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CRS Report for Congress
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Spectrum Policy: Public Safety and Wireless Communications Interference

Updated June 30, 2004

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Summary

Legislation has been introduced, and other legislation may be under consideration, for the 108th Congress regarding possible actions by the Federal Communications Commission (FCC) to relocate some public safety wireless users to new frequencies. There have been an increasing number of reported incidents of transmission interference with public safety communications, leading the FCC to consider proposals to mitigate certain types of interference. The interference usually takes the form of dropped calls or dead spaces with radio transmissions — primarily to or from first responders — in certain frequencies. Many of the impacted public safety frequency assignments are placed close to commercial frequencies. The predominate user of the frequencies that are interleaved with public safety radio operations is the wireless company Nextel Communications, Inc. The majority of documented incidents of interference have been attributed to Nextel's network.

The FCC is considering, as its solution to the problem indicated above, a plan based on a proposal from Nextel, first proffered in the form of a White Paper published in November 2001. The objective of the FCC's plan is to reassign frequencies in what is referred to as the 800 MHz band so that public safety users would be grouped together and interference reduced or eliminated. To achieve this, Nextel would vacate frequencies for reallocation to public safety and, in turn, frequencies vacated by public safety and others would be reassigned to Nextel. Nextel would be required by the FCC to pay an undetermined amount (Nextel has most recently suggested a cap of $850 million) to move public safety users to new assignments. To compensate Nextel for the loss of certain spectrum and for paying some of the costs of rebanding (the process of relocating to other frequencies), the FCC would provide new spectrum to Nextel. Controversy over Nextel's and other proposals has escalated to the point that the two major opposing viewpoints are documented through special websites. These are [http://www.consenusplan.org], for Nextel; and [http://www.Fix800Mhznow.com], prepared by the Cellular Telecommunications and Internet Association.

There are a number of policy questions that this plan raises for Congress. There are ongoing, unresolved debates about whether rebanding is necessary to eliminate interference, whether public safety users affected by rebanding will be fully compensated for the cost of relocating as part of a rebanding plan, and whether it is appropriate for the FCC to assign new spectrum for the use of a commercial entity without recourse to the auction process, which provides funds to federal general revenue. Other issues concerning spectrum policy have also been raised regarding the FCC's proposed plan. H.R. 4715 (Representative Nussle) addresses one of these issues — bypassing the auction process — with a proposed amendment to the Communications Act of 1934 [47 U.S.C. 309 (j) (1).]

This report will be updated.

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Spectrum Policy: Public Safety and Wireless Communications Interference

Introduction

Broadcasting — whether it be radio, television, wireless telecommunications or other transmission technology — is subject to various types of signal interference, even when operating within assigned frequencies. The Federal Communications Commission (FCC) regulates commercial radio, television, commercial wireless services, and state and local public safety and other non-federal users of radio frequency spectrum. Its primary tool in dealing with interference to wireless transmissions is to prevent it by the judicious allocation of radio frequencies, following band plans designed to preclude or minimize most types of interference. In the case of frequencies at 800 MHz, interference is being caused primarily by transmissions from commercial cell phone towers, many of which are part of Nextel Communications, Inc.'s "push to talk" network.[1] When the frequencies in the 800 MHz band were first assigned, the FCC did not anticipate that channels intended for short messages over commercial mobile radio (used by taxi dispatchers, for example) would be, with time, technology and soaring consumer demand for wireless service, converted to a heavily-trafficked national cell phone network (Nextel). The commercial spectrum allocations, therefore, were closely interleaved with public safety allocations, with the expectation that the (presumably) low-usage commercial assignments would act as buffers to possible interference among public safety channels.

The FCC is crafting a rebanding plan to consolidate public safety frequencies in the lower part of the 800 MHz band, while moving some of the 800 MHz channels acquired by Nextel to the higher end of the band. It would also assign new spectrum to Nextel at another frequency.[2] According to many sources, the FCC is not giving much weight to re-engineering solutions or the adoption of best practices to mitigate interference and thus avoid the need for relocation. Press reports characterize the internal debate at the FCC as one of how to carry out the relocation, not whether it

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[1] In a letter it filed with the FCC, dated May 16, 2003, Nextel writes: "Ten percent of all public safety agencies licensed at 800 MHz have reported experiencing interference from the lawful operations of Nextel [and others]." This letter and other comments can be found by going to the FCC Electronic Comment Filing System (ECFS) on the FCC website [http://www.fcc.gov/cgb/ecfs/]. In ECFS, click "Search for Filed Comments," insert "02-55" in the box marked "Proceeding," and then search the file

[2] "Nextel Lobbies For Bigger Share of Cellular Space," by Jeffrey H. Birnbaum and Yuki Noguchi, Washington Post, May 24, 2004, page A01.

is necessary.[3] Outside the FCC, the debate appears to be more wide-ranging but in general centers on whether it is in the public interest to give Nextel spectrum that could be auctioned for third-generation (3G) wireless services, or other uses. Media reports suggest that some opponents may legally challenge the FCC's right to assign to Nextel spectrum that could have been auctioned in a competitive marketplace.[4] Legislation that might forestall legal action has been proposed by Representative Nussle (H.R. 4715). The bill would modify the Communications Act of 1934[5] to put more specificity in Congressional guidelines for spectrum auctions.[6] The FCC has stated in public and semi-public fora that it believes it is acting within its charter to protect the public interest if it decides to carry out a relocation plan.[7] In this context, it is unclear whether provisions in section 309 (j) provide the justification the FCC claims to have or whether other sections of the Communications Act might be used to justify the proposed spectrum swap. In a lengthy letter to Chairman Powell, the General Counsel of Verizon, William P. Barr, expressed concern that the FCC has focused on the Communications Act as the source of its authority and not paid sufficient attention to other federal statutes[8] some of which contain proscriptions that are "criminal in nature."[9]

In Congress, Senator Ted Stevens, in his capacity as chairman of the Committee on Appropriations, wrote the FCC in March regarding this matter, stating his belief that — if Nextel were required to give up spectrum in a plan to prevent interference — the FCC would have the right to allocate new spectrum without putting it up for auction.[10] The letter also stated that while the Senator does "not have the technical background to judge the complex engineering issues," he hopes the FCC's engineers

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[3] For example, reports in the Washington Post, such as, "FCC Considers Nextel Spectrum Swap," March 10, 2004, Page E01 and "Cell Phone Trade Group Goes Against Nextel," April 30, 2004, Page E01, both by Yuki Noguchi.

[4] "Nextel Says Compromise Won't Work,"by Yuki Noguchi, Washington Post, May 12, 2004, page E01 and "FCC Likely to Reach Unanimous Decision on Nextel Spectrum," by Mark Wigfield, Dow Jones Newswires, May 18, 2004: "Any plan deemed to give one side an advantage is bound to be greeted by lawsuits."

[5] Communications Act of 1934, 47 U.S.C. 309 (j) (1).

[6] For information on the auction process, see CRS Report RL31764, *Spectrum Management: Auctions*.

[7] For example, at Senate staff briefing, March 16, 2004 and as reported in press accounts such as "FCC Backs Nextel's Plan For Airwaves," by Yuki Noguchi, Washington Post, April 8, 2004, page E01 and "Verizon Moves to Head Off Nextel Spectrum Swap," by Ken Belson, New York Times, April 9, 2004, page C04.

[8] Cited by Mr. Barr are: the Anti-Deficiency Act, 31 U.S.C. § 1341 (a) (1) (B); the Miscellaneous Receipts Act § 3302 (b); Section 641 of the criminal code 18 U.S.C. § 641; and the U.S. Constitution, article I § 9, cl. 7 ("No Money shall be drawn from the Treasury, but in Consequence of appropriations made by Law.")

[9] Letter dated June 28, 2004. This and other recent comments from Verizon and Verizon Wireless can be found by going to the FCC Electronic Comment Filing System (ECFS) on the FCC website [http://www.fcc.gov/cgb/ecfs/]. See footnote 1.

[10] Letter to the Honorable Michael K. Powell, Chairman, Federal Communications Commission, from Sen. Ted Stevens, March 26, 2004.

will "consider" resolution of the problem "without moving anyone . . . " The Senator also urged the FCC to make "various spectrum bands available for 3G uses and applications as soon as possible." Other stated concerns from members are about the source and amount of funding for relocation,[11] and some are also expressing concern that possible litigation[12] could delay resolution of the issue for a number of years, subverting one of the FCC's avowed intentions of acting "expeditiously"[13] to resolve the interference problems. Some observers contend that the FCC has not thoroughly studied solutions that do not require rebanding. Some also question whether a detailed cost-benefit analysis has been performed that would support the conclusion that the measurable benefits of relocation outweigh the measurable costs. The United Telecom Council (UTC) has expressed concern that the 800 MHz rebanding plan will cause unnecessary and unacceptable harm to critical infrastructure operations.[14]

Frequency Assignments for Public Safety

This report deals with radio frequency assignments for public safety use by states and localities. It does not discuss federal use of spectrum in meeting public safety communications needs. Federal radio use is managed primarily by the National Telecommunications and Information Administration (NTIA). The NTIA coordinates with the FCC and works closely with federal agencies such as the Federal Aviation Administration, with the Department of Defense, and with others involved in national security and defense, to assure the safe operation of broadcast transmissions vital to safety and security.

Currently, non-federal public safety wireless communications use VHF and UHF[15] frequencies below 512 MHz[16] and UHF frequencies in the 806-824/851-869 MHz ranges. At 4.9 GHz, the FCC has recently designated 50 MHz for public safety. Also, ultra-wideband technology has been provisionally approved to be used for public safety. Frequency assignments currently in use, therefore, total approximately

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[11] Letters to the Honorable Michael K. Powell, Chairman, FCC, from Members of the House of Representatives, February 13, 2004, Honorable Curt Weldon *et alia,* and February 26, 2004, Honorable Vito Fossella *et alia*.

[12] Legg Mason, the investment house, has ranked the probability of a judicial challenge as "high." Reported in Communications Daily, March 30, 2004, page 10 (Wireless section). Additional reports regarding the possibility of litigation include "New Objections to F.C.C. Deal With Nextel Over Spectrum," by Ken Belson, The New York Times, June 25, 2004, Final Edition, page 6.

[13] Letter to the Honorable Ted Stevens, U.S. Senate, from Michael K. Powell, Chairman, FCC, April 13, 2004.

[14] Letter dated June 28, 2004. This and other recent comments from UTC can be found by going to the FCC Electronic Comment Filing System (ECFS) on the FCC website [http://www.fcc.gov/cgb/ecfs/]. See footnote 1.

[15] Very High Frequency (VHF) and Ultra High Frequency (UHF) are transmitted in three bands in the United States — low VHF, high VHF and UHF.

[16] Frequency ranges 25-50 MHz; 150-174 MHz; 220-222 MHz (shared with federal agencies); 421-430 (three urban areas); 450-470 MHz; and 470-512 MHz (11 urban areas).

23.2 MHz.[17] New assignments for spectrum will eventually provide an additional 74 MHz (24 at 700 MHz and 50 at 4.9 GHz), not including ultra-wideband, which has limited applications.

Benefits of Rebanding

Radio frequency spectrum provides an invisible roadway for wireless transmissions; each band of measured spectrum is like a highway lane guiding communications to their destination. Radio frequency spectrum is measured, by speed, in cycles per second, or hertz (Hz).[18] Spectrum allocations are divided into channels. When many channels are within a designated spectrum band, the allocation is referred to as narrowband. Broadband has comparatively fewer channels and therefore greater capacity for sending images and other data at high speeds. Contiguous spectrum for broadband is important for advanced wireless applications. The term wideband is sometimes used in the telecommunications industry to describe limited broadband applications transmitted on narrowband channels. An example is "mobile data" networking for public safety. This system provides voice and data communications and supports interoperability for text messages. The possibility that contiguous spectrum for public safety at 800 MHz could be leveraged for better wideband applications[19] is one potential benefit of the rebanding proposals.

In 1995, at the request of Congress, the FCC and NTIA established the Public Safety Wireless Advisory Committee (PSWAC) to study public safety spectrum use and to make recommendations for meeting its spectrum needs. The following year, PSWAC submitted a report[20] concluding that "unless immediate measures are taken to alleviate spectrum shortfalls and promote interoperability, Public Safety agencies will not be able to adequately discharge their obligation to protect life and property in a safe, efficient, and cost effective manner."[21] Among PSWAC's recommendations to the FCC and NTIA was the request for 95 MHz of additional spectrum for state and local public safety needs. In response to the report, Congress directed the FCC to allocate 24 MHz of spectrum to non-federal public safety agencies from the 746-806 MHz range as part of the reallocation of channels to be cleared in the migration from analog to digital televison broadcasting.[22] This spectrum, generally, is not yet available to public safety users. In the relocation plan

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[17] "Final Report of the Public Safety Wireless Advisory Committee to the Federal Communications Commission and the National Telecommunications and Information Administration," September 11, 1996., Volume I, page 16; these estimates do not include bandwidth available only in some urban areas.

[18] Standard abbreviations for measuring frequencies include kHz — kilohertz or thousands of hertz; MHz — megahertz, or millions of hertz; and GHz — gigahertz, or billions of hertz.

[19] Nextel, in its filings regarding its proposal, maintains that there will be enough contiguous spectrum to support low-speed data, high-speed data and video.

[20] "Final Report of the Public Safety Wireless Advisory Committee to the Federal Communications Commission and the National Telecommunications and Information Administration," September 11, 1996.

[21] *Op. cit.*, page 2.

[22] "Balanced Budget Act of 1997," P.L.105-33, Title III.

currently under consideration by the FCC, there would be an increase in the amount of spectrum at 800 MHz potentially available to public safety. This also could be considered a benefit of the relocation plan.

Interference at 800 MHz

Public safety currently uses 9.5 MHz of spectrum in the 800 MHz range at 806-821MHz and 851-869 Mhz. At the behest of the National Public Safety Planning Advisory Committee (NPSPAC), frequencies at 821-824 MHz and 866-869 MHz, referred to as the "NPSPAC channels," are reserved for special public safety uses, such as interoperability. The allocation of this spectrum interleaves public safety and private commercial communications using narrow slices of spectrum. This close proximity of public and commercial utilization is widely believed to be the primary cause of interference to communications by public safety and other entities using 800 MHz channels. The problem has become sufficiently troublesome that APCO[23] established a committee that operates nationwide to identify cases of interference.[24]

Although many wireless carriers have been identified in resolving problems of interference, a large number of the documented cases of interference have been linked to operations of Nextel. To address the problem, Nextel prepared a White Paper[25] regarding use of the 800 MHz band and submitted it to the FCC in November 2001. The FCC subsequently assigned the paper a docket number. Comments on public safety communications uses in the 800 MHz band and related issues were sought by the FCC. Numerous solutions have been proposed. Amendments and *Ex Parte* comments are still being submitted.[26] By April 2004, over 1,500 records (some are duplicates) were on file with the FCC on issues raised by Nextel and others.

In the letter to the FCC that accompanied the White Paper,[27] Nextel specifically attributed interference problems to earlier actions by the FCC "authorizing public safety communications providers and [commercial] licensees to operate essentially incompatible systems on mixed, interleaved and adjacent 800

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[23] Association of Public-Safety Communications Officials — International. APCO helps coordinate frequency assignments for public safety and often assists the FCC in implementing spectrum policy for public safety.

[24] Project 39 Technical Committee at [http://www.apcointl.org/frequency/project_39/]. (Visited April 22, 2004.)

[25] "Promoting Public Safety Communications: Realigning the 800 MHz Land Mobile Radio Band to Rectify Commercial Public Radio - Public Safety Interference and Allocate Additional Spectrum to Meet Critical Public Safety Needs." Available at [http://www.fcc.gov/cgb/ecfs/]," under Nextel, docket numbers 00-258, 95-18, 99-81 or 99-87, dated November 21, 2001; see also footnote 1. (Visited May 25, 2004.)

[26] Comments can be found by going to the FCC Electronic Comment Filing System (ECFS) on the FCC website [http://www.fcc.gov/cgb/ecfs/]. See footnote 1.

[27] From Robert S. Foosaner, Senior Vice President and Chief Regulatory Officer, Nextel Communications, Inc., to Mr. Thomas Sugrue, Chief, Wireless Telecommunications Bureau, November 21, 2001.

MHz channels . . . Intermodulation is the dominant cause of interference, with wideband noise and receiver overload playing a secondary role." In the paper, Nextel presented a plan for spectrum realignment that would place public safety and commercial mobile radio services (CMRS) in separate blocks of contiguous spectrum. Nextel argued that the root cause of interference is the manner in which the spectrum has been allocated and that changing the allocation will eliminate the problem.

Nextel's Plan. The main feature of Nextel's proposal to reduce interference to public safety channels at 800 MHz is to swap channels so that public safety users would be consolidated in the lower part of the 800 MHz band, separated from commercial users in the upper 800 MHz band. Although Nextel would be taking some of the channels currently used by public safety, and surrendering others, it calculated that it would be losing the use of some spectrum. Also, Nextel offered to pay the cost of rebanding (the process of relocating to other frequencies) for public safety users. As compensation for the loss of spectrum and the assumption of some of public safety's rebanding costs, Nextel requested that it receive 10 MHz of spectrum at a higher frequency. Originally the requested spectrum was at 2.1 GHz but subsequent discussions with the FCC substituted spectrum at 1.9 GHz.

In order to complete the realignment, Nextel suggested that current occupants in the lower 800 MHz bandwidth for Specialized Mobile Radio (SMR) and for Business and Industrial/Land Transportation (B/ILT) might have to relocate. Among private wireless users that would be affected by such a move are businesses that use these frequencies for internal communications, such as to monitor off-site activities, or for applications such as automatic reading of utility meters. Users include manufacturers, railroads, pipelines and utilities. To implement its plan, Nextel offered to contribute up to $500 million (now raised to $850) to help fund the costs of relocating public safety systems and some of the SMR and B/ILT users currently operating within the 800 MHz band.

Other Plans. After the Nextel "Consensus Plan" was published, many associations and companies filed opinions with the FCC, often suggesting alternative solutions. Recent events have brought two major associations to the fore in opposing Nextel and its proposals. These are the Cellular Telecommunications and Internet Association (CTIA), whose membership encompasses many wireless companies, large and small, including Nextel and Verizon Wireless, and the United Telecom Council (UTC) an association that represents private network users, including B/ILT users and critical infrastructure industries.

The CTIA has supported several different proposals. Reportedly, the association now supports the position opposing allocation to Nextel of spectrum at 1.9 GHz without an auction process.[28] From the outset of public discussion, the CTIA has been among those protesting against the Nextel and "Consensus Plan" proposals. At one point, the CTIA advocated using 700 MHz frequencies for public safety. It urged that all the upper 700 MHz band be turned over for public safety and

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[28] "Cell Phone Trade Group Goes Against Nextel," by Yuki Noguchi, Washington Post, April 30, 2004, page E01.

critical infrastructure uses. While not submitting a detailed proposal, the CTIA filed comments with the FCC urging it to move public safety and B/ILT users from 800 MHz to the 700 MHz band; an interim step would require rebanding within 800 MHz to mitigate interference. The CTIA maintained that it was "irresponsible" of the FCC to address problems in the 800 MHz band without including uses at 700 MHz and the need for more spectrum for public safety. The CTIA recommended that the 800 MHz frequencies used by public safety and B/ILT be auctioned, with the proceeds used to cover costs of relocation.

Subsequently, the CTIA joined forces with the UTC and others to support what they called the "Balanced Approach." In an Ex Parte filing,[29] the "800 MHz User Coalition" urged that technical steps and administrative measures be taken to eliminate interference. More recently, the CTIA has championed a plan that supports rebanding but would require Nextel, among other conditions, to put aside $3 billion toward the cost of moving public safety to new channels and accept spectrum at 2.1 GHz instead of 1.9 GHz.[30] The FCC reportedly announced that it is reconsidering its spectrum offer to Nextel and is favoring assigning Nextel the 2.1 GHz frequency after all.[31]

Costs of Rebanding

As noted above, many question whether the rebanding is necessary. They would prefer to see the FCC require Nextel to modify its equipment to eliminate the problem.[32] Adoption of "best practices" has been advocated by Motorola, Inc., among others.[33] The Spectrum Management Committee of the Association of Public Safety Communications Officials - International, the group that performed many of the evaluations of interference, reportedly supports the rebanding plan and affirms the desirability of placing public safety channels at 800 MHz close to those

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[29] WT Docket No. 02-55, June 11, 2003 see footnote 1.

[30] Letter from Steve Largent, President, CTIA to Michael K. Powell, Chairman, FCC, April 29, 2004, Docket No. 02-55,see footnote 1. Also reported in "CTIA Floats Compromise Plan for 800 MHz Proceeding," Communications Daily, May 3, 2004, page 1.

[31] "Spectrum Swap Plan Revisited; FCC May Ask Nextel To Accept Alternative," by Yuki Noguchi, Washington Post, April 24, 2004, page E01.

[32] Also reported, for example, in "FCC May Let Nextel Swap Airwaves,"by Paul Davidson, USA Today, March 10, 2004 and "Emergency Communications" The Miami Herald, April 6, 2004, page A08.

[33] Motorola, Inc. has filed multiple comments and proposals with the FCC for this docket, including several presentations explaining the causes of interference. It has urged that problems with interference be further eased through the adoption of the "Best Practices Guide," developed by APCO's Project 39, used during the Winter Olympic Games at Salt Lake City; see footnote 1.

designated for 700 MHz.[34] Vincent Stile, APCO chairman, has described Nextel's Consensus Plan as "the only comprehensive way to prevent interference."[35]

In evaluating the possible costs associated with rebanding, opinions diverge on what should be included as a reimbursable cost; whether the true costs — taking into account rebuilding infrastructure (such as replacing antennas), and disruption and downtime — will be fully covered; and what should be the replacement technologies for equipment covered in the proposal. In early 2002, Motorola prepared cost estimates for the Nextel plan.[36] It estimated relocation costs for public safety at $1.1 to $1.5 billion; the estimated cost for B/ILT and others was put at $1.7 to $2.4 billion. Total costs of relocation under Nextel's proposal would, according to Motorola's calculations, range from $2.8 to $3.9 billion. To prepare these estimates, Motorola assumed that all equipment operating on 800 MHz frequencies would have to be retuned or replaced, and that 30 to 40% of radios would have to be replaced. The spread in the estimates was attributed to uncertainties such as the number of times a system might have to be moved in order to maintain full radio coverage during the rebanding. The lower estimates are based on changing frequencies only once. An Annapolis-based company that specializes in public safety communications, Concepts to Operations, Inc. (CTO) prepared a report on the "probable costs" of rebanding under the "Consensus Plan," submitted October 31, 2003.[37] Using many of the same assumptions as Motorola, but including estimated costs for changes in infrastructure, CTO concluded that the cost of rebanding would be $3.36 billion.

Spectrum and Wireless Competition. Another dimension of the cost aspect is the value of the spectrum that Nextel would receive. Nextel has maintained that the value of the spectrum it is relinquishing plus the costs of rebanding totals approximately $4 billion, and that this sum represents "fair" compensation for the 10 MHz of spectrum at 1.9 GHz it hopes to receive.[38] To counter Nextel's claim, Verizon Wireless commissioned a study from an appraisal firm that set at $7.2 billion the value of the spectrum Nextel would receive from relocation and the new allocation.[39] The "fair market value" of the 10 MHz of spectrum at 1.9 GHz was appraised at $5.28 billion.[40] Subsequently, Verizon Wireless went on record with a commitment to the FCC that it would start the bidding for spectrum at 1.9 GHz, if

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[34] "FCC Closes in on 800 MHz Decision," by Glenn Bischoff, Mobile Radio Technology, April 1, 2004, page 4.

[35] Letter to the Honorable John McCain, February 24, 2004, from Mr. Stile, available at [http://apcointl.org/JointlettertoMcCain.htm]. (Viewed May 27, 2004.)

[36] Filed May 6, 2002, WT Docket No.02-55; see footnote 1.

[37] The cost analysis was prepared for Preferred Communications System, Inc. and filed with the FCC by Preferred Communications System, March 1, 2004; see footnote 1.

[38] "Nextel Lobbies For Bigger Share of Cellular Space," by Jeffrey H. Birnbaum and Yuki Noguchi, Washington Post, May 24, 2004, page A01.

[39] Study by Kane Reese Associates, October 23, 2003, submitted to the FCC by Verizon Wireless on October 27, 2003, WT Docket No. 02-55; see footnote 1.

[40] Communications Daily, October 28, 2003, page 5 (Wireless section).

auctioned, at $5 billion.[41] The FCC responded to concerns of a "windfall" for Nextel by conducting an internal assessment of frequencies at 800 MHz and 1.9 GHz, and reportedly concluding that the value of all the spectrum going to Nextel under the "Consensus Plan" was $1.3 billion to $1.5 billion more than Nextel's estimate.[42] The wireless company would be expected to pay the difference, according to the FCC, with the funds possibly held until authorized relocation costs had been covered and the balance turned over to the U.S. Treasury, current practice for auction revenues.[43]

The possibility of holding spectrum-auction revenue in a special fund in order to pay for public safety's (and possibly private users') relocation costs has been raised by industry observers such as Michael Calabrese, New America Foundation. Mr. Calabrese has proposed amending H.R. 1320 (Commercial Spectrum Enhancement Act, Representative Upton) — a bill that would create a Spectrum Relocation Fund to cover the costs of moving federal users from spectrum wanted by the commercial wireless industry to provide 3G and other high-speed services — to include public safety. This proposal would add proceeds from the auction of spectrum at 1.9 GHz to the fund, with revenues used to cover relocation costs at 800 MHz. He has voiced the opinion that Congress' focus on homeland security would make it open to including public safety in a trust fund plan.[44] Whereas H.R. 1320 deals exclusively with federal users from a limited number of departments and agencies, a relocation plan for public safety might potentially be required to reimburse thousands of state and local users[45] for expenditures that are not necessarily federally funded today. A bill to fund public safety communications — but not specifically to cover costs related to relocation to abate interference — was introduced in October 2003 by Representative Stupak (H.R. 3370, Public Safety Interoperability Implementation Act).[46]

The potential loss of revenue from assigning spectrum instead of auctioning it has been questioned by many, sparking public debate about such issues as the value of spectrum, competition in the wireless industry and the fairness of allocation policies — past and present. Nextel has said that it no longer wants spectrum at 2.1

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[41] Verizon press release, April 8, 2004, "Valuable Spectrum Auction Would Raise Minimum $5 Billion for U.S. Treasury; FCC Considering Multi-Billion Dollar Give-away . . ." Verizon News Center [http://news.vzw.com/news/2004/04/pr2004-04-08e.html]. (Viewed May 27, 2004.)

[42] "FCC Backs Nextel's Plan For Airwaves,"by Yuki Noguchi, Washington Post, April 8, 2004 page E01.

[43] Comments by John Muleta, Chief, Wireless Telecommunications Bureau, FCC, at Senate staff briefing, March 16, 2004.

[44] Comments made at New America Foundation policy forum, "Nextel's Spectrum Windfall," April 7, 2004; press reports include "FCC Stalls 800 MHz Vote," by Heather Forsgren Weaver, RCR Wireless News, April 12, 2004, page 1.

[45] SAFECOM estimates 50,000 local and state public safety agencies and organizations. The SAFECOM Program is explained at [http://www.safecomprogram.gov/about.cfm]. (Visited May 24, 2004.)

[46] See CRS Report RS21508, *Spectrum Management: Special Funds*.

GHz.[47] The company has been offering wireless broadband services in a trial — testing innovative technology operating at 1.9 GHz — covering 1,300 square miles in the Raleigh-Durham, North Carolina area. The reported success of the trial could pave the way for a nationwide roll-out of a profitable new service, if Nextel gains the use of the 1.9 GHz spectrum.[48] In an effort to sway the FCC in favor of allocating spectrum to Nextel at 1.9 GHz, the company has revised its Consensus Plan offer with a proposal to transfer to public safety an additional 2 MHz of spectrum at 800 MHz.[49] According to a summary that accompanied the new offer, Nextel values its total "spectral and financial support" for the Consensus Plan at $5.155 billion, as follows:

Nextel's Valuation of the Cost of Its Support

Retuning Public Safety and Private Wireless	850,000,000
Retuning Nextel	400,000,000
Additional Filters at Nextel Base Stations	288,000,000
Spectrum Provided for Public Safety, 4.5 MHz at 800 MHz	2,590,000,000
Spectrum Provided as Protective Buffers, 4 MHz at 700 MHz	350,000,000
Clearing 1.9 GHz Spectrum of Existing Users	512,000,000
Total	**5,155,000,000**

An unidentified source reportedly observed that the offer exacts a sacrifice from Nextel and this should have some weight on the FCC's decision. "They were kind of looking for something to sweeten the pot," the source is quoted as saying. "They're giving up two more megahertz of spectrum, and spectrum that's valuable. That's going to weigh [on Chairman Powell]. How much is hard to say."[50] More recent reports say that Chairman Powell has decided to support Nextel's request for spectrum at 1.9 GHz.[51]

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[47] "Nextel Says Compromise Won't Work," by Yuki Noguchi, Washington Post, May 12, 2004, page E01.

[48] Communications Daily, April 15, 2004, page 8 (Wireless section) and "Nextel Begins Selling Wireless Broadband," by Yuki Noguchi, Washington Post, April 15, 2004, page E05.

[49] *Ex Parte* presentations by Nextel to the FCC, June 2 and June 4, 2004, filed on June 4 and June 7, 2004; see footnote 1.

[50] "Nextel Offers Public Safety More Spectrum," Communications Daily, June 8, 2004 (Today's News section).

[51] "FCC Chairman Sides With Nextel on Disputed Airwaves," by Yuki Noguchi, (continued...)

Public Policy and Spectrum Management

Public policy action on spectrum could be described as two-speed. The faster speed is for legislation or regulation that can potentially be accomplished within a two-year congressional cycle. The slower, long-term, speed prevails for major changes in spectrum policy that address such complex issues as fostering fairness, competition, new technology, and spectrum efficiency. This report has focused on an immediate, short-term question before the FCC. The issue, however, is embedded in the broader issue of how to manage spectrum as a public resource using free-market principles. Given the right new technology, spectrum is potentially infinite, but today its use is constrained by existing technology; should policy therefore focus on allocating spectrum within current constraints or focus on research that would free it from such constraints? Should spectrum be sold at auction or only leased, with regular price revisions? If spectrum is sold, should the rights to its use be transferred to the new owner without restrictions? Who should benefit from revenue acquired by spectrum sales or licensing? In what ways is spectrum policy kin to other federal policies and debates, such as those related to energy and natural resources? Is it possible to separate certain aspects of spectrum policy and act upon them without treating the body as a whole? Is there a comprehensive spectrum policy for public safety?

A short list of public safety communications issues currently of concern to Congress might include assuring interoperability of communications support for first responders; providing funds to buy and upgrade communications equipment; promoting standards for radio efficiency and interoperability; and expediting the transfer of spectrum, now controlled by television broadcasters, that Congress has designated for public safety use (Balanced Budget Act of 1997, P.L. 105-33, Title III).

The desirability of providing more spectrum — more frequency assignments — for public safety communications and of taking aggressive action to eliminate interference on public safety frequencies has recently been reaffirmed by the FCC in a series of presentations to congressional staffers and statements to the press.[52] The proposed actions, however, relate exclusively to the 800 MHz band. The FCC has retreated from efforts to expedite the availability of designated channels in the 700 MHz band.[53] Also, the FCC has so far declined to take action on complaints concerning interference on public safety channels in New Jersey and California that are caused by digital TV broadcasts.[54]

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[51] (...continued)
Washington Post, June 24, 2004, page E01.

[52] For example, Capitol Hill briefings by the FCC's Wireless Telecommunications Bureau for congressional staffers, March 2004.

[53] Additional information is in CRS Report RS21570, "Spectrum Management: Public Safety and the Transition to Digital Television."

[54] "Boston TV Station Disrupts Camco Police System," by Jason Laughlin, Courier-Post, Lindenwold, NJ, November 1, 2002. and "Request for Issuance of Cease and Desist Order (continued...)

The FCC's effort to provide a solution to mitigate certain types of interference addresses a small part of spectrum management and policy as regards public safety. Some ask: where is the broad-based, long-term plan that spells out the FCC's policy on spectrum use and public safety communications technology? Arguably, such a plan might provide a context for understanding the issues regarding interference at 800 MHz and give guidance for an equitable solution based on intrinsic merits instead of a drawn-out battle of claims and counter-claims, as reported in the press.[55]

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[54] (...continued)
Station KSEE - Channel 16 DTV, Fresno, CA," letter to Spectrum Enforcement Division, FCC from Elizabeth R. Sachs, Lukas, Nace, Gutierrez & Sachs, February 3, 2004.

[55] For example, "Arguments Over Spectrum Swap May Drown Out Valued Voices for the FCC," by Mark Rockwell, Wireless Week, April 15, 2004, page 12. The amassing of "fire power" for a "major regulatory showdown," is described in "Nextel Lobbies For Bigger Share of Cellular Space," by Jeffrey H. Birnbaum and Yuki Noguchi, Washington Post, May 24, 2004, page A01.