band, and its proposed shift of digital SMR operators out of the interleaved spectrum at 806-816/851-861 MHz, would by themselves significantly reduce the likelihood of IM interference to public safety transmissions. This improvement would occur with respect to interference from (i) Nextel operations, (ii) cellular A-band and B-band carriers above 824/869 MHz, and (iii) the collocated operations of Nextel and cellular A-band/B-band carriers.

First, with respect to Nextel's own operations, more than half of Nextel's transmitters currently operate in the 861-866 MHz range, and standard IM calculations indicate that 3rd-order IM products created in public safety receivers from these facilities fall predominantly into spectrum at 856-871 MHz. By relocating the NPSPAC public safety operations outside this range, at 851-854 MHz, the Consensus Plan would significantly lower the probability of Nextel-based interference to public safety radio systems using the new NPSPAC channels. For locations where public safety users are currently experiencing Nextel-only IM-related interference on the NPSPAC channels, relocating the NPSPAC channels as described herein will reduce the probability of Nextel-only IM interference on the relocated channels by 98 to 100 percent.[44]

Moreover, moving Nextel's operations into the former NPSPAC spectrum at 821-824/866-869 MHz would enable Nextel to manage its frequency usage more effectively to minimize IM products falling on the interleaved public safety channels in the 854–859 MHz range. Importantly, post-realignment, Nextel would be operating over only an 8 MHz range on the base-to-mobile frequency, instead of an 15 MHz range, thereby significantly reducing the bandwidth of possible IM "hits" on the relocated public safety

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44 *See* Cascioli Technical Statement at page 3.

channels.[45] Much of the remaining IM products would fall instead on channels within the guard band, 859–861 MHz, at the top end of the new non-cellularized spectrum block. Thus, by moving Nextel out of the interleaved channels to the contiguous cellularized block and shifting the NPSPAC channels to 851-854 MHz from their current location between Nextel and the cellular A-band, the Consensus Plan would effectively limit the range of possible intermodulation interference products affecting non-cellular band licensees.

The Consensus Plan would have a similar effect on IM interference from cellular A-band operators transmitting at 824-835/869-880 MHz and B-band carriers operating above 835/880 MHz.[46] Because the harmful IM products generated solely by cellular A-band and B-band operators would in most cases be sufficiently attenuated (given the existing front-end filter roll-off characteristics of current public safety handsets), public safety systems relocated from 821-824/866-869 MHz to 806-809/851-854 MHz would not receive interference *at all* from cellular-only operations – *a 100% improvement for public safety NPSPAC channel users experiencing interference today.*[47] The IM products

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[45] *See* Cascioli Technical Statement at page 3. After realignment, Nextel would not, by itself, be able to produce an IM hit below 853 MHz, thereby excluding two-thirds of the relocated NPSPAC channels from Nextel-only IM. Therefore, operating in this simplified environment, Nextel can more effectively coordinate its frequency reuse plans within a market to avoid IM hits of public safety channels in high IM probability venues or circumstances.

[46] *See* Cascioli Technical Statement at page 3.

[47] In order for a CMRS intermodulation product to interfere with a public safety transmission, the IM product must be nearly as strong as the desired public safety signal, a condition that becomes less likely as the contributors are attenuated by front-end filter rolloff.

generated by each of the cellular carriers would fall almost exclusively in the digital, cellularized SMR band and the guard band at the top of the non-cellular spectrum.

The Consensus Plan would also dramatically decrease the probability of IM interference from combined Nextel and collocated cellular A-band/B-band transmissions. For locations where public safety users are currently experiencing combined Nextel – cellular A band IM interference on NPSPAC channels, relocating these channels as provided in the Consensus Plan will reduce the probability of post-realignment IM interference by *at least 78% to as much as 94%, depending on the specific channels being used.*[48] While the Consensus Plan does not completely eliminate the possibility of CMRS – public safety IM interference, even under the worst-case assumptions, it reduces the likelihood of IM interference to a manageable level.

Thus, counter to some commenters' claims, the Consensus Plan band realignment would substantially reduce IM-related interference. Placing cellularized operations in an 8 x 8 MHz contiguous block would reduce the maximum frequency span of these operations by almost half, thereby halving the span of IM products across the 800 MHz band. As the primary cellular-type operator in the 851-869 MHz block, Nextel would be better positioned to minimize IM "hits" outside the guard band block. The realignment would also set the stage for developing tighter front-end filters for public safety receivers.[49]

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[48] *See* Cascioli Technical Statement at page 4.

[49] As stated in the Consensus Plan at 22, the band realignment "will also provide equipment manufacturers with the opportunity to design front end filters that cover a smaller range of spectrum for public safety licensees."

In the White Paper and in its Comments, Nextel proposed additional complementary measures to even more completely insulate public safety operations from CMRS – public safety interference.[50] Nextel continues to support new public safety receiver standards for intermodulation rejection performance. In particular, the Commission should require narrower bandpass filters to take advantage of the Consensus Plan's aggregation of public safety spectrum within the 806-816/851-861 MHz non-cellular block, as opposed to its current fragmentation across the Land Mobile Radio Band; with this realignment, public safety receivers would no longer have to span the entire 18 MHz Land Mobile Radio Band to cover all public safety channels at 800 MHz. Similarly, new requirements for public safety signal strength would make public safety systems more interference-resistant. Finally, more stringent out-of-band emissions ("OOBE") standards for CMRS providers would effectively combat sideband noise, a secondary source of interference. The restructuring proposed in the Consensus Plan and appropriate complementary measures would provide stable, long-term protection against the various causes of CMRS – public safety interference, regardless of those systems' traffic growth.[51]

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[50] *See, e.g.,* Comments of IAFC at 6 (opposing public safety receiver standards); Comments of PSWN at 17-18 (opposing requirement for increased public safety signal strength); Comments of Verizon Wireless at 11-12 (opposing more stringent out-of-band emissions limits for CMRS providers). While Nextel is sensitive to the concerns of public safety entities that question the need for receiver standards and signal strength requirements, it continues to believe that such measures are appropriate mechanisms for reducing CMRS – public safety interference.

[51] AT&T Wireless is wrong when it claims that this 800 MHz realignment could not withstand increases in CMRS and public safety traffic and that a second, corrective restructuring would be inevitable. AT&T Wireless Comments at 18-19. In fact, the erroneousness of this claim is demonstrated in the WFI study, in which AT&T Wireless itself participated. *See An Investigation of the 800 MHz Band Interference between the*

The Commission should reject arguments, as it recently did in the 700 MHz proceeding,[52] from several commenters who suggest that more restrictive power limits for 800 MHz CMRS providers are necessary to resolve CMRS – public safety interference. Such power limits would be counterproductive, a fact recognized by PSWN.[53] As PSWN notes, compliance with on-street power reductions would require Nextel and other CMRS carriers to construct and operate thousands of additional cell sites in order to maintain existing coverage. This expanded architecture would not only raise the cost of providing commercial wireless services, it would actually *increase* interference to public safety operations.[54]

B. Affected Licensees Would Receive Suitable Spectrum on a "kHz-for-kHz" Basis – Nextel Would Not Receive a Spectrum Windfall

A variety of commenters allege that Nextel's receipt of replacement spectrum for the 700 MHz, 800 MHz and 900 MHz channels it would contribute to realignment would

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Public Safety and CMRS Radio Systems, Wireless Facilities, Inc., at 9 (Feb. 2002) (attached as Appendix B to Comments of Nextel) ("*WFI Report*").

52 *Petitions for Reconsideration of the Second Memorandum Opinion and Order, Service Rules for the 746-764 and 776-794 MHz Bands and Revisions to Part 27 of the Commission's Rules*, Third Memorandum Opinion and Order, WT Docket No. 99-68, FCC 02-204, ___ FCC Rcd ___ (Released July 12, 2002).

53 *See* Comments of PSWN at 17-18.

54 *Id.* CMRS – public safety interference becomes more likely as a public safety receiver moves closer to a CMRS base station. While CMRS power limits would decrease the size of the interference zone around each base station, such reductions would be more than offset by the increase in the number of base station interference zones. Certainly, growth in the number of cell sites would increase the coordination burden on both CMRS providers and public safety operators.

give Nextel a "spectrum windfall."[55] These arguments are flawed in a number of respects, and should not prevent the Commission from meeting the critical needs of the public safety community.

There is no reliable means of assigning a comparative, per-MHz value to different spectrum bands. With its auction authority inapplicable here, the Commission lacks any legitimate methodology for assessing the variety of economic variables and other factors that determine the market value of a given spectrum license.[56] Moreover, the Commission frequently adopts rules, grants applications, and issues other orders that can enhance the value of a licensee's spectrum holdings.[57]

In fact, the cellular providers that uniformly protest the supposed Nextel "windfall" have themselves benefited financially from various Commission decisions since cellular service was initiated. In a number of instances, the Commission has amended its rules to give cellular licensees greater flexibility in the type of technologies they may use *increasing their operational capabilities* and in the types of services they can provide to customers. These rule changes have created new business opportunities

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55 *See, e.g.*, Comments of AT&T Wireless at 20-21; Comments of Verizon Wireless at 13-15; Comments of Lockheed Martin at 6; Comments of Boeing at 28; Comments of Motient at 14; Reply Comments of SBT at 50-51.

56 *See FCC Report to Congress on Spectrum Auctions*, WT Docket No. 97-150, FCC 97-353, at 32-33 (Oct. 9, 1997) (describing the difficulty in determining the value of spectrum outside of the auction context and stating that the Commission has traditionally not made its own estimate of the value of the spectrum).

57 Indeed, the Commission has historically sought to promote the more efficient, and therefore more valuable, use of the spectrum. *See, e.g., Amendment of Parts 21 and 74 to Enable Multipoint Distribution Service and Instructional Television Fixed Service Licensees to Engage in Fixed Two-Way Transmissions*, Report and Order, 13 FCC Rcd 19112 (1998) ("*MDS/ITFS R&O*"), *recon.*, 14 FCC Rcd 12764 (1999), *further recon.*, 15 FCC Rcd 14566 (2000).

and efficiencies that have significantly benefited these operators. For instance, in 1988, the Commission modified its technical rules to allow cellular licensees to use "alternative technological platforms for cellular service, provided that they continued to provide compatibility with AMPS . . . to their analog customer base."[58] This decision enabled cellular providers to offer digital services, thereby making expanded services such as short messaging and paging over cellular systems technologically possible and economically viable. In that same order, the Commission also permitted cellular carriers to provide auxiliary common carrier services over their spectrum, including paging services.[59] In 1996, the Commission amended its rules to allow cellular and other CMRS providers to provide fixed wireless services on a co-primary basis with commercial mobile services.[60] No doubt these orders significantly raised the value of cellular spectrum, a likelihood that did not deter the Commission from making decisions that promoted the public interest. Nor did Cingular, Verizon Wireless, or AT&T Wireless protest against receiving these "windfalls." The Commission's approach in the instant proceeding should be no different.

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58 *See Year 2000 Biennial Review – Amendment of Part 22 of the Commission's Rules to Modify or Eliminate Outdated Rules Affecting the Cellular Radiotelephone Service and Other Commercial Mobile Radio Services,* Notice of Proposed Rulemaking, 16 FCC Rcd 11169, ¶ 19 and n.25, *citing Amendment of Parts 2 and 22 of the Commission's Rules to Permit Liberalization of Technology and Auxiliary Service Offerings in the Domestic Public Cellular Radio Telecommunications Service*, Report and Order, 3 FCC Rcd 7033 (1988) ("*1988 Report and Order*"). Significantly, the Commission is this week considering whether to grant the cellular carriers additional technical flexibility by eliminating the analog service requirement.

59 *1988 Report and Order,* ¶ 67.

60 *Amendment of the Commission's Rules to Permit Flexible Service Offerings in the Commercial Mobile Radio Services*, First Report and Order and Further Notice of Proposed Rule Making, 11 FCC Rcd 8965 (1996).

Under the Consensus Plan, Nextel would give up just over 10 MHz of spectrum to help achieve the important public interest goals in this proceeding, and in return would receive a replacement 10 MHz at 1.9 GHz.[61] As discussed further below, Nextel would contribute $500 million toward the cost of relocating public safety systems, and it would also cover the relocation costs associated with clearing of the 1910-1915/1990-1995 MHz bands. Nextel's ***own*** relocation costs would be the highest of any other single licensee. Nextel must vacate a running average of 8.5 MHz in the non-cellularized 800 MHz block. Also, throughout the realignment process, Nextel would have to undertake a number of interim moves to have sufficient capacity to serve its more than 10 million customers while, at the same time, creating sufficient "greenspace" for realignment to proceed. Nextel would have to reconfigure its wireless communications network – entailing substantial equipment, engineering, and administrative changes – at its own cost.

For all of these reasons, the Commission should not be misled by realignment opponents and Nextel competitors. For the Consensus Plan realignment, Nextel would be contributing spectrum for which it paid over $2 billion in Commission auctions and secondary market transactions. Nextel would bear the costs of its own relocation, work with the LMCC and the Public Safety Regional Planning Committees to coordinate the relocation and retuning of other 800 MHz licensees, and contribute $500 million to relocate public safety licensees. Moreover, the parties directly affected by CMRS –

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[61] Under the Consensus Plan, Nextel would contribute significantly more than 16 MHz in some (mostly urban) markets and somewhat less in others (mostly rural). Across all markets, it would contribute a running average of 16 MHz. As explained in its comments, Nextel has a mix of site-specific and geographic area licenses. Nextel has aggregated its spectrum through acquisitions and assignments of site-by-site licenses in the 800 MHz and 900 MHz bands and supplemented those holdings with wide-area, geographic overlay licenses and 700 MHz guard band licenses. Nextel Comments at 52.

public safety interference and this spectrum realignment – including private wireless licensees, high-site SMRs, and public safety licensees – agree that the restructuring proposed in the Consensus Plan is the best way to achieve the Commission's objectives in this proceeding. The Consensus Plan simply recognizes that Nextel must be made whole for its contributions to the mitigation of CMRS – public safety interference and the improvement of 800 MHz public safety communications services.

C. The Consensus Plan Can be Implemented Expeditiously

The public interest requires that 800 MHz realignment be implemented as rapidly as possible to avoid disrupting public safety communications and creating risks for emergency services personnel and the citizens they serve. If the Commission takes the appropriate steps, the Consensus Plan and associated licensee relocations can be implemented completely within 36 to 48 months of the effective date of a Report and Order in this proceeding. Specifically, the Commission should direct the LMCC, the regional planning committees, and Nextel to work together to complete, by a date certain, a comprehensive band plan for the new 800 MHz public safety/B/ILT/high-site SMR pool (channels 121–400) as well as the reallocated 700 MHz and 900 MHz spectrum bands.

D. The Consensus Plan Would Minimize Burdens on Existing Licensees

1. Public safety operators should be fully compensated for their relocation costs

Most public safety commenters express concern that a Commission decision to realign the 800 MHz band would fail to include sufficient compensation for public safety

operators.[62] In particular, a number of public safety operators question the sufficiency of Nextel's offer to provide $500 million to fund relocation.[63]

Nextel's contribution would cover a substantial portion of public safety operators' relocation costs under the Consensus Plan.[64] Nextel's commitment is a critical first step that should facilitate additional contributions from other private and possibly public sector entities. At the same time, Nextel acknowledges that public safety relocation costs could exceed $500 million, and it has therefore proposed that cellular A- and B-block systems and other commercial SMR providers be accountable for the remaining portion of this relocation funding. While the cellular commenters uniformly deny that they produce more than trivial CMRS – public safety interference, their claims are contradicted by APCO's Project 39 report, which attributes public safety interference to cellular operations.[65] The Consensus Plan also makes clear that "interference is not being experienced solely from Nextel systems, but also from other cellular carriers operating on

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62 *See, e.g.*, Comments of County of Maui at 6 (estimating approximately $5 billion for a nationwide solution); Comments of IAFC/IMSA at 5 (citing Motorola estimate of $1.05 billion for a nationwide solution).

63 *See, e.g.*, Comments of City of Fort Lauderdale at 6; Comments of APCO *et al.* at 22; Comments of City of Baltimore at 4; Comments of State of Hawaii, Department of Accounting and General Services at 1; Comments of County of Maui at 6.

64 While the parties have no formal plan or commitment at this time, Nextel and the private wireless community are currently discussing funding issues with respect to private wireless relocation.

65 *See* APCO Project 39 Status Report (Mar. 19, 2002) (attached to Comments of APCO Project 39 Technical Committee) at 6 ("it is our firm belief that interference exists anywhere low-HAAT/high-power (or extreme downtilt) sites in the 800 MHz band are operating within the operational footprint of 800 MHz radio systems designed under noise-limited principles. We also believe this to not be a phenomenon isolated to Nextel sites in the footprint of public safety systems. Multiple public safety systems operating in the same geographic area could present the same challenge if their design philosophies differed, as could other commercial carriers.") ("*APCO Project 39 Report*").

adjacent channels to public safety."[66] Cellular providers would benefit significantly from the Consensus Plan by being relieved of the burdens of *ad hoc* interference resolution and by having greater flexibility in operating their networks. Accordingly, Nextel believes that other CMRS providers collectively should provide any funding necessary for public safety relocation beyond Nextel's $500 million contribution.

2. Nextel's $500 million contribution toward public safety relocation costs would be placed in an independently administered fund

To provide certainty for both the public safety community and Nextel regarding the collection and disbursement of the up to $500 million Nextel would commit toward public safety relocation, Nextel would create an independently administered fund. The fund would be established when the Commission adopts the proposed Consensus Plan in a Report and Order in this proceeding. Nextel would then contribute $50 million as an initial deposit to the fund and, at that time, establish a separate escrow account of $450 million to be paid into the fund upon satisfaction of the conditions described below. No money would be disbursed from the fund, and Nextel would make no further contributions to the fund, until the following conditions have been satisfied: (1) The Report and Order adopting the Consensus Plan becomes a final order, with all appeals and challenges to the Report and Order resolved; (2) an independent fund administrator ("Administrator"), acceptable to the Commission and reasonably acceptable to Nextel and the public safety organizations has been appointed; (3) guidelines are established identifying eligible retuning expenditures for relocating incumbent public safety

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[66] Consensus Plan at 21. In Anne Arundel County, an independent consultant estimates that the cellular A-band carrier is involved in approximately 35% of the CMRS sites near which CMRS – public safety interference has been identified.

communications licensees; and (4) procedures for making and verifying claims for public safety relocation cost reimbursement have been established by the Administrator and approved by the Commission (if it chooses to participate), Nextel (Nextel's approval not to be unreasonably withheld or delayed) and the public safety organizations.[67]

Upon satisfaction of these conditions, the Administrator would be authorized to begin paying the retuning costs of incumbent 800 MHz band public safety licensees that must be relocated pursuant to the Consensus Plan. Nextel would also contribute an additional $50 million to the fund and agree that the remaining $400 million would be released to the fund according to the following procedures. The Administrator would report to the Commission and Nextel whenever disbursements from the fund reduce the amount on deposit to $50 million, and Nextel would then contribute an additional $50 million to the fund. Nextel would not be required to make any further payments to the fund after the fourth anniversary of its second $50 million payment to the fund. On the second anniversary of the last deposit by Nextel, any money remaining in the fund would be refunded to Nextel and/or other contributors.

3. Relocation will not disrupt public safety communications services

Some commenters express concern that public safety communications will be disrupted during the transition to a new 800 MHz band plan. Nextel and the coalition proposing the Consensus Plan understand the critical nature of public safety communications. No area of the country can afford to be without reliable, high-quality emergency communications even for a short period. Certainly, public safety operators

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[67] If these conditions are not satisfied within two years after the release of a Report and Order adopting the proposed Consensus Plan, Nextel reserves the right to have all of

should not be required to relocate to new spectrum until their systems are fully ready; completion of all technical and operational preparations and thorough system testing must precede actual operations on replacement frequencies.

Nextel gained substantial experience in incumbent relocation following the Commission's 1995 order establishing geographic licensing in the upper 200 SMR channels.[68] Numerous incumbent licensees in that spectrum predicted that their relocation would lead to disaster,[69] but Nextel, the predominant geographic area licensee in that band, successfully managed the retuning of approximately 1,000 such systems, including some public safety facilities and utility communications systems.[70] Nextel is confident that the Consensus Plan can be implemented just as successfully, in a manner that will enable public safety systems around the country to remain fully operable during and after this transition. Of course, only rarely are such transitions entirely free of any complication. Whatever minor, short-lived problems arise during the transition, however, will be far outweighed by the long-term benefits of reduced interference and access to additional, contiguous spectrum.

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its contributions to the fund refunded.

68 *See 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 Rule Making, 11 FCC Rcd 1463, ¶ 79 (1995) ("*800 MHz Report and Order*"), *aff'd by Memorandum Opinion and Order on Reconsideration*, 14 FCC Rcd 17556, ¶ 38 (1999).

69 *See, e.g., 800 MHz Report and Order*, ¶ 68.

70 For example, Nextel assisted in or retuned the systems operated by the City of Chicago's Police Department, the City of Louisville, the State of Oklahoma, the County of San Bernardino, and Duke Power from the upper 200 SMR channels.

A number of public safety operators also worry that, if the Commission realigns the 800 MHz band, international spectrum agreements will make it impossible to accommodate fully some border area systems.[71] As indicated above, the Consensus Plan will maintain the existing proportionate U.S. allocation in the U.S./Canada and U.S./Mexico border areas.

4. The Consensus Plan enables Private Radio incumbents to stay at 800 MHz with minimal relocation and costs

The Consensus Plan satisfies the primary objectives of private radio system operators: remaining in the 800 MHz band and spectrally separating incompatible technologies. B/ILT and high-site SMR operators at 809-814/854-859 MHz will be able to continue operations in their 800 MHz licensed spectrum, as should many private operators currently located in what will become the 814-816/859-861 MHz guard band for "campus-type" systems or other interference-resistant B/ILT and non-cellularized SMR systems. Meanwhile, private wireless systems in the 806-809/851-854 MHz band will be able to relocate to (i) the 814-816/859-861 MHz Guard Band, (ii) greenspace in the 809-814/854-859 MHz band, or (iii) vacated Nextel spectrum in the 900 MHz band, where *voluntarily* relocating licensees will receive an out-of-band relocation premium of a 50 kHz channel in exchange for every 800 MHz 25 kHz channel.[72]

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[71] *See, e.g.*, Comments of New York State Office for Technology at 12-14, 27-33; Comments of San Diego County – Imperial County Regional Communications System at 3; Comments of King County, WA at 3.

[72] Nextel's licensed spectrum in the 900 MHz band is more substantial than some other commenters have claimed. As indicated in its comments, Nextel's 900 MHz holdings have recently been augmented through a subsidiary's acquisition of 83 licenses for 900 MHz MTAs from Neoworld License Holdings. *Wireless Telecommunications Bureau Grants Consent for the Transfer of Control of 900 MHz SMR Licenses From Neoworld License Holdings, Inc. to FCI 900, Inc.*, Public Notice, 17 FCC Rcd 7051 (2002). (That transaction has not yet been consummated.) With the Neoworld

5. Harm to MSS or UPCS interests from the Consensus Plan would be insubstantial and would be far outweighed by the benefits of the Consensus Plan

A variety of Mobile Satellite Service ("MSS") and Unlicensed Personal Communications Service ("UPCS") commenters oppose the proposed redesignation and licensing to Nextel of spectrum in either the 2 GHz MSS band or the 1910-1930 MHz UPCS band. These parties argue that their respective services are generating or will generate great benefits, and that these services represent the best use of their particular spectrum bands.[73] According to these commenters, the reassignment of their respective bands to Nextel's cellularized operations would cause substantial harm to these services.[74]

The Commission should reject these arguments. First, the Consensus Plan's redesignation to Nextel of 5 MHz of MSS uplink spectrum at 1990-1995 MHz would cause no harm to the development of 2 GHz MSS systems.[75] This redesignation would

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acquisition, Nextel holds a running average of 3.8 MHz at 900 MHz in the top 320 markets.

[73] *See, e.g.*, Comments of Avaya at 6-7; Comments of UTAM at 3; Comments of Boeing at 31; Comments of SIA at 8.

[74] *See, e.g.*, Comments of Avaya at 8-9; Comments of UTAM at 8-11; Comments of Boeing at 32; Comments of SIA at 6-8.

[75] SIA, Boeing, and CMRS commenters note that the potential use of 2 GHz MSS frequencies for terrestrial service is already being considered in two pending proceedings at the Commission. Comments of Boeing at 27-28; Comments of SIA at 4-5; Comments of AT&T Wireless at 21; Comments of CTIA at 5; Comments of Cingular/ALLTEL at 12. Some argue that Nextel should have raised its proposed use of 2.1 GHz spectrum in those dockets, and that the proposed redesignation should not be considered in the instant proceeding. *See* Comments of Boeing at 28; Comments of AT&T Wireless at 21. The redesignation of the 1990-1995 MHz to Nextel is inextricably linked to the relocation of public safety and other 800 MHz band incumbents to new spectrum, however, and the Commission should evaluate this proposal in the context of 800 MHz realignment.

affect only expansion frequencies in this band and no existing licensee would lose any spectrum.[76] This reassignment would have no impact on MSS providers' ability to construct their systems, achieve sustainable businesses, and provide their services.[77] Simply put, MSS interests have provided no legitimate reason why the 1990-1995 MHz band should not be used to make Nextel whole for its contributions to the mitigation of CMRS – public safety interference and the improvement of 800 MHz public safety communications.

Nor would the Consensus Plan and its proposed reassignment of the 1910-1915 MHz band to Nextel cause any harm to UPCS development. These frequencies are in the portion of the UPCS band (1910-1920 MHz) designated for asynchronous operations, and, eight years after the UPCS allocation was established, the Commission has yet to certify a single piece of equipment for use in this band. There is no present demand for asynchronous UPCS devices, and any future demand for unlicensed asynchronous

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[76] In its comments, Iridium LLC claims that Nextel and New ICO are affiliates and are working together to develop a dominant satellite/terrestrial network in the 2 GHz band that would deter investment in other 2 GHz MSS systems. Iridium Comments at 2-3. There is no validity to this charge. Nextel and New ICO are distinct legal entities with fiduciary obligations to their shareholders and their own, separate business goals. There is no coordinated effort between them with respect to operations in the 2 GHz band.

[77] The Society of Broadcast Engineers ("SBE") states that if Nextel is reallocated spectrum in the 1990-2025 MHz band, the Commission must ensure that Nextel reinsures BAS licensees for the reasonable costs of their own relocation. Comments of SBE at 3. As indicated in its comments, Nextel is willing to work with broadcasters to develop a BAS relocation plan for its proportionate amount of MSS spectrum, now proposed to be only 5 MHz at 1990-1995 MHz. *See* Nextel Comments at 50-51. SBE also expresses concern that Nextel's presence in the 1990-2025 MHz band will result in interference to and from BAS facilities. SBE Comments at 2. Nextel disagrees; its use of the 1990-1995 MHz band for CMRS would be similar to existing operations below 1990 MHz and would therefore raise no interference issues for BAS facilities.

devices could be met by spectrum in other unlicensed service bands, including the 2.4 GHz and 5.8 GHz bands.

With the reassignment of the 1910-1915 MHz band to Nextel, the isochronous UPCS allocation would obviously remain intact at 1920-1930 MHz. Were the Commission to conclude that an expansion of the isochronous spectrum is in the public interest, as a number of UPCS interests have urged,[78] this redesignation would also leave the Commission free to reallocate the 1915-1920 MHz band from asynchronous UPCS to isochronous UPCS.[79]

Some parties present unsupported technical arguments against the reallocation of UPCS spectrum to Nextel, claiming that only low-power UPCS devices can operate in the 1910-1930 MHz band without causing interference to adjacent operators.[80] These assertions are meritless; Nextel's mobile-to-base station operations at 1910-1915 MHz would cause no harmful interference to surrounding broadband PCS systems. Specifically, Nextel's handset transmissions would have no effect on much stronger base station-to-mobile signals at least 15 MHz away in the broadband PCS A Block at 1930-1945 MHz, and would cause no harmful interference to mobile-to-base station operations in the adjacent broadband PCS C Block at 1895-1910 MHz.[81] In addition, Nextel's

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78 *See* Comments of NEC America at 5-6; Comments of UTAM at 13-16.

79 In the Commission's 3G proceeding, there has been considerable debate on the need for additional spectrum for isochronous UPCS operations. *See, e.g.,* Reply Comments of ArrayComm, ET Docket No. 00-258, at 5-6 (Nov. 8, 2001).

80 Comments of Avaya at 9; Comments of NEC America at 4; Comments of UTAM at 10-11.

81 Similarly, Nextel's base station-to-mobile transmissions at 1990-1995 MHz would cause no new interference to MSS (or MSS/ATC) systems operating in the 1995-2025 MHz band.

operations at 1910-1915 MHz would not cause harmful interference to UPCS devices transmitting at 1915-1930 MHz, even if the 1915-1920 MHz band is reallocated to isochronous UPCS. (The Commission's rules, of course, do not protect unlicensed devices from interference from licensed service providers.) Indeed, UPCS interests currently favoring expansion of the isochronous UPCS band to 1910-1930 MHz band clearly believe that isochronous UPCS devices can operate adjacent to broadband PCS systems at 1910 MHz, and Nextel's operations would be largely indistinguishable from those PCS systems from an interference perspective.

Finally, in its comments, UTAM, the entity that has coordinated the clearing of incumbent microwave systems from the UPCS band, states that it has spent more than $60 million towards this band-clearing effort over the last eight years.[82] If reassigned to the 1910-1915 MHz band, Nextel commits to reimburse UTAM for all reasonable expenditures related to relocating incumbents from this 5 MHz band segment.

V. NO INDIVIDUAL LICENSEE SHOULD BEAR THE BURDEN OF CORRECTING CMRS – PUBLIC SAFETY INTERFERENCE

A. CMRS – Public Safety Interference is a Complex Problem Resulting from Numerous Actions and Developments Over Several Decades

The Consensus Plan recognizes that resolving CMRS – public safety interference in the 800 MHz band is not the responsibility of any one licensee, but instead requires a comprehensive band realignment plan and the cooperative efforts of all affected licensees. Several commenters nonetheless argue that the commercial operators causing interference to public safety systems should be *solely* responsible for remedying that

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82 UTAM Comments at 3-4.

interference, absorbing costs incurred by all parties involved in such remediation.[83] Some commenters have even argued that Nextel should either foot the entire bill for public safety relocation or should be relocated to the 700 MHz band. For example, the Fairfax County, VA Department of Information Technology states that "Nextel must bear the burden and all costs associated with correcting the interference problem resulting from their operations in the 800 MHz band."[84]

This position is unwarranted. Commenters who attempt to blame Nextel misunderstand the facts of CMRS – public safety interference and mischaracterize the rights and responsibilities of Commission licensees and the Commission's public interest regulatory policies. As discussed below, CMRS – public safety interference is a complex problem resulting from numerous actions and developments over the last several decades, including the Commission's 800 MHz allocation decisions, public safety radio operators' choice of system architecture, the adoption of new, Commission-approved technologies by SMR and cellular providers, and unanticipated growth in CMRS and public safety

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[83] *See, e.g.,* Comments of Public Safety Improvement Coalition, Exhibit A, Comment of City of San Diego (stating that "all costs associated with any 800 MHz reallocation proposal should be the sole responsibility of the carriers and other business enterprises who are causing interference to public safety"); Comments of UTC at 16 (stating that "the FCC should take the opportunity in this proceeding to clarify further that parties causing interference are not only required to cooperate with affected licensees, but are solely and directly responsible for the cost of correcting the interference"); Reply Comments of SBT at ii (stating that "Nextel should bear the brunt of the burden for resolving the interference problem, including all costs related thereto"). While SBT – an entity that purports to represent unidentified "companies and persons serving the telecommunications industry" – states its intent to "avoid vitriol," the rambling screed it has submitted in the form of reply comments fails completely in that effort and directs numerous unwarranted and overheated allegations at Nextel. Such tactics are unproductive and unnecessary, especially in comparison to the constructive, good faith efforts made by all of the parties that have joined in the Consensus Plan, including Nextel.

[84] Comments of Fairfax County at ¶ 27.

traffic. CMRS operators whose transmissions interfere with public safety communications are typically operating in full compliance with their licenses. In particular, Nextel is operating in full compliance with the terms and conditions of its licensees and the regulatory structure for SMR licensees, as reviewed and confirmed by the Commission on numerous occasions. Given this reality, it would be absurd for the Commission to place the burden of remediation on Nextel or any other single licensee.[85] The Commission, as manager of the electromagnetic spectrum for the benefit of all Americans, has the final responsibility for finding and implementing a solution to these issues.

Almost any instance of CMRS – public safety interference involves multiple contributing factors relating to both CMRS and public safety operations. In the majority of cases, such interference can be mitigated through changes in the operations, equipment, or practices of the CMRS licensee, the public safety operator, or both. For example, the recent successes of Nextel and public safety communications officials in the Portland, Oregon metropolitan area in mitigating CMRS – public safety interference is the direct result of close cooperation among all affected mobile communications operators.[86] For its part, Nextel has retuned cell sites, implemented intermodulation-free

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[85] *See APCO Project 39 Report* at 6 ("it is our firm belief that interference exists anywhere low-HAAT/high-power (or extreme downtilt) sites in the 800 MHz band are operating within the operational footprint of 800 MHz radio systems designed under noise-limited principles. *We also believe this to not be a phenomenon isolated to Nextel sites in the footprint of public safety systems* [emphasis added]. Multiple public safety systems operating in the same geographic area could present the same challenge if their design philosophies differed, as could other commercial carriers.").

[86] *See, e.g.,* "Nextel Outlines Plan to Streamline Public Safety Communications in Oregon," Knight-Ridder Tribune Business News: The Oregonian, 2002 WL 24259584 (Jul. 14, 2002).

frequency plans, and adjusted antenna height and power. The City of Portland and Washington County Consolidated Communications Association officials have implemented upgrades to certain public safety receivers known to be lacking in intermodulation resistance, modified their frequency deployments, and introduced improved signal coverage in problem areas.

Similarly, in Anne Arundel County, Maryland, CMRS – public safety interference has occurred in areas where there are robust CMRS signals and relatively weak public safety signals. The County is combating this problem through receiver upgrades and the deployment of additional transmitter sites to provide more consistent and robust coverage. In addition, Nextel and Cingular have both introduced antenna and power changes, and revised frequency plans to coordinate with the County to minimize the likelihood of intermodulation products on County channels.

These combinations of remedial actions being taken by both public safety and CMRS operators are illustrative of the fact that CMRS – public safety interference typically results from a confluence of technical factors: relatively strong CMRS signals; relatively weak public safety transmissions (often far from a base station or near the edges of coverage); public safety receivers with sub-optimal intermodulation rejection performance characteristics; co-located CMRS cell sites enabling the signals of two or more CMRS providers to combine to create intermodulation products on public safety channels; and other similar situations in which the 800 MHz allocation-driven wideband sensitivity of public safety receivers makes them susceptible to signals from spectrally and geographically adjacent or nearby commercial systems. A number of developments

over the past several decades have allowed these technical elements to come together to cause CMRS-public safety interference in the 800 MHz band, including:

Interleaving of public safety and non-public safety operations. As noted above, a fundamental cause of CMRS – public safety interference is the interleaving of noise-limited public safety systems and interference-limited commercial operations throughout the Land Mobile Radio spectrum band. In the *NPRM*, the Commission recognized that its 800 MHz allocation plan is a primary underlying cause of CMRS – public safety interference. The Commission laid the groundwork for the 800 MHz band plan in 1974 when it reallocated former UHF television channels 70–83 and 35 MHz of federal government spectrum in the 800 MHz band to Land Mobile Radio Systems.[87] At the time of this new allocation, system engineers were concerned that assigning consecutive channels to a licensee for a multiple channel network would not work; *i.e.,* that contiguous channel assignments would create intra-system interference due to technical limitations on combiner technology. The Commission's overriding goal since then has been to prevent such intra-system interference by assigning channels one megahertz apart, rather than licensing contiguous channels.[88] This concern about creating intra-system interference was perpetuated not only in channel assignments, but in the Commission's spectrum allocation decisions as well; *i.e.,* public safety, private, and commercial providers are now interleaved, mixed, and adjacent to each other throughout

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87 *See 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*").

88 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.

the 806-816/851-861 MHz band. In addition, in 1986, the Commission established the allocation for the public safety NPSPAC band at 821-824/866-869 MHz, sandwiched between the upper 200 SMR channels and the cellular spectrum block.[89]

Given the spread of these different user channel pools across this 36 MHz frequency range (806–824/851–869 MHz), equipment manufacturers have been compelled to build public safety receivers capable of spanning this entire band.[90] Inherent in this design is heightened receiver vulnerability to unwanted adjacent and near channel transmissions. Public safety receivers "respond to" not only the desired transmissions from public safety communicators, but any strong B/ILT, SMR, CMRS (Nextel, Southern LINC, and cellular) transmissions as well; if the undesired signal is sufficiently strong, CMRS – public safety interference can occur. In fact, typical public safety receivers today respond to strong undesired signals on channels well into the cellular A-band allocation at 869–881.5 MHz. So long as these public safety and commercial channel allocations remain interleaved, it will be impossible to design receivers that will "hear" only public safety transmissions and filter out other systems' signals within the band.[91]

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89 *See NPSPAC Order*, ¶ 99.

90 Public safety handsets are able to receive and transmit on General Category channels, the lower 80 interleaved SMR channels, and the upper 200 SMR channels as well as on the 70 interleaved public safety channels and NPSPAC channels. Public safety systems were previously licensed on all of these channels.

91 Equipment designers must also take into account the thermal "drift" of bandpass or preselector filters in response to ambient temperature changes. As the temperature varies, the range of frequencies that pass through the receiver's front-end shifts up and down; the filters must therefore pass an even wider range of channels to ensure that the receiver "hears" the desired channels. Most public safety receivers "hear" and respond to RF energy in the adjacent 824-849/869-894 MHz cellular band with minimal signal strength attenuation. The broad frequency response of public safety receiver equipment

The development of cellularized SMR systems. In order to cover large geographic areas while minimizing the expenditure of scarce public funds, public safety agencies have typically deployed one or at most a few base stations in their systems, without any frequency reuse. With such "noise-limited" high-site, high power architecture, public safety operators have traditionally been able to provide service at low signal levels (as low as –105 dBm or less) until the desired signal cannot be distinguished from the background thermal noise in the receiver.

As long as public safety systems in the 800 MHz band were surrounded primarily by other high-site, high power, noise-limited systems, these operators experienced little interference. In the 1980's, however, the Commission encouraged 800 MHz SMR licensees to pursue flexible, innovative uses of their spectrum,[92] and in 1991 it specifically approved Nextel's proposed deployment of wide-area cellularized systems with digital, low-power, multiple base stations.[93] As a result, Nextel and other operators now use "interference-limited" designs featuring multiple, low-power base stations with intensive frequency reuse and mobile hand-off from cell to cell throughout a geographic area, thereby serving many times more users with the same quantity of spectrum. Ordinary operation of these systems can result in locally robust CMRS signals that are far

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permits multiple RF emissions from SMR transmitters, cellular transmitters, or mixtures of both to combine in a public safety receiver and produce interference.

[92] *See Amendment of Part 90, Subparts M and S, of the Commission's Rules,* Report and Order, 3 FCC Rcd 1838, ¶ 88 (1988), *aff'd.* 4 FCC Rcd 356 (1989) ("*SMR Flexibility Order*"). In its order, the Commission stated that "[t]he overriding concern with regard to mode of operation is that of allowing the SMR operators to have the flexibility to select and expeditiously put into operation the type of technology that serves their interests and the interests of their customers." *SMR Flexibility Order,* ¶ 90.

[93] *Request of Fleet Call, Inc.*, Memorandum Opinion and Order, 6 FCC Rcd 1533 (1991) *recon. dismissed*, 6 FCC Rcd 6989 (1991) ("*Fleet Call Order*").

stronger than distant public safety transmissions,[94] particularly within a few hundred meters of the CMRS base station. In the presence of such signal strength disparities, public safety systems can experience interference.[95] Such interference has become more likely, as the Commission acknowledges, with the unanticipated growth of public safety and commercial wireless traffic.[96]

Interference from cellular providers. Cellular operators must also accept a portion of the responsibility for the increasing incidence of CMRS – public safety interference. In their comments, a number of the cellular providers deny that they are contributing to CMRS – public safety interference.[97] These commenters assert that, even if cellular transmissions do contribute to this interference, the problem should be addressed with routine frequency planning and coordination with public safety communications systems, rather than the 800 MHz realignment proposed by Nextel and other parties herein.[98]

The facts do not support the cellular commenters' contentions. Cellular A-band signals have been identified as causing CMRS – public safety interference – either alone

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[94] Signal levels immediately around low-height CMRS sites are typically much stronger (*e.g.,* -25 to -40 dBm) than those from more distant high-height public safety transmitters (*e.g.,* -70 to -100 dBm or less).

[95] As Nextel has described previously, this disparity in signal strength can cause three different types of interference: intermodulation interference, wideband noise interference, and receiver overload interference. *White Paper* at 21-22.

[96] *Notice* ¶ 10.

[97] Comments of Cingular/Alltel at 2-4; Comments of U.S. Cellular at 3; Comments of Verizon Wireless at 6-7.

[98] Comments of AT&T Wireless at 2; Comments of U.S. Cellular at 3; Comments of Verizon Wireless at 8.

or in combination with Nextel signals – in numerous instances nationwide, including Anne Arundel County, Maryland; Denver, Colorado; Cherry Hills, Colorado; Sandy, Utah; Miami, Florida; suburban Philadelphia, Pennsylvania; Phoenix, Arizona; Maui, Hawaii; San Diego, California; Baltimore, Maryland; Portland, Oregon; and Seattle, Washington. These conclusions have been affirmed in a number of cases by independent expert third party review.[99]

While cellular involvement has been limited to the cellular A-band licensees, as public safety operators begin to use 700/800 MHz dual-band public safety radio equipment, they are likely to receive cellular B-band transmissions and intermodulation interference as well.[100] The cellular carriers' unseemly protestations of "innocence" place at risk the lives of public safety emergency response personnel and the public they serve. The time is at hand for posturing to end and for all parties to accept their fair share of responsibility for CMRS – public safety interference.

B. Nextel Has Operated in Full Compliance with the Commission's Rules and the Terms and Conditions of Its Licenses

Those who advocate imposing the entire burden of remediation on Nextel not only fail to appreciate the complex origins of CMRS – public safety interference, they also ignore the quality of Nextel's conduct as a Commission licensee. No legal justification exists for penalizing Nextel. Nextel has complied with all of the

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[99] For example, RCC Consultants, Inc., who filed comments in this proceeding, has investigated CMRS – public safety interference in Anne Arundel County, Maryland; LCC International, Inc. is completing a detailed study of CMRS-public safety interference issues in Phoenix, Arizona; and similarly in Denver, Colorado, Pericle is evaluating the City of Denver's ongoing interference concerns.

[100] This conclusion is based on Nextel's understanding of the dual-band receiver design and specifications. Nextel recognizes that other parties may draw different conclusions. Nextel will further explore this matter with the equipment manufacturers.

Commission's rules and the terms and conditions of its licenses,[101] and, following full investigation, the Commission has never attributed any public safety interference to non-compliant Nextel conduct. Moreover, as mentioned above, the Commission specifically authorized Nextel's digital cellular architecture in 1991. Since that time, the Commission has had numerous opportunities to restrict the development of cellularized SMR operations, including in its geographic overlay licensing proceeding in 1995,[102] but did not even consider doing so. The Commission has repeatedly acknowledged Nextel's operations as bringing vital competition to the commercial wireless industry;[103] it has never suggested that Nextel's use of its 800 MHz channels is somehow inappropriate. There is no basis for the Commission to reverse course at this late date or to make Nextel a scapegoat in this proceeding.

The Commission should also reject the arguments of commenters who assert that Nextel was the last to arrive at many cell sites and therefore should bear the full burden of curing CMRS – public safety interference.[104] This "last in fixes it" principle is not applicable where, as in the instant case, interference problems are inherent to a spectrum

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101 Counter to the assertions of a handful of commenters, Nextel has at all times complied with the Commission's general operating requirements in Sections 90.173 and 90.403, having taken all reasonable steps to avoid interference to public safety and other licensees. 47 C.F.R. §§ 90.173, 90.403. *See* Comments of United Telecom Council at 15-16; Comments of City of Baltimore at 4-5; Reply Comments of SBT at 8-9. Nextel has also complied with all other technical and operational requirements in Part 90, Subpart S that are applicable to its digital SMR system.

102 *See 800 MHz Report and Order.*

103 *See, e.g., Annual Report and Analysis of Competitive Market Conditions with Respect to Commercial Mobile Services*, Sixth Report, 16 FCC Rcd 13350, 13360 (2001); *Annual Report and Analysis of Competitive Market Conditions with Respect to Commercial Mobile Services*, Fourth Report, 14 FCC Rcd 10145, 10177-79 (1999).

104 *See* Comments of City of Austin, Texas at 2; Comments of County of Maui at 10.