	576	577	578	579	580	581	582	583	584	585	586	587	588	589	590	591	592	593	594	595	596	597	598	599	600	601	602	603	604	605	606	607	608	609	610	611	612	613	614	615	616	617	618	619	620	621	622	623	624	625	626	627	628	629	630	631	632	633	634	635	636	637	638	639	640
641	642	643	644	645	646	647	648	649	650	651	652	653	654	655	656	657	658	659	660	661	662	663	664	665	666	667	668	669	670	671	672	673	674	675	676	677	678	679	680	681	682	683	684	685	686	687	688	689	690	691	692	693	694	695	696	697	698	699	700	701	702	703	704	705	706	707	708	709	710	711	712	713	714	715	716	717	718	719	720
721	722	723	724	725	726	727	728	729	730	731	732	733	734	735	736	737	738	739	740	741	742	743	744	745	746	747	748	749	750	751	752	753	754	755	756	757	758	759	760	761	762	763	764	765	766	767	768	769	770	771	772	773	774	775	776	777	778	779	780	781	782	783	784	785	786	787	788	789	790	791	792	793	794	795	796	797	798	799	800
801	802	803	804	805	806	807	808	809	810	811	812	813	814	815	816	817	818	819	820	821	822	823	824	825	826	827	828	829	830	831	832	833	834	835	836	837	838	839	840	841	842	843	844	845	846	847	848	849	850	851	852	853	854	855	856	857	858	859	860	861	862	863	864	865	866	867	868	869	870	871	872	873	874	875	876	877	878	879	880
881	882	883	884	885	886	887	888	889	890	891	892	893	894	895	896	897	898	899	900	901	902	903	904	905	906	907	908	909	910	911	912	913	914	915	916	917	918	919	920	921	922	923	924	925	926	927	928	929	930	931	932	933	934	935	936	937	938	939	940	941	942	943	944	945	946	947	948	949	950	951	952	953	954	955	956	957	958	959	960

776 MHz

NARROWBAND CHANNELS:
Two may be combined provided that the lower channel number is odd (e.g., 1, 3, 5)
Four may be combined provided that the lower channel number is 1 + 4n, n = 0 to 479 (e.g., 1, 5,…1917)
Narrowband channels must maintain a data throughput efficiency of not less than 4.8 kbps for each 6.25 kHz of bandwidth.

WIDEBAND CHANNELS:
Two may be combined provided that the lower channel number is 1 + 3n or 2 + 3n, n = 0 to 79 (e.g., 1, 2, 4, 5,…238, 239)
Three may be combined provided that the lower channel number is 1 + 3n, n = 0 to 79 (e.g., 1, 4,…238)
Wideband channels must maintain a data throughput efficiency of not less than 384 kbps for each 150 kHz of bandwidth.

Channel numbers for combined channels are designated by the lowest and highest channel numbers separated by a hyphen, e.g., "1-2" and 1-3".

700 MHz BAND PLAN per *Fourth MO&O* in WT Dkt. 96-86 (TV Chs. 68/69)

480 NARROWBAND **MOBILE** CHANNELS - SEGMENT 3 (6.25 kHz each, aggregate to 25 kHz)

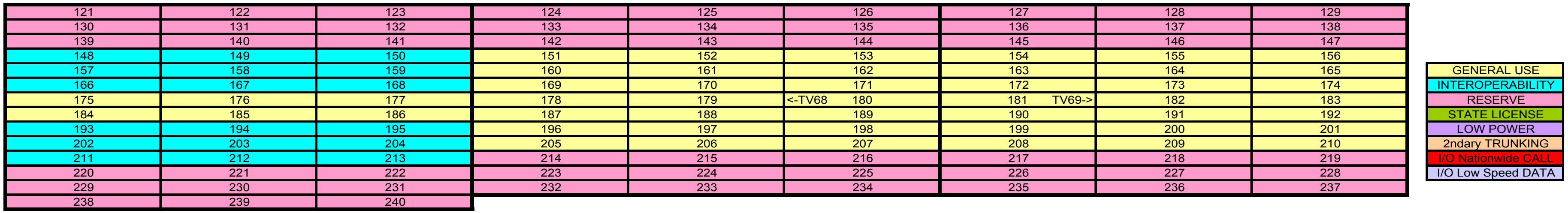
794 MHz

961	962	963	964	965	966	967	968	969	970	971	972	973	974	975	976	977	978	979	980	981	982	983	984	985	986	987	988	989	990	991	992	993	994	995	996	997	998	999	1000	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	1014	1015	1016	1017	1018	1019	1020	1021	1022	1023	1024	1025	1026	1027	1028	1029	1030	1031	1032	1033	1034	1035	1036	1037	1038	1039	1040
1041	1042	1043	1044	1045	1046	1047	1048	1049	1050	1051	1052	1053	1054	1055	1056	1057	1058	1059	1060	1061	1062	1063	1064	1065	1066	1067	1068	1069	1070	1071	1072	1073	1074	1075	1076	1077	1078	1079	1080	1081	1082	1083	1084	1085	1086	1087	1088	1089	1090	1091	1092	1093	1094	1095	1096	1097	1098	1099	1100	1101	1102	1103	1104	1105	1106	1107	1108	1109	1110	1111	1112	1113	1114	1115	1116	1117	1118	1119	1120
1121	1122	1123	1124	1125	1126	1127	1128	1129	1130	1131	1132	1133	1134	1135	1136	1137	1138	1139	1140	1141	1142	1143	1144	1145	1146	1147	1148	1149	1150	1151	1152	1153	1154	1155	1156	1157	1158	1159	1160	1161	1162	1163	1164	1165	1166	1167	1168	1169	1170	1171	1172	1173	1174	1175	1176	1177	1178	1179	1180	1181	1182	1183	1184	1185	1186	1187	1188	1189	1190	1191	1192	1193	1194	1195	1196	1197	1198	1199	1200
1201	1202	1203	1204	1205	1206	1207	1208	1209	1210	1211	1212	1213	1214	1215	1216	1217	1218	1219	1220	1221	1222	1223	1224	1225	1226	1227	1228	1229	1230	1231	1232	1233	1234	1235	1236	1237	1238	1239	1240	1241	1242	1243	1244	1245	1246	1247	1248	1249	1250	1251	1252	1253	1254	1255	1256	1257	1258	1259	1260	1261	1262	1263	1264	1265	1266	1267	1268	1269	1270	1271	1272	1273	1274	1275	1276	1277	1278	1279	1280
1281	1282	1283	1284	1285	1286	1287	1288	1289	1290	1291	1292	1293	1294	1295	1296	1297	1298	1299	1300	1301	1302	1303	1304	1305	1306	1307	1308	1309	1310	1311	1312	1313	1314	1315	1316	1317	1318	1319	1320	1321	1322	1323	1324	1325	1326	1327	1328	1329	1330	1331	1332	1333	1334	1335	1336	1337	1338	1339	1340	1341	1342	1343	1344	1345	1346	1347	1348	1349	1350	1351	1352	1353	1354	1355	1356	1357	1358	1359	1360
1361	1362	1363	1364	1365	1366	1367	1368	1369	1370	1371	1372	1373	1374	1375	1376	1377	1378	1379	1380	1381	1382	1383	1384	1385	1386	1387	1388	1389	1390	1391	1392	1393	1394	1395	1396	1397	1398	1399	1400	1401	1402	1403	1404	1405	1406	1407	1408	1409	1410	1411	1412	1413	1414	1415	1416	1417	1418	1419	1420	1421	1422	1423	1424	1425	1426	1427	1428	1429	1430	1431	1432	1433	1434	1435	1436	1437	1438	1439	1440

797 MHz

120 WIDEBAND **MOBILE** CHANNELS - SEGMENT 2 (50 kHz each, aggregate to 150 kHz)

797 MHz



121	122	123	124	125	126	127	128	129
130	131	132	133	134	135	136	137	138
139	140	141	142	143	144	145	146	147
148	149	150	151	152	153	154	155	156
157	158	159	160	161	162	163	164	165
166	167	168	169	170	171	172	173	174
175	176	177	178	179	<-TV68 180	181 TV69->	182	183
184	185	186	187	188	189	190	191	192
193	194	195	196	197	198	199	200	201
202	203	204	205	206	207	208	209	210
211	212	213	214	215	216	217	218	219
220	221	222	223	224	225	226	227	228
229	230	231	232	233	234	235	236	237
238	239	240						

803 MHz

- 🟨 GENERAL USE
- 🟦 INTEROPERABILITY
- 🟪 RESERVE
- 🟩 STATE LICENSE
- 🟪 LOW POWER
- 🟧 2ndary TRUNKING
- 🟥 I/O Nationwide CALL
- 🟦 I/O Low Speed DATA

480 NARROWBAND **MOBILE** CHANNELS - SEGMENT 4 (6.25 kHz each, aggregate to 25 kHz)

803 MHz

1441	1442	1443	1444	1445	1446	1447	1448	1449	1450	1451	1452	1453	1454	1455	1456	1457	1458	1459	1460	1461	1462	1463	1464	1465	1466	1467	1468	1469	1470	1471	1472	1473	1474	1475	1476	1477	1478	1479	1480	1481	1482	1483	1484	1485	1486	1487	1488	1489	1490	1491	1492	1493	1494	1495	1496	1497	1498	1499	1500	1501	1502	1503	1504	1505	1506	1507	1508	1509	1510	1511	1512	1513	1514	1515	1516	1517	1518	1519	1520
1521	1522	1523	1524	1525	1526	1527	1528	1529	1530	1531	1532	1533	1534	1535	1536	1537	1538	1539	1540	1541	1542	1543	1544	1545	1546	1547	1548	1549	1550	1551	1552	1553	1554	1555	1556	1557	1558	1559	1560	1561	1562	1563	1564	1565	1566	1567	1568	1569	1570	1571	1572	1573	1574	1575	1576	1577	1578	1579	1580	1581	1582	1583	1584	1585	1586	1587	1588	1589	1590	1591	1592	1593	1594	1595	1596	1597	1598	1599	1600
1601	1602	1603	1604	1605	1606	1607	1608	1609	1610	1611	1612	1613	1614	1615	1616	1617	1618	1619	1620	1621	1622	1623	1624	1625	1626	1627	1628	1629	1630	1631	1632	1633	1634	1635	1636	1637	1638	1639	1640	1641	1642	1643	1644	1645	1646	1647	1648	1649	1650	1651	1652	1653	1654	1655	1656	1657	1658	1659	1660	1661	1662	1663	1664	1665	1666	1667	1668	1669	1670	1671	1672	1673	1674	1675	1676	1677	1678	1679	1680
1681	1682	1683	1684	1685	1686	1687	1688	1689	1690	1691	1692	1693	1694	1695	1696	1697	1698	1699	1700	1701	1702	1703	1704	1705	1706	1707	1708	1709	1710	1711	1712	1713	1714	1715	1716	1717	1718	1719	1720	1721	1722	1723	1724	1725	1726	1727	1728	1729	1730	1731	1732	1733	1734	1735	1736	1737	1738	1739	1740	1741	1742	1743	1744	1745	1746	1747	1748	1749	1750	1751	1752	1753	1754	1755	1756	1757	1758	1759	1760
1761	1762	1763	1764	1765	1766	1767	1768	1769	1770	1771	1772	1773	1774	1775	1776	1777	1778	1779	1780	1781	1782	1783	1784	1785	1786	1787	1788	1789	1790	1791	1792	1793	1794	1795	1796	1797	1798	1799	1800	1801	1802	1803	1804	1805	1806	1807	1808	1809	1810	1811	1812	1813	1814	1815	1816	1817	1818	1819	1820	1821	1822	1823	1824	1825	1826	1827	1828	1829	1830	1831	1832	1833	1834	1835	1836	1837	1838	1839	1840
1841	1842	1843	1844	1845	1846	1847	1848	1849	1850	1851	1852	1853	1854	1855	1856	1857	1858	1859	1860	1861	1862	1863	1864	1865	1866	1867	1868	1869	1870	1871	1872	1873	1874	1875	1876	1877	1878	1879	1880	1881	1882	1883	1884	1885	1886	1887	1888	1889	1890	1891	1892	1893	1894	1895	1896	1897	1898	1899	1900	1901	1902	1903	1904	1905	1906	1907	1908	1909	1910	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920

806 MHz

NARROWBAND CHANNELS:

Two may be combined provided that the lower channel number is odd (e.g., 1, 3, 5)

Four may be combined provided that the lower channel number is 1 + 4n, n = 0 to 479 (e.g., 1, 5,…1917)

Narrowband channels must maintain a data throughput efficiency of not less than 4.8 kbps for each 6.25 kHz of bandwidth.

WIDEBAND CHANNELS:

Two may be combined provided that the lower channel number is 1 + 3n or 2 + 3n, n = 0 to 79 (e.g., 1, 2, 4, 5,…238, 239)

Three may be combined provided that the lower channel number is 1 + 3n, n = 0 to 79 (e.g., 1, 4,…238)

Wideband channels must maintain a data throughput efficiency of not less than 384 kbps for each 150 kHz of bandwidth.

Channel numbers for combined channels are designated by the lowest and highest channel numbers separated by a hyphen, e.g., "1-2" and 1-3".