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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

BY HAND

Magalie Roman Salas, Secretary
Federal Communications Commission
445 Twelfth Street, S.W.
Washington, D.C. 20554

Re: ET Docket Nos. 00-258 and 95-18
IB Docket No. 99-81
WT Docket No. 99-87
Ex Parte Presentation

Dear Ms. Salas:

On November 21, 2001, Nextel Communications, Inc. ("Nextel") submitted to Thomas J. Sugrue, Chief of the Wireless Telecommunications Bureau, the attached White Paper, "Promoting Public Safety Communications: Realigning the 800 MHz Land Mobile Radio Band to Rectify Commercial Mobile Radio – Public Safety Interference and Allocate Additional Spectrum to Meet Critical Public Safety Needs," and the attached transmittal letter to the White Paper, signed by Robert S. Foosaner, Senior Vice President and Chief Regulatory Officer of Nextel.

Copies of this White Paper and transmittal letter were also delivered to Chairman Michael K. Powell; Commissioner Kathleen Q. Abernathy; Commissioner Michael J. Copps; Commissioner Kevin J. Martin; Robert Pepper, Chief of the Office of Plans and Policy; Donald Abelson, Chief, International Bureau; Bruce A. Franca, Acting Chief, Office of Engineering and Technology; Julius Knapp, Deputy Chief, Office of Engineering and Technology; Kathleen O'Brien Ham, Deputy Chief, Wireless Telecommunications Bureau; and D'wana Terry, Chief, Public Safety and Private Wireless Division of the Wireless Telecommunications Bureau.

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Pursuant to section 1.1206(b)(1) of the Commission's rules, 47 C.F.R. § 1.1206(b)(1), an original and two copies of this letter are being provided to you for inclusion in the public record of the above-referenced proceedings.

Sincerely,

Regina M. Keeney

Regina M. Keeney
Counsel to Nextel Communications, Inc.

cc: Thomas J. Sugrue
Chairman Michael Powell
Commissioner Kathleen Abernathy
Commissioner Michael Copps
Commissioner Kevin Martin
Robert Pepper
Donald Abelson
Bruce Franca
Julius Knapp
Kathleen O'Brien Ham
D'wana Terry

Nextel Communications, Inc.
2001 Edmund Halley Drive, Reston, VA 20191

NEXTEL®

November 21, 2001

Mr. Thomas J. Sugrue
Chief, Wireless Telecommunications Bureau
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

Re: Eliminating CMRS-Public Safety Interference in the 800 MHz Band and Allocating Additional Spectrum to Meet Critical Public Safety Communications Needs

Dear Mr. Sugrue:

Nextel Communications, Inc. ("Nextel") hereby submits the attached White Paper, "Promoting Public Safety Communications: Realigning the 800 MHz Land Mobile Radio Band to Rectify Commercial Mobile Radio – Public Safety Interference and Allocate Additional Spectrum to Meet Critical Public Safety Needs." The White Paper recommends that the Federal Communications Commission (the "Commission") initiate expeditiously a rulemaking proceeding to accomplish two pressing public interest goals: (1) making additional spectrum available for public safety communications services; and (2) substantially reducing interference to public safety communications from the operations of Commercial Mobile Radio Service ("CMRS") systems in the 800 MHz band.

Nextel shares the 800 MHz band with Public Safety communications systems, Business/Industrial Land Transportation ("B/ILT") licensees, Specialized Mobile Radio ("SMR") operators and Cellular Radiotelephone ("cellular") systems. Cellular licensees occupy the upper portion of the 800 MHz band directly adjacent to public safety communications systems. Nextel, other SMRs, B/ILT, and Public Safety systems are licensed in the 36 MHz of Land Mobile Radio spectrum at 800 MHz adjacent to the cellular licensees. Nextel is the leading commercial licensee in the Land Mobile Radio band with licenses for more than 18 MHz of this spectrum.

Over the past two years, Nextel has worked with the public safety community to identify why CMRS operations are interfering with public safety communications systems in the 800 MHz band, even though all licensees are in compliance with the Commission's rules and the terms and conditions of their licenses. Typically, interference occurs in the immediate vicinity of CMRS base stations operated by either

the cellular licensees or advanced SMRs using digital, cellular-like network architecture. Public safety communications operators in about 25 metropolitan areas have experienced this type of interference, often near multiple CMRS base stations. Interference can disrupt critical life safety communications with police officers, firefighters, rescue teams and other emergency response personnel, potentially putting them at risk as well as the public they serve. Mitigating these risks is essential and has become even more urgent in the aftermath of the September 11, 2001 terrorist attacks on our country.

Last January, Nextel and the Association of Public Safety Communications Officials, Motorola, Inc., the Cellular Telecommunications and Internet Association and the Public Safety Wireless Network presented to the Commission a "Best Practices Guide" that identified the causes of CMRS – public safety interference and presented both mitigation alternatives and prior coordination plans to prevent interference. As discussed therein, the fundamental cause of this interference is an 800 MHz spectrum allocation plan, initially adopted in 1974, that has failed to keep pace with the dynamic nature of the wireless telecommunications marketplace. It results in the Commission authorizing public safety communications providers and CMRS licensees to operate essentially incompatible systems on mixed, interleaved and adjacent 800 MHz channels. The locally stronger transmissions of CMRS systems "overpower" less robust, distant public safety signals -- a signal strength disparity that under certain circumstances causes interference in the front end of public safety receivers. Intermodulation is the dominant cause of interference, with wideband noise and receiver overload playing a secondary role.

Nextel has devoted substantial resources to identifying the causes of CMRS – public safety interference and developing both immediate and long-term corrective measures. This White Paper urges the Commission to implement an effective, long-term solution: an 800 MHz spectrum realignment to relocate public safety and CMRS systems to separate spectrum blocks, thereby eliminating the mixed licensing of incompatible system designs that is the underlying cause of CMRS – public safety interference. It would establish a 20 MHz spectrum block for public safety communications – more than doubling the current public safety allocation of 9.5 MHz at 800 MHz -- and a separate 16 MHz spectrum block dedicated to advanced, frequency reuse digital SMR networks. The proposed public safety channel block would be adjacent to television channels 68 and 69, which have already been allocated for use by public safety communications systems, ultimately creating a near-contiguous 44 MHz channel block dedicated to public safety communications uses. B/ILT licensees currently operating on the new public safety block would become secondary and would be permitted to relocate to spectrum in the 700 MHz and 900 MHz bands on a voluntary first-come, first-served basis.

To implement the proposed band plan, Nextel would swap 16 MHz of spectrum it currently holds in the 700, 800, and 900 MHz bands; 8 MHz of this spectrum is in the 800 MHz band and would be reallocated to the new public safety spectrum block, while

the other 8 MHz of spectrum is in the 700 and 900 MHz bands and would be used to relocate B/ILT licensees and high site SMR licensees currently operating in the 800 MHz band. In exchange, the Commission would grant Nextel licenses for 6 MHz of replacement spectrum in the new digital SMR channel block at 800 MHz (contiguous to the 10 MHz already licensed to Nextel in this block), and 10 MHz of unused contiguous spectrum reallocated for terrestrial commercial use in the 2 GHz Mobile Satellite Service ("MSS") band. No incumbent licensee would lose any spectrum, and public safety operators would obtain additional, critically needed spectrum for increased capacity, advanced services and enhanced interoperability.

Nextel is willing to contribute up to $500 million to help fund the costs of relocating incumbent 800 MHz public safety systems in accordance with the realigned band plan. It would also fund its own significant relocation requirements. Nextel would provide these funds contingent upon: (1) the FCC's adoption of the proposed realignment plan by a Final Order; and (2) the assignment to Nextel of licenses for 6 MHz in the new 800 MHz digital SMR band (in addition to the licenses Nextel currently holds in that band) and for the 10 MHz, 2020/2025 – 2170/2175, from the MSS band in exchange for the 16 MHz of spectrum Nextel would surrender as part of the plan. The cellular operators, and all other CMRS licensees that will benefit from the proposed realignment, should contribute substantially to the costs of relocating public safety licensees.

The White Paper proposal will help police, firefighters, and other public safety agencies meet the unprecedented challenges they now face in protecting our nation's security, while enhancing the spectral operating environment for public safety and CMRS licensees. The Commission should expeditiously commence a rulemaking proceeding to advance these vital public interest measures.

Respectfully submitted,

NEXTEL COMMUNICATIONS, INC.

Robert S. Foosaner
Senior Vice President and
Chief Regulatory Officer

Lawrence R. Krevor
Vice President – Government Affairs

2001 Edmund Halley Drive
Reston, VA 20191
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Enclosure

cc: Chairman Michael Powell
Commissioner Kathleen Abernathy
Commissioner Michael Copps
Commissioner Kevin Martin
Robert Pepper
Donald Abelson
Bruce Franca
Julius Knapp
Kathleen O'Brien Ham
D'wana Terry

PROMOTING PUBLIC SAFETY COMMUNICATIONS

REALIGNING THE 800 MHz LAND MOBILE RADIO BAND TO RECTIFY COMMERCIAL MOBILE RADIO – PUBLIC SAFETY INTERFERENCE AND ALLOCATE ADDITIONAL SPECTRUM TO MEET CRITICAL PUBLIC SAFETY NEEDS

Nextel Communications, Inc.

2001 Edmund Halley Drive
Reston, VA 20191

November 21, 2001

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I. INTRODUCTION

This White Paper recommends that the Federal Communications Commission ("FCC" or "Commission") expeditiously commence a rulemaking proceeding to correct the causes of interference between commercial wireless and public safety radio communications systems in the 800 MHz band. As part of this initiative, the Commission should allocate additional spectrum at 800 MHz for public safety communications systems vital to the safety of life and property and our nation's security. Specifically, the Commission should realign the 36 MHz of 800 MHz Land Mobile Radio spectrum, 806/824 - 851/869 MHz, to mitigate radio frequency ("RF") interference between Commercial Mobile Radio Systems ("CMRS") and Public Safety Radio Communications Systems and to double the amount of 800 MHz spectrum available for primary use by public safety communications systems.

Since 1996, the FCC has been seeking solutions to the various communications problems faced by the public safety community, including inadequate spectrum access and barriers to interoperability.[1] The Commission has acknowledged that public safety agencies have "scarce available spectrum," particularly in large metropolitan areas,[2] and recently received a petition reiterating public safety's critical need for additional spectrum to meet the communications challenges of this decade.[3] Public safety providers need additional spectrum *now* to enhance

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[1] *In the Matter of the Development of Operational, Technical, and Spectrum Requirements for Meeting Federal, State, and Local Public Safety Agency Communications Requirements Through the Year 2010*, Notice of Proposed Rulemaking, 11 FCC Rcd 12460, ¶ 1 (1996).

[2] *Id. See also In the Matter of the Development of Operational, Technical, and Spectrum Requirements for Meeting Federal, State, and Local Public Safety Agency Communications Requirements Through the Year 2010,* First Report and Order and Third Notice of Proposed Rulemaking, 14 FCC Rcd 152, ¶ 24 (1998) ("*First Report and Order*").

[3] *See* Petition for Rule Making by the Public Safety Wireless Network ("PSWN") to Promote Allocation of Spectrum for Public Safety Agencies and Other Matters to Address Communications Needs Through 2010, filed September 14, 2001 (the "PSWN Petition").

interoperability among police, fire, rescue and emergency management personnel, provide advanced video and data communications services, increase systems capacity for both life safety and public works uses, and improve communications reliability and redundancy.

There is also a critical need to implement an effective, long-term solution to the increasing levels of CMRS - public interference in the 800 MHz band. The CMRS industry and the public safety community, along with the FCC staff, have worked together over the past two years to identify the causes of this interference. These efforts have determined that the fundamental cause of the problem is the increasingly incompatible mix of mobile communications licensees in the 800 MHz band. Mitigating CMRS – public safety interference requires, among other things, realigning the 800 MHz Land Mobile Radio spectrum so that public safety and commercial services operate in separate contiguous spectrum blocks.

To achieve these essential public interest objectives, the Commission should immediately initiate a rulemaking proceeding with the goal of adopting the necessary rule changes within six months. This realignment plan will affect many users of this spectrum, including Specialized Mobile Radio systems ("SMR"), Business Radio and Industrial/Land Transportation Radio ("B/ILT") systems and Public Safety Communications systems. It will also affect and substantially benefit Cellular Radio Telecommunications ("cellular") systems. Although these actions will impose short-term costs on the affected parties, no private radio or commercial licensee will experience a net gain or loss in the amount of spectrum it currently holds. These parties will benefit in the long-term because they will be relieved of the burdens associated with ongoing coordination requirements, including operating restrictions and channel deployment limitations necessary to protect public safety communications systems from interference. Additionally, although it is not necessary to relocate cellular licensees in the upper portion of the

800 MHz band, 824/849 – 869/894 MHz, these licensees increasingly are the cause of CMRS – public safety interference and will need to undertake mitigation responsibilities to help achieve an effective, long-term solution to CMRS – public safety interference. The proposed realignment offers an equitable approach in which all involved categories of licensees would share the benefits and burdens in implementing a solution that enables public safety providers to serve the public more effectively and more reliably.

Public safety agencies are facing enormous challenges in light of the recent terrorist attacks on our nation. As PSWN has observed, the "tragic events of September 11, 2001 have underscored the need for public safety response and coordination on a massive, unprecedented scale."[4] Congress has recently emphasized the need to address this challenge,[5] and the FCC has just announced the creation of a Homeland Security Policy Council composed of senior staff officials from throughout the Commission. The Council is charged with ensuring "that public safety, health and other emergency and defense personnel have effective communications available to them to assist the public as needed."[6] The actions recommended by this White Paper – realigning the 800 MHz Land Mobile Radio band and the allocation of an additional 10 MHz of readily useable spectrum for public safety services – will address these critical needs.

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[4] PSWN Petition at 4.

[5] For instance, Senator James Jeffords of Vermont, Chairman of the Environment and Public Works Committee, recently introduced and then steered through his committee a bill (S. 1631) that would mandate a 90-day federal study of the "resources that are needed for development of an effective nationwide communications system for emergency response personnel." The need for new resources was recognized even before September 11. On July 13, 2001, for instance, twelve members of the U.S. House of Representatives sent a letter to the Chairman and Ranking Member of the House Subcommittee on Commerce, Justice, State and Judiciary Appropriations requesting $2 million to aid in the development of a county-wide interoperable public safety communications network for Los Angeles County.

[6] "Federal Communications Commission Announces Creation of Homeland Security Policy Council," released November 14, 2001.

II. EXECUTIVE SUMMARY

A. The Problem

This White Paper explains the reasons for the increasing incidence of CMRS – public safety interference in the 800 MHz band. Public safety and CMRS systems are operating essentially incompatible wireless system designs on adjacent, interleaved and mixed 800 MHz channels. The result is interference to public safety communications in the vicinity of CMRS base stations -- *even though all licensees are operating in compliance with the FCC's rules and the terms and conditions of their FCC licenses.* In addition, public safety communicators have an urgent need for additional spectrum in the near-term to support enhanced and improved communications to protect life, property and national security. This White Paper concludes that, to make additional spectrum available for Public Safety at 800 MHz and solve CMRS – public safety interference, some 800 MHz incumbents must move from their current channel assignments.

B. The Solution

The optimum solution is to realign the 36 MHz of 800 MHz public safety/CMRS spectrum by creating two separate (adjacent) contiguous channel blocks: 20 MHz to Public Safety (channels 1 – 400), and 16 MHz (channels 401 – 720) to commercial digital wireless networks. Public safety is currently allocated 9.5 MHz at 800 MHz; this proposal would more than double public safety's allocation to 20 MHz. To clear space for the public safety block, Nextel (the predominant incumbent commercial licensee with 18 MHz at 800 MHz) would relocate its licenses in channels 1 - 400 (8+ MHz of the total 20 MHz) to other spectrum at its own cost. Nextel will also contribute its 700 MHz Guard Band (4 MHz) and 900 MHz SMR licenses (4 of the 5 MHz SMR allocation at 900 MHz) to make spectrum available for relocating

800 MHz B/ILT incumbents and high-site (non-cellular) SMR incumbents from the new public safety block.

In return for the 16 MHz Nextel would contribute for these purposes, Nextel would be licensed replacement spectrum as follows: (1) 6 MHz at 821/824 – 866/869 MHz (the current NPSPAC channels) made available by consolidating and expanding the Public Safety spectrum in channels 1-400; and (2) a 10 MHz contiguous block from the reserve Mobile Satellite Service ("MSS") spectrum at 2.1 GHz, reallocated for terrestrial CMRS service and licensed to Nextel on a nationwide basis.

Incumbent B/ILT and non-cellular SMRs could remain at 800 MHz in the new public safety block on a secondary, non-interference basis where that arrangement is possible and desired by the parties, *i.e.,* tertiary and rural markets, or temporarily until public safety entities need the spectrum. The Commission should, however, create incentives for B/ILT and non-cellular SMRs to relocate expeditiously to the vacant 700 MHz or 900 MHz channels.

The 6 MHz of NPSPAC channels, in combination with the 10 MHz (816/821 - 861/866) already licensed for advanced technology SMR systems, would become a 16 MHz low power, low-site, digital SMR channel block. Nextel would move its operations in the new public safety block to this advanced SMR block, as would any other digital advanced SMR incumbent licensee in the new public safety block.

Nextel would commit to fund up to $500 million of the costs of relocating incumbent 800 MHz public safety incumbents -- primarily from the NPSPAC channels to channels 1 – 400. Cellular operators should also contribute to public safety retuning costs, as should other CMRS licensees benefiting from the proposed 800 MHz realignment.

C. Public Interest Benefits

Realigning the 800 MHz band would rationalize the current spectrum hodgepodge that fundamentally causes CMRS – public safety interference, thereby creating the spectrum allocations that make it possible ultimately to virtually eliminate CMRS – public safety interference on a nationwide, long-term basis. It would more than double the public safety spectrum allocation at 800 MHz from 9.5 MHz of interleaved channels to 20 MHz of contiguous spectrum -- providing near-term spectrum relief in a band where equipment is readily available and that is adjacent to the future 700 MHz public safety channel block. No private or commercial licensee would experience a net gain or loss of spectrum, but all would be relieved of current interference-related burdens and have greater freedom to expand their networks in the future.

III. NEXTEL'S INTEREST IN THE REALIGNMENT PROPOSAL

As the predominant commercial licensee in the 800 MHz Land Mobile Radio band, Nextel holds numerous geographic area and site-by-site licenses that are adjacent to, interleaved with and mixed among public safety communications license assignments. Nextel is the fifth largest CMRS carrier in the nation, providing a unique combination of cellular, short messaging, internet access, data transmission and Direct Connect® -- a digital two-way radio feature that enables subscribers to reach other Nextel customers with the push of a button even if they are hundreds of miles away. As Nextel expands its network to provide enhanced coverage and increased capacity to serve its more than eight million customers, it finds itself unintentionally causing, along with other CMRS licensees, interference to public safety communications in a number of major metropolitan areas around the nation. Given its position as the primary

incumbent CMRS licensee in the Land Mobile Radio band, any realignment or consolidation of the 800 MHz public safety or commercial spectrum will require Nextel's cooperation.

Nextel submits this White Paper proposing a plan for 800 MHz realignment because it establishes the basis for an effective, long-term solution to CMRS – public safety interference. Nextel has expended significant staff and financial resources to mitigate interference to public safety communications on a case-by-case basis, including voluntarily agreeing to limit use of its licensed frequencies at certain sites, reducing power, reorienting antennas and similar measures. It has taken these actions voluntarily to safeguard the reliability of public safety communications, and thus the safety of emergency response personnel and the public they protect, even though Nextel is operating in full compliance with the FCC's rules and regulations.

Cellular licensees are also a source of interference to public safety systems and are finding it necessary to take similar actions to alleviate CMRS – public safety interference. As discussed herein, cellular A-band operators are causing interference to public safety communications in cities across the nation; in some cases, B-band cellular operators contribute to the interference. It is very difficult to coordinate the dynamic frequency reuse plans of multiple cellular-type commercial providers to protect nearby public safety communications systems from interference on a case-by-case basis.[7] This approach imposes considerable burdens on all affected licensees and is limited in its effectiveness. Moreover, the burdens and difficulties of case-by-case remediation will only increase as all 800 MHz systems – both commercial and

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[7] In fact, as discussed *infra,* "mature" cellular systems use advanced dynamic frequency assignment algorithms that may not be able to account for CMRS – public safety interference. Even worse, cellular systems using advanced, digital broadband transmission technologies, such as CDMA, may not be able to eliminate specific channels that create interference.

public safety – evolve to meet expanding demand for enhanced wireless communications services.

For all of these reasons, Nextel proffers the proposed realignment plan as a means of alleviating CMRS – public safety interference by implementing a rational band plan for 800 MHz Land Mobile Radio use. This plan would correct the spectrum allocation and licensing practices that are at the root of the CMRS – public safety interference problem while providing growth opportunities for affected public safety, CMRS, B/ILT and high-site SMR systems. Nextel is also willing to contribute a substantial amount of spectrum as well as financial and human resources to the plan's implementation. Nextel would gain no additional spectrum under the proposed realignment plan; in fact, Nextel would incur a net loss of approximately 0.5 MHz of spectrum. In exchange for the substantial contribution it is willing to make to the proposed plan, Nextel would be relieved of the burdens and risks involved in its current efforts to address CMRS - public safety interference. Nextel would also benefit by replacing its channel assignments in the 700 MHz, 800 MHz, and 900 MHz bands with two blocks of contiguous spectrum: 16 MHz at 800 MHz (of which Nextel is already licensed for a 10 MHz contiguous block) and 10 MHz at 2.1 GHz reallocated from the MSS band that has not been assigned to any MSS licensee.

IV. BACKGROUND

A. The Current 800 MHz Band Plan

Over the past 30 years, the Commission has allocated spectrum for and licensed a variety of wireless communications services at 800 MHz. Communications services in this band include public safety communications systems – the radio networks used by police, fire and rescue personnel – as well as other state and local governmental services. They include the private

systems licensed to businesses and industrial facilities to provide internal network wireless communications in and around manufacturing plants and for businesses. The 800 MHz spectrum is also home to commercial wireless providers, including the two cellular licensees in each local market and SMR licensees. These commercial providers compete, along with Personal Communications Service ("PCS") providers, to offer Americans a variety of competitively priced wireless communications services that have become an essential part of contemporary life.

The current 800 MHz band plan dates back to 1974, when the Commission reallocated former UHF television channels 70 – 83, and 35 MHz of federal government spectrum, to Land Mobile Radio Systems.[8] It earmarked 40 MHz of this spectrum for cellular systems, 30 MHz for conventional and trunked radio systems, and held the remainder in reserve.[9] Under this technology-based allocation, applicants desiring to operate *conventional* land mobile radio systems could apply for channels from the 100 channel conventional service allocation, regardless of whether the applicant planned to provide communications support to public safety providers, a private network, or commercial wireless services to third parties.[10] An applicant intending to operate *trunked* systems could apply for 5, 10, 15 or 20 channel groups from the upper 200 trunked channel allocation, again without regard to whether the applicant would use

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[8] *See* Exhibit A for a series of charts depicting the evolution of the 800 MHz Land Mobile Radio spectrum band plan from 1974 to the present. *See also* An Inquiry into the Future use of the Frequency Band 806-960 MHz, *Second Report and Order*, 46 FCC 2d 752 (1974) ("*1974 Licensing Order*").

[9] *See id.* at ¶¶ 12, 17. In a trunked system, two or more channels are linked with a computer that automatically assigns the first available channel to a user. In a conventional system, channel access is manually controlled and each user must search manually for a vacant channel. Conventional systems were simpler and cheaper to operate, but trunking is a more efficient technology because it allows a greater number of mobiles to be accommodated on the same number of channels.

[10] *See id.* at 767-78, ¶ ¶ 45-48.

them in a private business network, offer for-profit commercial services, or dedicate its network to supporting police, fire, rescue and other public safety or public works services.

Given existing technological capabilities in 1974, system designers feared that the channels used in a multiple channel network would interfere with each other. Since 1974, therefore, the FCC's overriding concern in licensing 800 MHz land mobile trunked systems (and in assigning additional channels to conventional systems) has been to prevent interference between providers or users of the same communications service ("intrasystem interference") by assigning channels one megahertz apart, rather than assigning contiguous channels.[11] Until recently, the Commission believed that interference between providers or users of different communications services ("intersystem interference") would not be a problem in its 800 MHz spectrum allocation and channel assignment decisions.[12]

As a result, 800 MHz commercial land mobile radio licenses are not contained in discrete, separate blocks or sub-bands, as is the case for cellular and PCS licensees, but are spread almost randomly throughout the land mobile band, separated only by co-channel base station distance requirements. Public safety, B/ILT and commercial providers are interleaved, mixed and adjacent to each other creating a hodgepodge of different types of service providers – sometimes sharing the same channels (but separated by specified co-channel distances), and sometimes using adjacent channels. The fact that the cellular allocation is adjacent to the NPSPAC channels creates an even more complicated mix of spectrum uses and technologies and further exacerbates the potential for interference. This situation posed no apparent problems

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[11] For example, a five-channel trunked system would be assigned channels 401, 441, 481, 521 and 561. This exacerbated the scrambling of different licensees on adjacent, near-adjacent and even the same channels (with specified co-channel separation) throughout the 806/821 – 851/866 MHz portion of the 800 MHz band.

[12] *See 1974 Licensing Order* at 772-73, ¶¶ 71-73.

when all licensees were using the same technology; *i.e.*, a few high-power, high-site transmitters serving an entire metropolitan area. CMRS licensees, however, have now adopted more efficient system architectures that employ multiple base stations and frequency reuse techniques to achieve the network capacity to meet growing consumer demand for their services. As described in section V.A. below, the use of these differing system architectures in the 800 MHz band has created locally disparate signal strengths that, under certain circumstances, cause interference to public safety communications systems.

B. CMRS-Public Safety Interference in the 800 MHz Band

In the past few years, there have been numerous reports regarding CMRS - public safety interference in the 800 MHz band in municipalities across the country. In a typical incident, a police officer or firefighter finds that his or her mobile radio does not work well – or at all – in areas near CMRS base stations where communications had previously been satisfactory.[13] Interference to public safety radios raises serious public interest concerns, as public safety officials use these radios to provide communications supporting life safety services, such as police, fire and rescue services, as well as other governmental functions including road maintenance, trash collection, security services, traffic management, snow removal and similar public works services.

CMRS – public safety interference has been reported in about 25 cities throughout the nation including Seattle, Washington; Miami, Florida; Hialeah, Florida; Orange County, California; Phoenix, Arizona; Baltimore, Maryland; and Salt Lake City, Utah. These reports are becoming more frequent with the increased buildout of commercial wireless networks that use advanced cellular-type, multiple base station architecture to place a strong localized signal "on

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[13] The area of interference can be as small as a few feet to as much as one-quarter of a mile from the commercial operator's base station site.

the ground" relative to the signal strength found in public safety networks using one or a few distant base stations to cover a large area. These factors create conditions in which interference is likely, despite the fact that all affected parties are operating their communications systems in full compliance with the Commission's rules and the parameters of their FCC licenses. In some cases, a commercial SMR operator such as Nextel is the sole source or a contributing source of interference to public safety systems. A cellular operator can be the sole source of CMRS – public safety interference, and cellular operators can combine with each other or with commercial SMR operators to cause interference -- particularly when using co-located base station sites.

For example, officers of the City of Denver Police Department experienced disruptive interference on their 800 MHz mobile communications system in the immediate vicinity of approximately 20 Nextel base stations – largely due to intermodulation products formed in the officers' radios – even though Nextel was operating in full compliance with the Commission's rules. Interference has disrupted police communications in the vicinity of co-located Nextel and AT&T Wireless (the cellular A-band licensee) base stations in the nearby cities of Cherry Hills and Westminster, Colorado. The Maui, Hawaii Police Department reported that its officers' handsets and mobile units were experiencing interference at a heavily-trafficked shopping center near the co-located base stations of the cellular A band licensee, AT&T Wireless, and Nextel Partners.[14] The interference resulted primarily from AT&T Wireless's operations on frequencies adjacent to the channels licensed to the police communications system, with a secondary contribution from Nextel Partners' co-located transmissions.

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[14] Nextel Partners, Inc. ("Nextel Partners") is a partially-owned affiliate of Nextel, which provides 800 MHz iDEN digital services in 100 secondary and tertiary markets throughout the

In Oregon, the City of Portland and the Washington County Consolidated Communications Agency ("WCCCA") identified interference in the immediate vicinity of a number of Nextel base stations. Working together, WCCCA and Nextel engineers have resolved most of these situations; however, as WCCCA expands its communications network geographically into adjacent counties and into the NPSPAC channels – to meet increasing demand and coverage requirements – adjacent A-band cellular operations are causing interference. The City of Portland is also experiencing interference in the vicinity of CMRS base stations, including the cellular A band carrier and Nextel – both alone and in combination. Similarly, police, fire and emergency medical services personnel in Anne Arundel County, Maryland have reported interference to mobile communications in the vicinity of co-located cellular (here Cingular and Verizon) and/or Nextel base stations. As the County considers technical specifications for a replacement radio system, it is asking all in-band carriers to participate in a channel coordination effort for controlling interference to its public safety radio system.[15] The County is also asking Nextel to work with it on a possible channel swap to alleviate the continuing interference. Such a swap could be a localized version of the realignment proposal set forth herein.

C. Efforts to Address CMRS - Public Safety Interference in the 800 MHz Band

The Commission began receiving inquiries and complaints about CMRS – public safety interference in 1999. In April 2000, it brought together affected parties in response to increased reports of interference to 800 MHz public safety radio networks apparently resulting from the

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United States. Nextel Partners utilizes the same mix of 800 MHz spectrum and faces the same potential interference issues that Nextel does in the 800 MHz band.

[15] See Letter, dated October 30, 2001, from Spurgeon R. Eismeier, Sr., Central Services Officer, Anne Arundel County, to Lawrence R. Krevor, Nextel Communications, Inc.

operations of nearby commercial systems, even though all providers were operating within the parameters of their FCC licenses. A number of participants formed a working group to identify the causes of the interference, identify mitigation alternatives, and develop joint planning and technical solutions for preventing interference.[16]

On January 4, 2001, the group presented to the Wireless Telecommunications Bureau (the "Wireless Bureau") a "Best Practices Guide" that provides a broad overview of practices that can be used to identify and alleviate interference between public safety systems and commercial systems.[17] The Best Practices Guide offers strategies that can mitigate interference through frequency planning, strategic location of public safety and commercial base stations, system design improvements for commercial and/or public safety networks, equipment upgrades, frequency swaps, and, if necessary, FCC rule changes or waivers. Subsequently, the Association of Public Safety Communications Officials, International ("APCO") established an initiative called Project 39 to further the goals of the Best Practices Guide. APCO Project 39 membership includes persons representing the public safety community, manufacturers and commercial operators as well as the National League of Cities, the National Association of Counties, and the associations representing police and fire chiefs. The Wireless Telecommunications Bureau named the Deputy Chief for Public Safety of the Bureau's Public Safety and Private Wireless Division as the FCC's liaison to Project 39.[18]

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[16] The group included Motorola, Inc., the Association of Public Safety Communications Officials International ("APCO"), PSWN, CTIA, and Nextel.

[17] *See FCC Press Release*, Wireless Telecommunications Bureau Announces Best Practices Guide for Avoiding Interference Between Public Safety and Commercial Wireless 800 MHz Communications Systems (issued February 9, 2001).

[18] *See* Letter from D'wana R. Terry, Chief, Public Safety and Private Wireless Division, to Mr. Joe Kurran, Washington County Consolidated Communications Agency, dated September 13, 2001.

Notwithstanding these efforts, reports of CMRS – public safety interference continue. Disruptive interference has been reported recently in the vicinity of four CMRS sites in the Las Vegas area, at additional sites in south Florida, and at sites in the Greater Los Angeles area. These reports illustrate the continuing nature of this problem and indicate that additional instances of CMRS – public safety interference will occur unless the FCC takes effective remedial action to address and correct the underlying causes of this problem.

V. THE CAUSES OF CMRS – PUBLIC SAFETY INTERFERENCE AND THE PUBLIC SAFETY COMMUNITY'S NEED FOR ADDITIONAL SPECTRUM

One of Congress's overriding objectives in establishing the FCC was " to make available, so far as possible, to all the people of the United States, . . . a rapid, efficient, nationwide and world-wide wire and radio communication services . . . for the purpose of promoting safety of life and property through the use of wire and radio communication."[19] Consistent with this vital objective, the FCC is responsible for devising an effective, long-term solution to the problem of CMRS – public safety interference in the 800 MHz band, and for acting on requests to allocate additional spectrum for public safety communications. Specifically, the Commission should: (1) recognize that the current spectrum allocation and spectrum licensing structure of the 800 MHz band is the fundamental cause of CMRS – public safety interference in this band; (2) correct this problem by, among other things, realigning the 36 MHz of land mobile radio spectrum at 806/824 – 851/869 MHz so that public safety, private radio, and CMRS are no longer commingled; and (3) allocate an additional 10 MHz of near-term available spectrum at 800 MHz for public safety communications.

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[19] 47 U.S.C. § 151.