FCC MAIL SECTION

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

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In the Matter of	
Improving Public Safety Communications in the 800 MHz Band	WT Docket 02-55
Consolidating the 800 and 900 MHz Industrial/Land Transportation and Business Pool Channels	ET Docket No. 00-258
Amendment of Part 2 of the Commission's Rules to Allocate Spectrum Below 3 GHz for Mobile and Fixed Services to Support the Introduction of New Advanced Wireless Services, including Third Generation Wireless Systems	RM-9498
Petition for Rule Making of the Wireless Information Networks Forum Concerning the Unlicensed Personal Communications Service	RM-10024
Petition for Rule Making of UT Starcom, Inc., Concerning the Unlicensed Personal Communications Service	ET Docket No. 95-18
Amendment of Section 2.106 of the Commission's Rules to Allocate Spectrum at 2 GHz for use by the Mobile Satellite Service	

REPORT AND ORDER, FIFTH REPORT AND ORDER, FOURTH MEMORANDUM OPINION AND ORDER, AND ORDER

Adopted: July 8, 2004 **Released: August 6, 2004**

By the Commission: Chairman Powell, Commissioners Abernathy, Copps, and Adelstein issuing separate statements.

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I. INTRODUCTION

1. The Homeland Security obligations of the Nation's public safety agencies make it imperative that their communications systems are robust and highly reliable.[1] Accordingly, in this *Report and Order*, we adopt technical and procedural measures designed to address the ongoing and growing problem of interference to public safety communications in the 800 MHz band.[2] In reaching our decisions herein, we are fulfilling the Commission's obligation to "promote safety of life and property through the use of wire and radio communication."[3] We also reiterate our continuing commitment to "ensuring that essential public health and safety personnel have effective communications services available to them in emergency situations."[4]

[1] 47 U.S.C. § 337(f) defines "public safety services" as services:

(continued....)

2. With many of our Nation's first responders using the 800 MHz band for critical public safety communications (*e.g.*, to communicate with their respective dispatchers and each other at the scene of an incident), this band has become a linchpin in their ability to communicate effectively. In recent years, however, public safety systems in this band have encountered increasing amounts of interference from commercial mobile radio service (CMRS) providers. The interference problem in the 800 MHz band is caused by a fundamentally incompatible mix of two types of communications systems: cellular-architecture multi-cell systems—used by ESMR and cellular telephone licensees[5]—and high-site non-cellular systems—used by public safety, private wireless, and some SMR licensees and stems primarily from the operations of Nextel Communications, Inc. (Nextel), an "Enhanced" Specialized Mobile Radio (ESMR) provider in the 800 MHz band,[6] as well as the operations of cellular telephone providers in the Cellular A and B bands.[7] Throughout this proceeding, we have sought a solution to the interference problem that achieves the following paramount goals:

- a solution that abates "unacceptable interference" caused by ESMR and cellular systems to

(Continued from previous page)

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

(B) that are provided
  (i) by State or local government entities; or
  (ii) by nongovernmental organizations that are authorized by a government entity whose primary mission is the provision of such services; and

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

[2] For purposes of this proceeding, "800 MHz band" refers to spectrum from 806-824/851-869 MHz, which is licensed to public safety, commercial, and private wireless operators pursuant to Part 90 of the Commission's rules.

[3] 47 U.S.C. § 151.

[4] Federal Communications Commission Strategic Plan FY 2003-FY2008, p.5 (2002).

[5] For the purposes of this proceeding, the term "800 MHz cellular system" will refer to systems which employ a "high-density cellular" architecture. *See* ¶ 172 *infra* for a definition of "800 MHz cellular systems."

[6] Specialized Mobile Radio (SMR) systems provide land mobile communications services (other than radiolocation services) in the 800 MHz and 900 MHz band on a commercial basis. *See* 47 C.F.R. §§ 90.7, 90.601 *et seq.* ESMR is a term coined by Nextel to describe SMR systems, such as Nextel's, that use cellular architecture, *i.e.*, systems that use multiple, interconnected, multi-channel transmit/receive cells and employ frequency reuse to serve a larger number of subscribers than is possible using non-cellular technology. The particular ESMR technology used by Nextel—the Motorola iDEN system—is capable of using cellular architecture in non-contiguous spectrum. A similar, derivative Motorola technology, known as "Harmony," is also in limited use. Although the term "ESMR" does not appear in the Commission's rules, it has appeared in the Commission's case law. *See* Request of Fleet Call, Inc. *Memorandum Opinion and Order*, FCC 91-56, 6 FCC Rcd 1533 ¶ 13(1991). More recently, the Wireless Telecommunications Bureau has defined ESMR as an alternative method to provide wireless service that is based on digital TDMA technology and operates with individual base stations. *See* "Wireless Telecommunications Bureau Seeks Comment on Qualcomm Inc.'s Petition," *Public Notice*, 15 FCC Rcd 2580, 2619 (WTB 2000).

[7] Cellular telephone providers are licensed in the Cellular Radiotelephone Service, pursuant to Part 22 of the Commission's rules, and operate cellular architecture systems in the Cellular A and B bands (824-849/864-894 MHz), which lie immediately above the 800 MHz band. *See* 47 C.F.R. § 22.99. Hereinafter, for brevity's sake, we refer to these systems as "cellular telephone" or "cellular" systems. While cellular telephone systems are similar to ESMR systems, they operate in contiguous spectrum and employ somewhat different technology.

800 MHz public safety systems;[8]

- a solution that is both equitable and imposes minimum disruption to the activities of all 800 MHz band users, including public safety, non-cellular[9] SMR, and Business, Industrial and Land Transportation (B/ILT) systems;[10]
- a solution that results in responsible spectrum management; and
- a solution that provides additional 800 MHz spectrum that can be quickly accessed by public safety agencies and rapidly integrated into their existing systems.

3. Based on the extensive record of this proceeding and the goals we seek to accomplish, we conclude that the most effective solution to the public safety interference problem in the 800 MHz band is a Commission-derived plan, which is comprised of both long-term and short-term components. As the short-term vehicle by which we ensure a more effective response to the ongoing interference problem, we implement technical standards defining unacceptable interference in the 800 MHz band as well as procedures detailing who bears responsibility for abating this interference and what steps responsible parties must take. For the long-term, we reconfigure the 800 MHz band to address the identified root cause of the interference by separating generally incompatible technologies.

4. To achieve this new 800 MHz band plan, we establish a transition mechanism by which (1) there is minimal disruption to the operations of all affected 800 MHz incumbents during the transition period; (2) the associated reconfiguration costs are funded; and (3) the public safety community and, later, critical infrastructure industries (CII),[11] obtain access to an average additional 4.5 megahertz of 800 MHz

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[8] "Unacceptable interference" is a term of art adopted for the limited purposes of this proceeding. *See* ¶¶ 97-107 *supra*. It defines a bright-line test for interference protection that takes into account, among other factors, the strength of the desired signal and the characteristics of the receiver being employed. It is not intended to determine what level of interference is unacceptable for any other purpose or in any other band.

[9] "Non-cellular" systems are systems that provide service to their mobile users or subscribers from one or a small number of base stations, which are typically "high site" (*i.e.*, located at high elevations, on towers, mountains, hill tops, or tall buildings) multiple, interconnected, multi-channel transmit/receive cells and employ frequency reuse to serve a larger number of subscribers. For the purposes of this proceeding, the term non-cellular will refer to systems which do not employ a "high-density cellular" architecture. *See* ¶¶ 170-174 *infra*.

[10] Business and Industrial/Land Transportation (B/ILT) licensees are licensed in the Private Land Mobile Radio Service pursuant to Part 90 of the Commission's Rules and utilize their systems for private, internal needs in a variety of commercial applications (e.g., factories, taxis. B/ILT typically use "high-site, high power" systems in the 800 MHz and 900 MHz. See 47 C.F.R. 90.35. *See also* n. 9 for a description of high site, high power systems.

[11] For purposes of this *Report and Order*, we define as CII licensees those entities, outside of the scope of the "public safety service" definition of 47 U.S.C. § 337(f), *see* n. 1 *supra*, but which operate "public safety" radio services within the scope of Section 309(j)(2) of the Act. 47 U.S.C. § 309(j)(2) defines "public safety radio services" as including private internal radio services used by State and local governments and non-government entities, and including emergency road services provided by not-for profit organizations, that: (i) are used to protect the safety of life, health, or property; and (ii) are not made commercially available to the public.

Examples of CII licensees include 800 MHz systems that provide private internal radio services used by utilities, railroads, metropolitan transit systems, pipelines, private ambulances, volunteer fire departments, and not-for-profit organizations that offer emergency road services, such as the American Automobile Association (AAA).

We recognize that the section 309(j)(2) definition is more encompassing than that proposed by Nextel in the "White Paper." *See* Promoting Public Safety Communications, Realigning the 800 MHz Land Mobile Radio (continued....)

band spectrum. We believe that the totality of these measures will both eliminate unacceptable interference currently encountered by 800 MHz public safety and CII systems[12] and reflect sound spectrum management principles. Our plan incorporates essential elements of a proposal developed by Nextel, the major public safety organizations, and various private wireless organizations (the so-called "Consensus Parties").[13]

5. In recognition of the public interest benefit derived from robust and reliable public safety

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Band to Rectify Commercial Mobile Radio - Public Safety Interference and Allocate Additional Spectrum to Meet *Critical Public Safety Needs, Nextel Communications, Inc, submitted by Robert S. Foosaner*, Nextel Communications, Inc., to Thomas J. Sugrue, Chief, Wireless Telecommunications Bureau, FCC (cover letter dated Nov. 12, 2001) (White Paper) at 46. In this regard, we observe that in the White Paper, Nextel cites a study undertaken by the Department of Commerce, National Telecommunications and Information Administration, which requested comment on a broader definition of CII, including pipelines and railroads. *See* White Paper at n. 60; Request for Comment on Energy, Water and Railroad Service Providers' Spectrum Use Study, 66 Fed Reg. 18447 (2001). Section 309(j)(2) also is broader than the definition proposed by the Critical Infrastructure Communications Council (CICC), which is composed of the following organizations: The American Gas Association, the American Petroleum Institute, the American Public Power Association, the American Water Works Association, the Association of American Railroads, the Edison Electric Institute, the Interstate Natural Gas Association of America, the National Association of Water Companies, the National Rural Electric Cooperative Association, and the United Telecom Council (UTC). *See* UTC Comments at n. 2. We nonetheless believe that this expanded definition is appropriate in this context because it recognizes that the very nature of the services provided by the included entities involves potential hazard to life and property and that CII entities often work hand in hand with public safety officials at the scene of an incident. Indeed, reliable CII radio communications have long proven essential in speeding recovery from natural or man-made disasters. Our decision to define CII is confined to this proceeding and does not represent a Commission decision that CII entities are public safety entities.

[12] Although we focus on the benefits to public safety and CII, we do not intend to imply that other 800 MHz radio systems will not be beneficiaries of the actions we take today. Except where specifically stated otherwise, the interference protections we afford today inure to the benefit of all 800 MHz non-cellular licensees. "Non-cellular 800 MHz licensees," as used herein, refers to public safety, CII, B/ILT and non-cellular SMR licensees.

[13] The proponents of this proposal have referred to themselves as the "Consensus Parties" and we use that term for reference purposes in this *Report and Order*. The Consensus Parties' members are the Association of Public Safety Communications Officials-International (APCO), International Association of Chiefs of Police (IACP), International Association of Fire Chiefs, Inc. (IAFC), International Municipal Signal Association (IMSA), Major Cities Chiefs Association (MCCA), Major County Sheriffs' Association (MCSA), National Sheriffs' Association (NSA), Aeronautical Radio, Inc. (ARINC), American Mobile Telecommunications Association (AMTA), American Petroleum Institute (API), Association of American Railroads (AAR), Forest Industries Telecommunications (FIT), Industrial Telecommunications Association (ITA), PCIA - The Wireless Infrastructure Association (PCIA), Taxicab, Limousine and Paratransit Association (TLPA), National Stone, Sand and Gravel Association (NSSGA), and Nextel. *See* Letter, dated October 29, 2002, from Robert M. Gurss, Esq., Counsel for APCO to Marlene H. Dortch, Secretary, Federal Communications Commission. *See* n. 172 *infra*. However, while the Consensus Parties represent a broad coalition of commercial and public safety entities, we recognize that their position does not reflect a consensus of all of the various parties to this proceeding, including some public safety entities that object to the Consensus Parties' proposal or elements thereof. *See, e.g.*, Letter, dated March 24, 2004, from Chuck Canterbury, National President, Fraternal Order of Police (FOP) to George W. Bush, President, United States of America: Letter, dated March 25, 2004 from Art Gordon, National Executive Vice President, Federal Law Enforcement Officers Association to George W. Bush, President, United States of America. With regard to the Fraternal Order of Police letter, we observe that on July 1, 2004, the FOP indicated that their concerns over the Consensus Plan have been addressed and that they now support the Consensus Plan. *See* Letter dated July 1, 2004, from Chuck Canterbury, National President, Fraternal Order of Police, to Michael K. Powell, Chairman, Federal Communications Commission.

communications coupled with the spectrum rights Nextel will surrender as well as financial commitments that Nextel will incur in connection with band reconfiguration, upon acceptance of Nextel of the conditions and obligations that we place on it in this R&O, we will modify certain Nextel licenses to provide it with rights to operate on ten megahertz of spectrum in the 1.9 GHz band, conditioned on fulfillment of the obligations we place on it in this *Report and Order.*[14] As a necessary predicate for the license modifications, we also take action by this Order in ET Docket No. 00-258 and ET Docket No. 95-18 to redesignate the spectrum for the provision of licensed Fixed and Mobile services to be used for Advanced Wireless Services (AWS).[15] To ensure that by these actions Nextel, other licensees and the public are treated equitably, and that Nextel does not realize any windfall gain, we confer these 1.9 GHz spectrum rights on a "value for value" basis. Under this approach, we credit Nextel for (1) the net value of spectrum rights that Nextel is relinquishing to public safety, CII, and other 800 MHz band licensees; (2) the actual cost of 800 MHz band reconfiguration (including both Nextel's costs to support relocation by other licensees and Nextel's own relocation costs); and (3) costs incurred by Nextel to clear the 1.9 GHz band, less any reimbursed expenses. If these combined offsets ultimately total less than the value determined by this *Report and Order* for the 1.9 GHz spectrum rights, we require Nextel to make a payment to the U.S. Treasury at the conclusion of the transition process equal to the difference.[16]

6. In complying with the obligations we place upon it in this *Report and Order,* we recognize that Nextel may have to shift some of its operations from the 800 MHz band to 900 MHz band frequencies in order to provide the "green space" necessary to effect reconfiguration of the 800 MHz band. Moreover, in some areas, Nextel may have to share spectrum in the 817-824 MHz/862-869 MHz segment of the reconfigured band with other ESMR licensees.[17] To the extent that such sharing may reduce the amount of 800 MHz spectrum available to Nextel, we believe we should provide the regulatory flexibility necessary for Nextel to make up the shortfall by using 900 MHz band channels. We therefore amend our rules to allow 900 MHz band licensees to initiate CMRS operations on their currently authorized spectrum or to assign their authorizations to others for CMRS use.[18]

7. The totality of the actions we take today are based on unique and compelling public interest considerations in the record before us regarding the serious and continuing public safety interference problems in the 800 MHz band. These considerations require that we take the most effective actions, in the short-term and long-term, to promote robust and reliable public safety communications in the 800 MHz band to ensure the safety of life and property. While we are mindful of our statutory obligations under Section 309(j) of the Act regarding the use of competitive bidding procedures for the assignment of spectrum, we nonetheless believe the license modifications we approve today are consistent with Section

[14] We make these modifications under the authority granted us by Sections 4, 301, 303 and 316 of the Act, 47 U.S.C. §§ 316, 303, 301, and 154(*i*). We set forth a detailed description of our legal authority in ¶¶ 62-87 *infra.*

[15] *See* ¶¶ 223-276 *infra.* AWS is the collective term we use for new and innovative fixed and mobile terrestrial wireless applications using bandwidth that is sufficient for the provision of a variety of applications, including those using voice and data (such as Internet browsing, message services, and full-motion video) content. Although AWS is commonly associated with so-called third generation (3G) applications and has been predicted to build on the successes of such current-generation commercial wireless services as cellular and Broadband PCS, the services ultimately provided by AWS licensees are only limited by the fixed and mobile designation of the spectrum we allocate for AWS and the service rules we ultimately adopt for the bands.

[16] *See* ¶¶ 210-212 *infra.*

[17] *See* ¶¶ 159-163 *infra.*

[18] *See* 47 C.F.R. § 90.621(f) in Appendix C *infra.*

309(j) of the Act and our other spectrum management obligations. This action does not signal any change in the Commission's policy of using competitive bidding as a licensing tool in other contexts, consistent with statutory requirements.

II. EXECUTIVE SUMMARY

8. In this *Report and Order,* we adopt a two-prong solution to the public safety interference problem in the 800 MHz band, with each prong having several components. First, to more adequately respond to individual interference events immediately, we establish an objective standard for defining "unacceptable interference" to 800 MHz non-cellular systems, establish rules and procedures for the expeditious implementation and enforcement of this standard, and endorse a variety of technical solutions and mechanisms, defined as "Enhanced Best Practices," to address interference abatement in the short-term. Second, to provide a better spectrum environment for public safety in the long-term, we adopt a plan for reconfiguration of the 800 MHz band and provide for a thirty-six-month transition by incumbent licensees from their current frequency assignments to new frequency assignments in the band.

9. Based on the extensive and comprehensive record of the proceeding, we are convinced that neither band reconfiguration alone, nor application of "technical fixes" on a case-by-case basis would adequately address the interference to 800 MHz public safety communications systems. Thus, we have adopted a Commission-derived solution which, in addition to decisions we have reached independently, incorporates both recommendations made by the proponents of case-by-case "technical fixes" and the proponents of band reconfiguration. In reaching this solution, we were aided by technical and economic studies, research data and legal analyses contained in the record.[19] We believe that the approach we adopt is technically and legally sound, logistically achievable, and representative of the collective expertise of all of the various interests which have addressed this significant issue.

10. In the first prong of this *Report and Order*, we take a number of steps to provide for immediate abatement of interference to 800 MHz band public safety and other non-cellular systems:

- We adopt a new, objective definition of "unacceptable interference," for purposes of this proceeding only, to determine when public safety and other non-cellular 800 MHz band licensees are entitled to interference protection.[20]

- We assign strict responsibility for eliminating unacceptable interference to the ESMR or cellular telephone operator(s) implicated in the interference occurrence, and assign joint responsibility to all involved commercial operators if unacceptable interference results from a combination of signals from multiple systems.[21]

- We require ESMR and cellular telephone licensees, on request, to notify public safety and CII licensees prior to activating new or modified cells, and require public safety and CII

[19] A detailed overview of the record is set forth in ¶ 61 *infra*. For citation purposes, we refer to comments received to the *Notice of Proposed Rulemaking* in this proceeding using the following format: [Party Name] Comments/Reply Comments at [Page or Paragraph Number]. We refer to comments received in response to the Consensus Parties Reply Comments using the following format: Comments of [Party Name] to the Consensus Parties Reply Comments at [Page or Paragraph Number]; we refer to comments received in response to the Supplemental Comments of the Consensus Parties using the following format: Comments/Reply Comments of [Party Name] to Supplemental Comments of the Consensus Parties at [Page or Paragraph Number].

[20] *See* ¶ 107 *infra.*

[21] *See* ¶ 130 *infra.*

licensees receiving such information to notify ESMR and cellular telephone licensees of changes in system parameters.[22]

11. Under the second prong of the *Report and Order*, we take steps to reconfigure the 800 MHz band to separate public safety, CII, and other non-cellular systems on the one hand, and ESMR systems, such as Nextel's, on the other:

- We designate fourteen megahertz in the upper portion of the 800 MHz band (817-824 MHz/862-869 MHz) for ESMR systems, while designating eighteen megahertz in the lower portion of the 800 MHz band (806-815 MHz/851-860 MHz) for use by public safety, CII, and other non-cellular systems.[23] Between the upper and lower band segments, we establish an Expansion Band and a Guard Band to separate ESMR operations from public safety and CII operations and protect the latter from interference.

- As part of band reconfiguration, we require Nextel to relinquish all of its 800 MHz band spectrum holdings below 817 MHz/862 MHz.[24] This will result in an additional average of 4.5 megahertz of 800 MHz band spectrum becoming available to the public safety community, particularly in the major markets where the shortage of public safety spectrum is most acute.

- We require band reconfiguration to be completed through a phased transition process within thirty-six months of release of a Public Notice announcing the start date of reconfiguration in the first NPSPAC region.[25] We provide for an independent Transition Administrator to oversee the band reconfiguration process.[26]

- We assign financial responsibility to Nextel for the full cost of relocation of all 800 MHz band public safety systems and other 800 MHz band incumbents to their new spectrum assignments with comparable facilities, *i.e.*, systems with comparable technological and operational capability.[27] We adopt financial, licensing, and administrative safeguards to ensure completion of band reconfiguration regardless of Nextel's financial condition.[28]

12. In connection with the reconfiguration of the 800 MHz band, as described above, we take the following additional spectrum-related actions:

- We accept Nextel's relinquishment of its current spectrum rights in the 700 MHz Guard Band and contemplate a future *Further Notice of Proposed Rulemaking* to determine the

[22] *See* ¶¶ 124-127 *infra.*

[23] *See* ¶ 151 *infra.*

[24] *See* ¶ 198 *infra.*

[25] *See* ¶ 201 *infra.*

[26] *See* ¶¶ 190-200 *infra.*

[27] *See* ¶¶ 177-178 *infra.*

[28] *See* ¶¶ 180-187 *infra.*

disposition of this spectrum.[29]

- In exchange for the spectrum rights Nextel is surrendering, coupled with the obligations it is incurring to accomplish 800 MHz band reconfiguration, we will modify certain Nextel licenses to provide Nextel with nationwide authority to operate in ten megahertz of spectrum at 1910-1915 MHz/1990-1995 MHz.[30] We require Nextel to reimburse UTAM Inc. (UTAM) for the cost of clearing the 1910-1915 MHz band, and to clear the 1990-2025 MHz band of BAS incumbents within thirty months of the effective date of this *Report and Order*.[31]

- To ensure that Nextel is treated equitably but does not realize an undue windfall, we condition the grant of 1.9 GHz band spectrum rights to Nextel on its meeting the obligations imposed by this *Report and Order*, and on its payment to the U.S. Treasury of any difference between the value of the 1.9 GHz band spectrum rights, the value of spectrum rights relinquished by Nextel, and Nextel's costs incurred in reconfiguring the 800 MHz band and clearing the 1.9 GHz band.[32]

- We reject Nextel's proposed relinquishment of 900 MHz spectrum as part of the Consensus Parties' proposal,[33] but allow 900 MHz band Private Land Mobile Radio (PLMR) service licensees to initiate CMRS operations on their currently authorized spectrum or to assign their authorizations to others for CMRS use.[34]

III. MAJOR FINDINGS AND DECISIONS

A. The 800 MHz Interference Problem and Solutions

13. In the *NPRM*, the Commission documented the increasing incidence of interference to 800 MHz band public safety systems from high density ESMR and cellular telephone systems.[35] We tentatively concluded that interference to public safety represented "a sufficiently serious problem that a solution must be found."[36] We find that the record in this proceeding supports the following findings:

- The public safety interference problem described in the *NPRM* is serious and will only increase in severity as private, public safety and commercial use of the 800 MHz band intensifies.

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[29] *See* ¶¶ 207-209 *infra*.

[30] *See* ¶¶ 217-222 *infra*.

[31] *See* ¶¶ 239-263 *infra*.

[32] *See* ¶ 212 *infra*.

[33] *See* ¶ 207 *infra*.

[34] *See* ¶¶ 335-337 *infra*.

[35] *See* Improving Public Safety Communications in the 800 MHz Band; Consolidating the 900 MHz Industrial/Land Transportation and Business Pool Channels, WT Docket No. 02-55, *Notice of Proposed Rulemaking*, 17 FCC Rcd 4873, 4482 ¶ 16 (2002), as modified in *Erratum*, 17 FCC Rcd 7169 (PSPWD 2002) (*NPRM*).

- Public safety agencies are becoming increasingly dependent on the 800 MHz band to meet their communications needs as spectrum used by public safety in lower bands has become congested, particularly in urban areas.[37]

- Although many ESMR and cellular telephone licensees have been commendably cooperative in bearing the responsibility for identifying and promptly curing interference at their own expense, their ability to continue to do so effectively will become problematic as more intense use is made of 800 MHz band and cellular telephone spectrum.

- Despite the claims by some that licensees in the cellular telephone bands cause little interference to 800 MHz band public safety systems,[38] strong evidence exists to the contrary.[39]

- We must take the actions necessary to ensure that first responders—both public safety and CII personnel—have communications channels free of unacceptable interference and thereby suitable for mission-critical operations including rapid response to major incidents that threaten Homeland Security.

14. Until now, the Commission's approach to interference resolution in the 800 MHz band has been to urge the involved parties to make voluntary technical changes to prevent or reduce interference at particular sites.[40] This is consistent with the policy reflected in current rules that require affected licensees to resolve interference through mutually satisfactory arrangements.[41] While these measures have helped to alleviate interference in some instances, the record leads us to conclude that the interference problem will only intensify as cellular-architecture licensees make more intensive use of their spectrum and that voluntary measures alone will not stem the growth of unacceptable interference. We thus are convinced that unacceptable interference will be stemmed in an efficient and effective manner, only by the actions we take today to establish mandatory interference-abatement rules.

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[36] *Id.* at 4882 ¶ 16.

[37] Although the Commission has designated spectrum for public safety use in the spectrally adjacent 700 MHz band (764-776 MHz and 794-806 MHz), that band currently is not usable by public safety in most of the population centers of the United States because of the presence of high-power television station incumbents. *See* Section 337(a) of the Communications Act, 47 U.S.C. § 337(a), as amended by § 3004 of the Balanced Budget Act of 1997, Pub. L. No. 105-33, 111 Stat. 251 (1997). *See also* Development of Operational, Technical and Spectrum Requirements for Meeting Federal, State and Local Public Safety Agency Communication Requirements Through the Year 2010, WT Docket 96-86. As a result, the potential for the public safety community to access the 700 MHz band in the near future is limited.

[38] *See, e.g.,* Verizon Comments at 3; Cingular and Alltel Comments at 2-3. Some parties argued that reports of interference were anecdotal in nature, and for that reason, did not represent a true evaluation of the problem. *See* Cinergy Comments at 7-9.

[39] *See, e.g., ex parte* comments, dated June 10, 2003, from City and County of Denver (Denver June 10 *Ex Parte*); *ex parte* comments, dated July 29, 2003, from Anne Arundel County (Anne Arundel July 29 *Ex Parte*).

[40] In 2000, public safety and CMRS entities incorporated many of these technical changes into a *Best Practices Guide*. *See* Avoiding Interference Between Public Safety Wireless Communications Systems and Commercial Wireless Communications Systems at 800 MHz, a Best Practices Guide, December 2000 at 5 (*Best Practices Guide*).

[41] *C.f.* 47 C.F.R. § 90.173(b); *see also* 47 C.F.R. § 90.403(e).

15. In this proceeding, parties have presented us with two long-term alternatives for addressing the 800 MHz interference problem:

- The Consensus Parties have proposed a band reconfiguration plan that would move ESMR systems—most notably Nextel—to the upper portion of the 800 MHz band, move all public safety and "high site" operators to the lower portion of the band, and make additional spectrum in the band available for public safety use.[42]

- Other parties, including cellular telephone licensees and their representatives, utilities and even some public safety agencies, have questioned the need for band reconfiguration, and aver that technical changes accompanied by certain mandatory procedural requirements, such as prior coordination of cell sites, would suffice to solve the interference problem without the need to reconfigure the 800 MHz band. One group of entities, the 800 MHz User Coalition, refers to this alternative as the "Balanced Approach."[43]

16. We agree, in part, with the suggestion by proponents of the Balanced Approach and other parties that we should augment the technical and procedural changes contained in the *Best Practices Guide* and apply certain of them on a mandatory basis. While we do not adopt all of the suggested technical restrictions, we have carefully considered various technical measures suggested by the parties and supplemented them with certain procedural rules. Hereinafter, we refer to this Commission-derived set of practices and procedures as Enhanced Best Practices.

17. On this record, however, we disagree with those parties that contend that exclusive reliance on Enhanced Best Practices on a case-by-case basis is the best long-term solution to the interference problem.[44] Although case-by-case treatment of potential and actual interference under an Enhanced Best Practices regime provides clear benefits over the current voluntary regime, we conclude that that approach, by itself, does not provide the best long-term answer to the problem of interference to public safety and other non-cellular operations in the 800 MHz band. Our finding in that regard rests on the following facts:

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[42] The designations "high-site" and "low-site" are often used to distinguish cellularized from non-cellularized systems. Thus, for example, the typical public safety 800 MHz system will employ one, or only a few, base stations with antennas located on high terrain, towers, buildings, etc. to provide wide-area coverage from the base station. Cellular-architecture systems, by comparison, make use of multiple, localized coverage, base stations whose antennas generally are mounted on low towers or other structures. We note, however, that the term "low-site" is often used to denominate cells *within* a cellularized system that have *very low* antenna elevations, *e.g.* thirty-feet and, accordingly, have a greater potential to cause interference than high-elevation cells in the system. *See* ¶¶ 170-174 *infra*.

[43] *See* http://www.fix800mhznow.com/documents/800_MHz_COALITION_10_29_03.pdf. The 800 MHz Users Coalition consists of: ALLTEL Communications, Ameren Corporation, American Electric Power (AEP), Applied Technology Group, Inc., AT&T Wireless Services, Inc., Cinergy Corporation, City of Baltimore, Maryland, City of Colorado Springs, Colorado, Consumers Energy Co., Edison Electric Institute (EEI), Fresno Mobile Radio, Inc., Holy Cross Electric Association, Mobile Relay Associates, National Rural Electrical Cooperative Association (NRECA), Palomar Communications, Preferred Communication Systems, Small Business in Telecommunications, Southern Company/Southern LINC, Supreme Radio Communications, Inc., U.S. Cellular Corp., UTC, and Western Wireless.

[44] *See, e.g.*, Letter, dated May 29, 2003, from Jill Lyon, Esq., Vice President and General Counsel, UTC to Marlene H. Dortch, Secretary, Federal Communications Commission (800 MHz Users Coalition May 29, 2003 *ex parte*).

- Addressing interference on a case-by-case basis is both labor-intensive and expensive.[45]

- The transactional costs of applying Enhanced Best Practices as an exclusive remedy would increase as new public safety and other non-cellular systems were implemented and ESMR and cellular licensees increased the capacity of their systems by adding more cells.

- The increased costs and labor burden disproportionately affects public safety agencies, many of which operate with very limited human, technical, and financial resources.

- Some interference situations respond poorly, if at all, to the use of the techniques contained in the Enhanced Best Practices.

- ESMR and cellular systems will continue to expand. This will increase congestion in the 800 MHz band as well as the attendant interference to public safety systems operating in the band. We would disserve the public interest if we allowed unacceptable interference to become ubiquitous before addressing the fundamental causes of this interference.

18. In contrast, band reconfiguration confers the following greater benefits over the long-term:

- Band reconfiguration addresses interference comprehensively and proactively by eliminating the current interleaving of public safety and commercial channels in the 800 MHz band and separating cellularized multi-cell and non-cellularized high-site systems within the band.

- Although there are significant short-term costs associated with band reconfiguration, it is the solution most likely to yield maximum interference protection benefits for the least cost over the long run.[46]

- Once implemented, a reconfigured band will reduce both the upfront amount of coordinated engineering work necessary to prevent interference and the burden of troubleshooting interference incidents on a case-by-case basis.

- Eliminating interleaving of public safety and commercial channels will reduce the number of "band edges" between spectrum utilized by the two different network architectures thus significantly reducing the risk of interference to public safety systems.

- With adoption of band reconfiguration, public safety entities will have access, on average, to 4.5 megahertz of additional 800 MHz spectrum, which they can readily incorporate into existing systems to enhance their ability to protect the safety of life and property. Moreover, public safety entities that wish to do so will have the option of using spectrum in the Expansion Band or the Guard Band, subject to the technical and operational limitations on those bands.

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[45] We also note that the record reflects instances in which, despite diligent effort on the part of all concerned, technical changes have been unable to abate interference. *See e.g.,* Denver June 10 *Ex Parte* at 12 -13; Anne Arundel July 29 *Ex Parte*.

[46] We note that the interference abatement measures used prior to band reconfiguration will remain necessary even after band reconfiguration is completed. Thus, although we expect instances of interference to be far less frequent under the reconfigured band plan, the availability of Enhanced Best Practices will ensure the quick and effective abatement of any residual interference that may occur.

- The relocation of the current NPSPAC channels from their current position to the lowest segment of the 800 MHz band will result in a greater potential for interoperability with public safety systems in the spectrally adjacent 700 MHz public safety band.

- The adoption of a reconfigured 800 MHz band plan will provide certainty to licensees planning to implement new 800 MHz systems or modify existing systems.

B. Entitlement to Interference Protection

19. We are adopting a new objective technical standard for determining whether a public safety or other non-cellular 800 MHz band licensee is entitled to interference protection. We adopt this standard to more finely adapt our rules to the technologies being deployed in the 800 MHz band. Specifically:

- "Unacceptable interference" is defined, for the limited purpose of this proceeding, as a function of threshold median received power levels of desired signals. Specifically, "unacceptable interference" occurs when the signals from a cellular architecture station or stations, cause the carrier-to-noise plus interference ratio of a radio meeting TIA-equivalent Class A standards to degrade below 20 dB in an area in which the median measured received signal power of the desired signal is equal to or greater than -104 dBm for mobile units or -101 dBm for portable units.[47] In the case of data radios, unacceptable interference occurs when the received signal power criteria, above, are met and the bit error rate of the radio exceeds the value specified by the radio's manufacturer for reliable operations.[48]

- Under the rules adopted in this Order, desired signals from systems operating in the 806-816 MHz/851-861 MHz band segment that equal or exceed the threshold are entitled to protection from unacceptable interference as defined above. Non-cellular systems operating from 816-817 MHz/861-862 MHz in the Guard Band are also provided interference protection, but to a lesser degree.[49]

- In recognition of the role that receiver characteristics play in the interference calculus, we are affording full protection against unacceptable interference only to systems whose mobile or portable receivers are capable of satisfactory operation at the threshold signal power in the absence of interference.[50] Other systems will receive lesser protection as a function of the degree to which their receivers exhibit inferior performance.

20. The method of interference abatement we adopt herein leaves to the involved parties—and not the Commission—the choice of how best to ensure that their systems do not cause unacceptable interference. Thus, a given party may choose from a variety of methods encompassed in the Enhanced Best Practices in each area where interference occurs, including, but not limited to, modification of the cell that is the source of interference or technical improvements to the affected public safety system or

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[47] *See* ¶¶ 105-107 *infra*.

[48] *Id.*

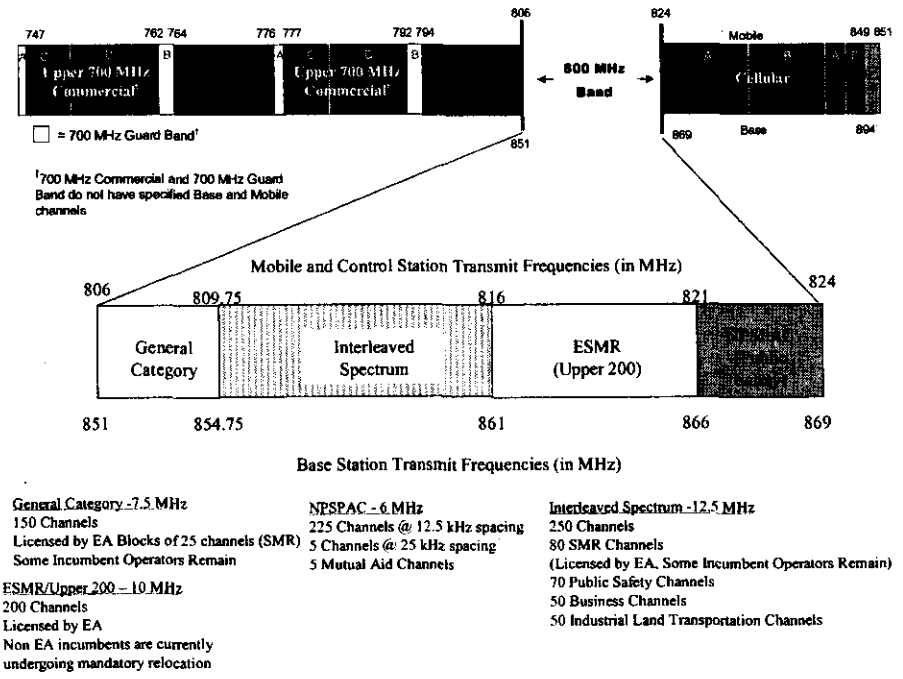
[49] *See* ¶ 158 and Figure 1 *supra*.

[50] In this *Report and Order*, we are relating entitlement to full interference protection to conformance with certain sensitivity, selectivity, and intermodulation-rejection performance standards typical of TIA "Class A" receivers. *See* ¶ 109 *infra*.

other non-cellular 800 MHz systems (at the commercial operator's expense).[51] In addition, to the extent that interference results from the combination of signals from multiple transmitters, and potentially multiple licensees, we place joint and several responsibility on such CMRS licensees to eliminate unacceptable interference using the remedies of their choice. In not imposing new, across-the-board emission limitations that would necessitate highly expensive technical changes to most, if not all, ESMR and cellular systems nationwide, we have heeded the filings of those parties who have decried the expense of such technical micromanagement and urged that the same goal can be achieved otherwise, for example, by the less intrusive means we adopt today.[52]

C. 800 MHz Band Reconfiguration

21. The 800 MHz band is currently configured as follows:



22. Our plan for reconfiguration of the 800 MHz band is designed to spectrally segregate public safety systems from ESMR and cellular telephone systems. In reaching this spectrum management decision, we are guided by the principle that we can minimize unacceptable interference in the 800 MHz band by placing similar system architectures in like spectrum and isolating dissimilar architectures from one another.[53] Under the new band plan adopted in this *Report and Order*, the 800 MHz band will be configured as follows:

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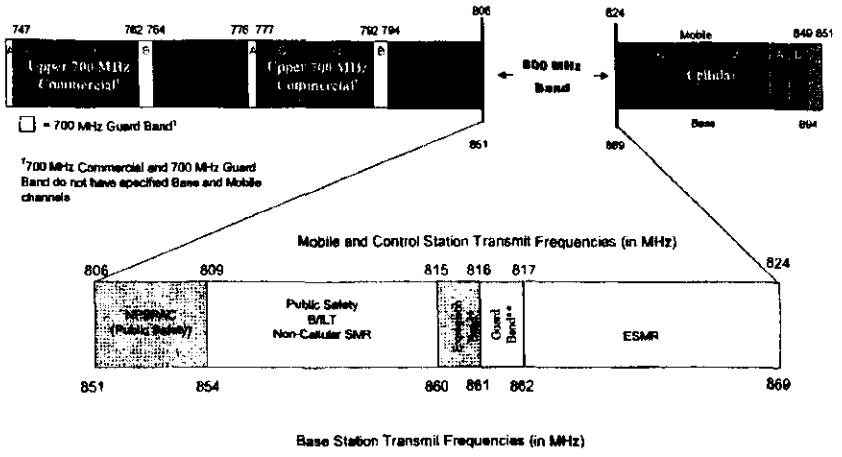
[51] We stress, however, that we expect parties to vigorously implement Enhanced Best Practices to abate interference even if this involves implementing a "channel swap" prior to official rebanding. *See* ¶ 123 *infra*.

[52] *See* Public Safety Wireless Network Comments at 18. *See also* Reply Comments of Rural Telecommunications Group to Supplemental Comments of the Consensus Parties.

[53] *See* FCC Staff Report, Spectrum Policy Task Force Report in ET Docket No. 02-135, 4, 22 (released Nov. 22, 2002).



*No public safety system will be required to remain in or relocate to the Expansion Band; although they may do so if they choose.

**No public safety or CII licensee may be involuntarily relocated to occupy the Guard Band.

23. The new band plan will have the following impact on existing licensees in the band:

- Systems in the current NPSPAC band will be relocated to 806-809/851-854 MHz in the current General Category band.[54] To accommodate NPSPAC relocation, Nextel will relinquish its General Category licenses and other existing General Category systems will be relocated elsewhere in the 800 MHz band.[55]

- Existing public safety systems and non-cellular B/ILT and SMR systems operating on interleaved channels between 809.75-816 MHz/854.75-861 MHz will continue to operate on those channels.

- Nextel will relocate to the 817-824 MHz/862-869 MHz band, and will vacate all channels it now uses in the 806-817 MHz/851-862 MHz band segment. Public safety, and later CII agencies will have exclusive access to all channels vacated by Nextel in the interleaved portion of the band below 815 MHz/860 MHz for a limited-year period of time.[56]

- No public safety licensee will be required to operate in the 815-816 MHz/860-861 MHz Expansion Band. Any public safety system currently located in the Expansion Band will be relocated to spectrum below the Expansion Band unless it exercises its option to remain in the

[54] *See* ¶ 37 *infra*.

[55] In some circumstances, public safety and CII systems operating in the 809-809.75 /854-854.75 MHz portion of the General Category band will not have to be relocated. Public safety will also have exclusive access to spectrum vacated by Nextel in this portion of the General Category Band for five years, and CII licensees will have access from year three to year five.

[56] These channels will be restricted to public safety eligibles for three years from the effective date of this *Report and Order*. Thereafter, for an additional two-year period, only public safety and CII eligibles may apply for said channels. At the end of this five-year period, any eligible applicant may apply.

Expansion Band.[57]

- No public safety or CII licensee will be required to operate in the 816-817 MHz/861-862 MHz Guard Band. Only licensees who voluntarily choose to relocate to the Guard Band will occupy this portion of the band.[58]

- Unless the subject of mutual agreement among affected parties, non-Nextel ESMR operations below 816/861 MHz may stay where they are, subject to a stringent non-interference obligation.[59]

24. Providing public safety with additional spectrum rights in the 800 MHz band, instead of elsewhere as others have proposed,[60] has significant advantages. First, spectrum rights in the 800 MHz band are currently more valuable to public safety licensees than spectrum rights in the 700 MHz public safety band which can be subject to interference from incumbent television stations. This interference may foreclose extensive use of the 700 MHz public safety band in certain markets for several years. Second, 800 MHz band spectrum rights are of particular value to public safety licensees because new channels can be integrated into their existing infrastructure at little additional cost: the additional channels can be added to existing base station sites with, typically, only minor hardware changes; and most existing public safety mobile and portable radios can be adapted to receive the additional channels with only minor modification or reprogramming. In sum, providing public safety with access to additional spectrum in the 800 MHz band can provide a virtually instant capacity increase for public safety systems and will facilitate interoperability with other agencies—an important capability for Homeland Security operations. To the extent that band reconfiguration may require extensive replacement of existing 800 MHz band public safety equipment, manufacturers likely will achieve economies of scale in the process. We urge manufacturers to pass on such savings to public safety agencies.

25. In crafting the band plan adopted herein, we examined all proposals submitted in the course of this proceeding. While we did not adopt any proposal in its entirety, we did extract elements from several proposals and adopted a modified version of the only band plan that with an effective, comprehensive approach for resolving the interference problems that jeopardized public safety.[61] We nonetheless

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[57] Under the relocation provisions we adopt today, public safety licensees will generally be located outside of the Expansion Band, except when a public safety licensee currently operating in these bands either explicitly declines to relocate or requests a channel therein. Those public safety systems operating in the Expansion Band will receive the same interference protection as if they were located outside of this band. *See* ¶¶ 154-156 *infra*.

[58] The Guard Band is carved from current EMSR spectrum. Therefore, no public safety licensees currently occupy the Guard Band and no public safety licensees will need to be relocated from this portion of the band. Systems that choose to relocate to the Guard Band will be entitled to limited interference protection as described at ¶¶ 158 and Figure 1 *infra*.

[59] In some Southeastern markets where both Southern LINC and Nextel offer ESMR service, insufficient spectrum exists in the 816-824/861-869 MHz band segment to accommodate existing ESMR systems and ESMR systems that may seek to exercise their option to relocate from the lower channels. In order not to unduly restrict ESMR operations in this region, we define the ESMR band in these markets as the band segment 813.5-824 MHz/858.5-869 MHz. The Expansion Band in this region will extend from 812.5-813.5 MHz/857.5-858.5 MHz. All licensees operating below 813.5 MHz/858.5 MHz in this region will be afforded full protection against unacceptable interference as specified in the *Report and Order*. *See* ¶¶ 164-169 *infra*.

[60] *See* Comments of Preferred Communications to Supplemental Comments of the Consensus Parties at 19-20.

[61] For example, only one proposal contained a feasible means of paying for band reconfiguration. *See* Supplemental Comments of the Consensus Parties at ii (Nextel commitment to provide up to $850 million for band (continued....)

recognize that the band plan we adopt is in some respects inconsistent with current international agreements. As a result, implementing the band plan in areas of the United States bordering Mexico and Canada will require modifications to international agreements for use of the 800 MHz band in the border areas. Since we value highly our agreements with these countries we intend to promptly pursue those modifications during our bilateral discussions with those countries' relevant regulatory bodies.[62] During the pendency of such modifications, all 800 MHz band operations (both cellular and non-cellular alike) must continue to be consistent with current international agreements. Consequently, if a region containing a border area is reconfigured, all 800 MHz band operations within the border area must conform to all international agreements unless and until such international agreements are amended to reflect a reconfigured 800 MHz band. We envision and intend that interference-free cross-border mutual-aid capability remain paramount during this interim period preceding modification of the applicable international agreements.

D. Band Reconfiguration Process

26. We recognize that our decision to reconfigure the 800 MHz band raises significant transition issues, particularly with respect to the relocation of public safety and other non-cellular licensees from old to new frequency assignments. We are sensitive to the concerns raised about service and operational disruption and are committed to ensuring that the band reconfiguration process does not result in degradation of existing service or an adverse effect on public safety communications and operations. We therefore have adopted rules that ensure both continuity of service and that relocating licensees receive "comparable facilities" on their new frequency assignments, whether this requires retuning existing equipment or providing replacement equipment.[63]

27. In an effort to further ensure a smooth transition to the new 800 MHz band plan, the relocation process will be managed by an independent Transition Administrator.[64] A committee of major 800 MHz band stakeholders will select the Transition Administrator who will perform a variety of administrative functions and mediate, or refer to mediation, any disputes that may arise in connection with band reconfiguration. Should any such disputes not be resolved by mediation, the Transition Administrator will compile a record and transmit it to the Commission. The Commission then will review the disputed matter *de novo*.[65]

28. We are committed to having band reconfiguration completed through a phased transition process within thirty-six months of release of a Public Notice announcing the start date of reconfiguration

(Continued from previous page)
reconfiguration). We note, also, that, later in this proceeding, the proponents of the Balanced Approach said that certain of their members were committed to pay the cost of implementing Best Practices applied on a case-by-case basis when their facilities were involved. We commend that commitment, which is consistent with the interference abatement responsibility policy we adopt herein. *See* ¶¶ 128-131 *infra*.

[62] Commission staff meet periodically, and whenever needed, with their regulatory counterparts from Mexico and Canada to discuss cross border issues and, when duly authorized, to derive recommended changes to existing international agreements. When formal amendments to agreements are needed, they are made through a process that requires the sanction of the government entity officially designated with the responsibility for international treaty consultations, which in the case of the United States is the Department of State.

[63] *See* ¶ 201 *infra*.

[64] *See* ¶¶ 190-200 *infra*.

[65] Such *de novo* Commission review is anticipated only after all other avenues have been exhausted, *e.g.*, mediation, arbitration or other alternative dispute resolution techniques based on the good faith effort of the parties.

in the first NPSPAC region. To ensure timely completion, we require Nextel to meet both an interim benchmark and a final benchmark. As an interim benchmark, within eighteen months of release of a Public Notice announcing the start date of reconfiguration in the first NPSPAC region Nextel must complete, and the Transition Administrator must certify that Nextel has completed, the retuning of Channels 1-120 for twenty NPSPAC Regions. If Nextel fails to meet this interim benchmark, for reasons that Nextel, with the exercise of due diligence, could reasonably have avoided, the Commission may consider and exercise any appropriate enforcement action within its authority, including assessment of monetary forfeitures or, if warranted, license revocation.[66] At thirty-six months, Nextel must complete, and the Transition Administrator must certify, all relocation of 800 MHz incumbents required by this Report and Order. If Nextel fails to meet this benchmark, for reasons that Nextel could reasonably have avoided, the Commission will determine whether forfeitures should be imposed and/or whether Nextel licenses, including, but not limited to, its 1.9 GHz licenses, should be revoked.

E. Guarantee of Sufficient Funds for Band Reconfiguration

29. Nextel has committed to pay up to $850 million for retuning and replacement expenses associated with its own relocation and the related relocations discussed in this *Report and Order*, an amount it claims is sufficient to cover all such costs. We do not believe, however, that Nextel should be able to cap its obligation to pay relocation costs, because doing so could leave public safety and other relocating entities without the means to complete the relocation process in the event that Nextel's estimates prove low and relocation costs exceeded any such cap. Therefore, we decline to "cap" Nextel's obligations at $850 million or any other amount but instead require Nextel to pay all costs of band reconfiguration, as defined in this *Report and Order*.

30. In addition, to protect against possible changes to Nextel's financial condition, we require Nextel to secure its commitment by means of an irrevocable letter of credit in the amount of $2.5 billion, within sixty days of the date this *Report and Order* is published in the Federal Register.[67] We believe this letter of credit strikes the appropriate balance between Nextel's estimate that band reconfiguration would cost $850 million and others' contention that Nextel's estimates were unrealistically low. We further note that Nextel may be required to obtain additional letters of credit if ongoing experience with band reconfiguration show the initial letter of credit to be inadequate.

F. Equitable Compensation for Band Reconfiguration

31. Nextel proposes that, as compensation for its relinquishment of some of its spectrum rights in the 700, 800 and 900 MHz bands and its commitment to pay 800 MHz band incumbent relocation costs, it should receive a nationwide license for ten megahertz of spectrum in the 1.9 GHz band.[68] We conclude that it is in the public interest to compensate Nextel for the surrendered spectrum rights and costs it incurs

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[66] We note that the Commission has issued Notices of Apparent Liability for Forfeiture assessing substantial penalties on carriers that have failed to comply with Commission rules intended to enhance the safety of life and property. *See* In re T-Mobile USA, Inc., *Notice of Apparent Liability for a Forfeiture*, 18 F.C.C.R. 3501 (EB 2003); *see also* In re AT&T Wireless Services, Inc., *Notice of Apparent Liability for a Forfeiture*, 17 F.C.C.R. 9903 (EB 2002).

[67] *See* ¶ 182 *infra*.

[68] This modification of Nextel's original White Paper position was first put forth in December 2001 in an *ex parte* filing by the Consensus Parties. *See* n. 172 *infra*. We note that other parties contend that the value of the spectrum rights Nextel seeks substantially exceeds the value of spectrum rights it has offered to give up, and therefore would constitute an unwarranted windfall to Nextel. *See* n. 661 *infra*.

as a result of band reconfiguration. By facilitating band reconfiguration, giving up spectrum rights, and bearing the financial burden of the relocation process for all affected incumbents, Nextel will play a critical role in solving the 800 MHz band public safety interference problem.[69]

32. However, we agree with the parties who have urged us to reject modifying Nextel's licenses on a "megahertz-for-megahertz" basis whereby Nextel would receive rights to ten megahertz of spectrum in the 1.9 GHz band region in exchange for the rights to approximately ten megahertz of combined spectrum it offers to surrender in the 700, 800, and 900 MHz bands.[70] We reject this approach, *inter alia,* because we perceive insufficient benefit to public safety,[71] and do not find the spectrum rights offered to be comparable in value to the spectrum rights sought. Instead, to ensure that the public and our licensees including Nextel are treated equitably, and that Nextel does not gain undue advantage, we will compensate Nextel on a "value for value" basis.

33. Accordingly, by means of a *Fifth Report and Order* in ET Docket No. 00-258 we designate two paired five megahertz blocks in the 1910-1915 MHz and 1990-1995 MHz bands for the provision of new services, including AWS, which we make available to Nextel as part of the public safety rebanding approach described above. In addition, we adopt a *Fourth Memorandum Opinion and Order* in ET Docket No. 95-15 to provide for clearing of incumbents from this spectrum. More specifically:

- We make the 1910-1915 MHz block available by redesignating the band from Unlicensed Personal Communications Services (UPCS) use to licensed fixed and mobile services to be used for AWS, and adopt a plan that provides reimbursement compensation to UTAM for relocation expenses it has incurred in relocating incumbents from the band and allows for the relocation of remaining incumbent licensees.

- In the 1990-1995 MHz block, which has already been reallocated for fixed and mobile services, we make the band available to Nextel subject to the condition that it relocate incumbent BAS licensees in the 1990-2025 MHz band within thirty months.[72] We also address several petitions for reconsideration and clarification regarding the existing relocation and reimbursement plan for incumbent BAS licensees in the 1990-2025 MHz band.

34. Nextel will receive rights to the 1.9 GHz band spectrum conditioned on its meeting the obligations imposed by this *Report and Order,* and on its payment to the U.S. Treasury of any difference

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[69] We provide this compensation under the authority granted us by Sections 4, 301, 303 and 316 of the Act, 47 U.S.C. §§ 316, 303, 301, and 154(i). We set forth a detailed description of our legal authority in ¶¶ 62-87 *infra.*

[70] *See, e.g.,* Comments of Access Spectrum to Supplemental Comments of Consensus Parties at 11-12; Comments of Boeing to Supplemental Comments of Consensus Parties at 19; Comments of CTIA to Supplemental Comments of Consensus Parties at 15-16.

[71] We note that the Commission has previously designated twenty-four megahertz of spectrum to public safety in the 700 MHz band. *See* ¶ 40 *infra.* We note that a "megahertz for megahertz" comparison of the spectrum currently held by Nextel and the spectrum it seeks is unjustified, *inter alia,* because the bands differ in spectral characteristics, operating parameters, the number and kind of incumbent licensees and the number of markets in which Nextel holds its spectrum. Moreover, under the band reconfiguration plan we adopt today, Nextel may require its 900 MHz band spectrum in order to make up for spectrum it may need to vacate in the 800 MHz band in order to accommodate other ESMR licensees in the ESMR segment of the 800 MHz band. *See* ¶¶ 159-163 *infra.*

[72] If Nextel fails to meet this benchmark, for reasons that Nextel could reasonably have avoided, the Commission will determine whether forfeitures should be imposed and/or whether Nextel licenses, including, but not limited to, its 1.9 GHz licenses, should be revoked.

between the value of 1.9 GHz band spectrum rights and Nextel's costs incurred in reconfiguring the 800 MHz band and clearing the 1.9 GHz band. Specifically, the amount due the U.S. Treasury will be the net of our estimate of the current value of the 1.9 GHz band spectrum rights, discounted by the actual cost of 800 MHz band reconfiguration (including Nextel's own relocation costs), clearing the 1.9 GHz band, and the value of the additional 800 MHz band and 700 MHz band spectrum rights that Nextel will relinquish.

35. At the conclusion of the thirty-six month band reconfiguration process specified herein, but no later than six months thereafter, the following financial reconciliation will be made:

- Nextel will be allotted a $1.607 billion credit[73] for relinquishing rights to an average of 4.5 megahertz of spectrum in the 800 MHz band.
- Nextel will provide the Transition Administrator an accounting of the funds spent:
  - to reconfigure its own systems in the 800 MHz band;[74] and
  - to clear the 1.9 GHz band of incumbents and to reimburse UTAM.
- Nextel will also provide the Transition Administrator an accounting of the funds received as reimbursement for clearing the 1.9 GHz band.
- The Transition Administrator shall provide an accounting of the funds spent to reconfigure the systems of incumbent operators in the 800 MHz band, including its own salary and expenses. This accounting shall include certifications from each relocated licensee that all necessary reconfiguration work has been completed and that Nextel and said licensee agree on the sum paid for such work.
- Upon verification of these accountings, Nextel will be allotted an appropriate credit.
- To the extent that those combined credits total less than the value of the 1.9 GHz band spectrum, Nextel shall be obligated to make a payment to the United States Treasury at the conclusion of the relocation process equal to the difference.
- Within ten days of the calculation of the amount of this payment, the Wireless Telecommunications Bureau will issue a Public Notice specifying the amount that Nextel will pay the United States Treasury If Nextel does not make payment of any amount that it owes within thirty days of issuance of this Public Notice, the amount Nextel owes will be paid from the letter(s) of credit. If the letter(s) of credit do not secure sufficient funds, then the Commission will determine whether forfeitures should be imposed and/or whether Nextel licenses, included, but not limited to its 1.9 GHz licenses, should be revoked.

[73] "Credit," as used in this context, means the amount that will be deducted from the sum that Nextel will be required to deposit with the U.S. Treasury after completion of band reconfiguration. The calculation of the credit is discussed at ¶ 323 *infra*.

[74] Nextel's credit for this category of expenditure shall be strictly limited to those costs absolutely essential to implement band reconfiguration and shall not include any costs for improvement, by way of equipment replacement or otherwise, of the capacity or features of Nextel's infrastructure or subscriber units.

IV. REGULATORY BACKGROUND

A. 800 MHz Band

36. In the mid-1970's, the Commission reallocated spectrum in the 806-947 MHz band for land mobile operations and designated portions of this spectrum for high capacity common carrier mobile communications (*i.e.* cellular systems) and PLMR; and reserve spectrum for future land mobile communications needs.[75] The Commission allotted one-third of the spectrum for conventional operation and the remaining two-thirds for trunked operation.[76] By the close of the 1970's, the Commission had released a portion of reserve 800 MHz spectrum to alleviate spectrum shortages confronting users of conventional channels.[77] In the early 1980's, the Commission adopted rules for the release of the remaining reserve spectrum according to radio service categories and established the 800 MHz Public Safety, B/ILT, and SMR service categories.[78] The specific channel pairs allotted to the various services differ along the U.S. border areas with Mexico and Canada.[79] The Commission did not make contiguous spectrum available to each radio service because technology limitations at that time did not readily accommodate the use of contiguous spectrum at a single base station site.[80] Instead, the channel pairs made available to each radio service were "interleaved" between channels allotted to the other radio services.[81] The Commission provided for inter-category sharing (*i.e.*, sharing between radio services) to permit licensees access to spectrum in instances in which the channels assigned to a licensee's particular

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[75] *See* Inquiry Relative to the Future Use of the Frequency Band 806-960 MHz and Amendment of Parts 2, 18, 21, 73, 74, 89, 91, and 93 of the Rules Relative to Operations in the Land Mobile Service Between 806 and 960 MHz, Docket No. 18262, *First Report and Order and Second Notice of Inquiry*, 19 Rad. Reg. 2d (P&F) 1663 (1970). *See also* Inquiry Relative to the Future Use of the Frequency Band 806-960 MHz and Amendment of Parts 2, 18, 21, 73, 74, 89, 91, and 93 of the Rules Relative to Operations in the Land Mobile Service Between 806 and 960 MHz, Docket No. 18262, *Second Report and Order*, 46 FCC 2d 752 (1974), *reconsidered, Memorandum Opinion and Order*, 51 FCC 2d 945 (1975).

[76] *Id.*

[77] *See* Inquiry Relative to the Future Use of the Frequency Band 806-960 MHz and Amendment of Parts 2, 18, 21, 73, 74, 89, 91, and 93 of the Rules Relative to Operations in the Land Mobile Service Between 806 and 960 MHz, Docket No. 18262, *Order* (on further reconsideration), FCC 78-854 (1978); *aff'd sub nom. NARUC v. FCC*, 525 F.2d 630 (D.C. Cir. 1976), *cert. denied* 425 U.S. 992 (1976).

[78] The initial allotment to public safety was fifty channels. *See* Amendment of Part 90 of The Commission's Rules to Designate Frequencies in the 806-821 and 851-866 MHz Bands for Slow-Growth Land Mobile Radio Systems of Utilities and Public Safety Agencies, PR Docket No. 79-191 *Report and Order*, 48 Rad. Reg. 2d (P&F) 837, FCC 80-663 (1980). This was later increased to seventy channels. *See* Amendment of Part 90 of the Commission's Rules to Release Spectrum in the 806-21/851-866 MHz Bands and to Adopt Rules and Regulations Which Govern Their Use; Amendment of Part 90 of the Commission's Rules to Facilitate Authorization of Wide-Area Mobile Radio Communications Systems; An Inquiry Concerning the Multiple Licensing of 800 MHz Radio Systems (community repeaters); Amendment of Section 90.385(c) of the Commission's Rules to Allow Transmission of Non-Voice Signals at 800 MHz, PR Docket No. 79-191, PR Docket No. 79-334, PR Docket No. 79-107, PR Docket No. 81-703, *Second Report and Order*, 90 FCC 2d 1281, 52 Rad. Reg. 2d (P&F) 11, FCC 82-338 (1982) (*Pool Order*). Subsequently, the Commission added 225 25 kHz channels spaced 12.5 kHz apart and five 25 kHz channels spaced 25 kHz apart at 866-869 MHz—the so-called "NPSPAC Channels." *See* ¶ 37 *infra*.

[79] *See, e.g.*, 47 C.F.R. §§ 90.617, 90.619.

[80] *See NPRM*, 17 FCC Rcd at 4877.

[81] *Id.*

radio service had been exhausted.[82] At the time, the Commission contemplated that the radio service categories could be phased out in three years.[83] However, the categories proved to have continuing utility and remain in use today. In 1986, based on experience with the radio service category structure in the 800 MHz band, the Commission adopted a similar structure for the 900 MHz band land mobile spectrum.[84]

37. In 1986, the Commission designated six megahertz of spectrum at 821-824 MHz/866-869 MHz for public safety use and established the NPSPAC to advise the Commission on rules for this spectrum.[85] After the NPSPAC filed its Initial Report, the Commission issued rules for the new public safety spectrum, which became known as the "NPSPAC Band," including five channels devoted to mutual aid (interoperability) use.[86] Thereafter, many jurisdictions began planning and implementing wide-area (often state-wide) 800 MHz band public safety systems that utilize NPSPAC and Public Safety Category channels.[87]

38. In 1990, the Commission established the General Category Radio Service at 806-809.75 MHz/851-854.75 MHz for either conventional or trunked operation by any eligible 800 MHz licensee.[88] A year later, the Commission waived its rule requiring SMR licensees to complete system construction in one year, to accommodate SMR licensees' interest in accumulating large numbers of 800 MHz channels and using advanced technology to increase spectrum reuse by employing cellular-type architecture to

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[82] *Id.*

[83] *See Pool Order,* 90 FCC 2d 1303-1304 ¶ 66. In 1995, the Commission imposed a freeze on intercategory sharing, because, after the Commission elected to auction SMR licenses on a wide-area geographical basis, SMR applicants filed a disproportionate number of requests for intercategory sharing. *See* Amendment of Part 90 Of The Commission's Rules To Facilitate Future Development Of SMR Systems in the 800 MHz Frequency Band, PR Docket No. 93-144, *Second Report and Order,* 12 FCC Rcd 19079 (1997). This resulted in a shortage of channels for applicants in the other pools. *See* in the Matter Of Inter-Category Sharing Of Private Mobile Radio Frequencies in the 806-821/851-866 MHz Bands, *Order,* 10 FCC Rcd 7350 (WTB 1995) (*Intercategory Freeze Order*). To date, the freeze on intercategory sharing in the 800 MHz band remains in effect.

[84] *See* Amendment of Parts 2 and 22 of the Commission's Rules Relative to Cellular Communications Systems Amendment of Parts 2, 15, and 90 of the Commission's Rules and Regulations to Allocate Frequencies in the 900 MHz Reserve Band for Private Land Mobile Use Amendment of Parts 2, 22 and 25 of the Commission's Rules to Allocate Spectrum for, and to Establish Other Rules and Policies Pertaining to the Use of Radio Frequencies in a Land Mobile Satellite Service for the Provision of Various Common Carrier Services, GEN Docket No. 84-1231 RM-4812, GEN Docket No. 84-1233 RM-4829, GEN Docket No. 84-1234, *Report and Order,* 2 FCC Rcd at 1825 ¶ 46 (1986).

[85] *Id.* at 1837.

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

[87] *See, e.g.,* State of Ohio, *Memorandum Opinion and Order,* 17 FCC Rcd 439 (WTB, PS&PWD 2002); State of Florida, *Memorandum Opinion and Order,* 16 FCC Rcd 2174 (WTB 2001); Commonwealth of Pennsylvania and GPU Energy, *Order,* 14 FCC Rcd 14029 (WTB, PS&PWD 1999); New Jersey Transit Authority, *Order,* 14 FCC Rcd 4334 (WTB 1999); State of South Carolina and Scana Communications, Inc., *Order,* 13 FCC Rcd 8787 (WTB 1997); State of Florida, *Order,* 12 FCC Rcd 11567 (WTB 1997); Seminole County, Florida, *Order,* 11 FCC Rcd 4105 (WTB 1996).

[88] *See* Trunking in the Private Land Mobile Radio Services for More Effective and Efficient Use of the Spectrum, PR Docket No. 87-213, *Report and Order,* 5 FCC Rcd 4016 (1990).

efficiently serve wide areas and large numbers of subscribers.[89] Thereby, it afforded Fleet Call, the predecessor of Nextel, sufficient time to develop and implement an SMR system offering wide-area digital voice and data service.[90]

39. In 1994, the Commission proposed a new licensing framework for SMR systems in the 800 MHz band.[91] After release of the *Further Notice*, there was a significant increase in the number of requests for General Category channels made by SMR applicants and licensees.[92] On October 4, 1995, the Wireless Telecommunications Bureau imposed a freeze on acceptance of new applications for the General Category channels to ensure that resolution of the spectrum allocation issues raised in the *Further Notice* would not be compromised.[93] In December 1995, the Commission established geographic area licensing and new service rules for the "upper 200" 800 MHz SMR channel pairs at 816-821 MHz/861-866 MHz where such wide-area digital voice and data services eventually proliferated.[94] The Commission subsequently redesignated the General Category channels exclusively to the 800 MHz SMR service, whereby mutually exclusive initial applications would be subject to competitive bidding, and excluded PLMR licensees from eligibility for this spectrum.[95] On reconsideration, however, the Commission reversed its decision concerning eligibility and reinstated the eligibility of PLMR applicants for General Category channels.[96] The Commission also partially lifted the freeze on General Category channels to permit Economic Area (EA) applicants[97] to relocate incumbents from the upper ten megahertz block of

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[89] *See NPRM*, 17 FCC Rcd at 4878 ¶ 9.

[90] *See, e.g.*, Fleet Call, Inc, *Memorandum Opinion and Order*, 6 FCC Rcd 1533, *recon. dismissed*, 6 FCC Rcd 6989 (1991).

[91] Amendment of Part 90 of the Commission's Rules to Facilitate Future Development of SMR Systems in the 800 MHz Frequency Band, *Further Notice of Proposed Rule Making*, PR Docket No. 93-144, PP Docket No. 93-253, 10 FCC Rcd 7970 (1994) (*Further Notice*).

[92] The General Category is comprised of 150 contiguous twenty-five megahertz channels in the 800 MHz band. *See* 47 C.F.R. § 90.615.

[93] Licensing of General Category Frequencies in the 806-809.750/851-854.750 MHz Bands, *Order*, 10 FCC Rcd 13190 (WTB 1995).

[94] *See* Amendment of Part 90 of the Commission's Rules to Facilitate Future Development of SMR Systems in the 800 MHz Frequency Band, PR Docket No. 93-144, *First Report and Order, Eighth Report and Order, and Second Further Notice of Proposed Rule Making*, 11 FCC Rcd 1463 (1995) (*800 MHz Report and Order*). Geographic licensing was also adopted for the General Category SMR channels.

[95] Amendment of Part 90 of the Commission's Rules to Facilitate Future Development of SMR Systems in the 800 MHz Frequency Band, *First Report and Order, Eighth Report and Order and Second Further Notice of Proposed Rulemaking*, PR Docket No. 93-144, GN Docket No. 93-252, PP Docket No. 93-253, 11 FCC Rcd 1463 (1995) (*800 MHz SMR Report and Order); Memorandum Opinion and Order on Reconsideration*, PR Docket No. 93-144, GN Docket No. 93-252, PP Docket No. 93-253, 12 FCC Rcd 9972 (1997) (*800 MHz SMR Memorandum Opinion and Order*).

[96] *800 MHz SMR Memorandum Opinion and Order*, 12 FCC Rcd at 9975 ¶ 4.

[97] In the *800 MHz SMR Report and Order*, the Commission adopted geographic licensing based on EAs for the upper ten megahertz of the 800 MHz SMR service. *See 800 MHz SMR Report and Order*, 11 FCC Rcd at 1484 ¶¶ 24-25. The U.S. Department of Commerce Bureau of Economic Analysis has established 172 EAs which cover the continental United States. *See* Final Redefinition of the BEA Economic Areas, 60 Fed. Reg. 31114 (Mar. 10, 1995).

800 MHz spectrum to the General Category channels.[98] In all other respects, the Commission maintained the freeze so as not to frustrate its efforts regarding future licensing of General Category channels.[99]

B. 700 MHz Band

40. Prior to 1997, the 700 MHz band (TV Channels 60-69) was exclusively used by broadcasters. In the Balanced Budget Act of 1997, Congress directed the Commission to reallocate twenty-four megahertz of this spectrum for public safety use and to auction thirty-six megahertz of this spectrum for commercial use.[100] Incumbent analog television stations on the 700 MHz band frequencies are allowed to remain in operation until December 31, 2006, and, under certain circumstances, well beyond that date.[101] These stations render the 700 MHz band unusable for public safety systems in the majority of metropolitan areas at this time.

41. In January 2000, the Commission established two paired 700 MHz guard bands (the 700 MHz Guard Bands), one of four megahertz and one of two megahertz, in the commercial use spectrum immediately adjacent to the public safety spectrum to insulate public safety operations from unacceptable interference from 700 MHz commercial services.[102] In the *Upper 700 MHz Second Report and Order*, the Commission adopted technical, operational, and licensing requirements for the 700 MHz Guard Bands,[103] including a ban on cellular operations.[104] The Commission's restriction on cellular operations stems from its experience in the 800 MHz land mobile band in which the incompatibility of "high-site" operations and cellular operations led to the instant rule making.[105] The Commission determined that the 700 MHz Guard Bands would be licensed by competitive bidding to a new class of commercial user called a Guard Band Manager who would lease the spectrum for value to third parties on a for-profit basis.[106] The Commission

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[98] *See 800 MHz SMR Report and Order*, 11 FCC Rcd at 1508 ¶¶ 74-75.

[99] *Id.* at 1509 ¶ 76.

[100] *See* Section 337(a) of the Act, 47 U.S.C. § 337(a), as amended by § 3004 of the Balanced Budget Act of 1997, Pub. L. No. 105-33, 111 Stat. 251 (1997). The Commission's Wireless Telecommunications Bureau subsequently set a June 19, 2002, date for this auction. *See* Auction of Licenses in the 747-762 and 777-792 MHz Bands (Auction Nos. 31 and 44) scheduled for June 19, 2002, DA 01-2394, *Public Notice*, 16 FCC Rcd 18510 (2001). The spectrum assigned for public safety use corresponds to Television Channels 63-64 and 68-69.

[101] *See* 47 U.S.C. §§ 309(j)(14) and 337(e). *See also* Advanced Television Systems and Their Impact Upon Existing Television Broadcast Service, MM Docket No. 87-268, *Reconsideration of Fifth Report and Order*, 13 FCC Rcd 6860, 6887 (1998).

[102] The Guard Bands consist of paired one megahertz sub-bands at 746-747 MHz and 776-777 MHz and two paired two megahertz sub-bands at 762-764 MHz and 792-794 MHz. *See* 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, *First Report and Order*, 15 FCC Rcd 476, 489-91 ¶¶ 30-34 (2000) (*Upper 700 MHz First Report and Order*).

[103] *See* 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, *Second Report and Order*, 15 FCC Rcd 5299 (2000) (*Upper 700 MHz Second Report and Order*).

[104] *See* 47 C.F.R. §§ 27.2(b); 27.601(a).

[105] *See Upper 700 MHz Second Report and Order*, 15 FCC Rcd 5299.

[106] *Upper 700 MHz Second Report and Order*, 15 FCC Rcd at 5311-13 ¶¶ 26-28. The Commission determined that this licensing scheme was consistent with the provisions of 47 U.S.C. § 337(a)(2) requiring that this (continued....)