Before the
Federal Communications Commission
Washington, DC 20554

In the Matter of	)	
	)	
Additional Spectrum for Unlicensed Devices	)	ET Docket No. 02-380
Below 900 MHz and in the 3 GHz Band	)	

REPLY COMMENTS OF AT&T WIRELESS SERVICES, INC.

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Pursuant to Section 1.415 of the Commission's rules,[1] AT&T Wireless Services, Inc. ("AT&T Wireless") respectfully submits these reply comments to the *Notice of Inquiry* ("*NOI*") in the above-captioned proceeding.[2]

INTRODUCTION AND SUMMARY

In response to the Spectrum Policy Task Force Report released last fall,[3] AT&T Wireless urged the Commission to develop a sound spectrum management plan that would encourage the deployment of wireless networks and innovative services for American consumers.[4] To that end, AT&T Wireless commended the Report's recommendation to continue the transition to more market-oriented spectrum policies, including the exclusive use licensing model and a robust unlicensed spectrum policy. AT&T Wireless noted, however, that market forces alone cannot substitute for sound spectrum management.

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[1] 47 C.F.R. §§ 1.430, 1.415(c) (2002).

[2] *Additional Spectrum for Unlicensed Devices Below 900 MHz and in the 3 GHz Band*, ET Docket No. 02-380, Notice of Inquiry, 17 FCC Rcd. 25632 (2002); *see also Additional Spectrum for Unlicensed Devices Below 900 MHz and in the 3 GHz Band*, ET Docket No. 02-380, Order Granting Extension of Time, 18 FCC Rcd. 6234 (OET 2003) (extending comment deadline to April 17, 2003 and reply comment deadline to May 16, 2003).

[3] Spectrum Policy Task Force, ET Docket No. 01-235, Report (rel. Nov. 15, 2002) ("SPTF Report").

[4] *See* Comments of AT&T Wireless Services, Inc. to the Spectrum Policy Task Force Report in ET Docket No. 02-135, at 1 (Jan. 27, 2003) ("AT&T Wireless SPTF Comments").

Spectrum users and, in turn, the capital markets require sufficient "rules of the road" – including a clear and enforceable interference protection regime – in order to invest in the development and build-out of wireless networks. Too much uncertainty in spectrum-based policy, even under the guise of "market-based principles" and "flexibility," will stunt investment, innovation, and deployment.

Based on themes that emerged in the initial round of comments, AT&T Wireless identifies below three basic principles the Commission should apply as it further develops its policies for unlicensed spectrum and use: (1) unlicensed operations are an important element of spectrum policy; (2) unlicensed operations must not cause harmful interference; and (3) unlicensed operations should develop in spectrum dedicated for such use. AT&T Wireless applauds the innovative applications that have developed in unlicensed spectrum and believes that unlicensed operations can complement licensed services. The comments, however, demonstrate the difficulties in trying to "shoehorn" new unlicensed uses into bands with incumbent users and the fact that interference avoidance technologies are still in the developmental stage. It would be unwise for the Commission to base its regulatory decisions regarding unlicensed operations on hoped-for or anticipated advances in technology. The Commission thus should avoid "packing" more operations into intensively used spectrum bands and instead seek to find spectrum that could be dedicated to unlicensed use, notably in bands above 5 GHz.

Although some of the comments suggest that there may be ways to introduce unlicensed use into spectrum used by the broadcast services in 900 MHz, under no circumstances should the Commission consider introducing such operations into spectrum licensed for mobile services. The complexities of the mobile environment are too great to devise a regulatory regime that would protect licensees from harmful interference. AT&T Wireless, therefore, opposes any consideration of unlicensed operations in spectrum below 900 MHz that is allocated or authorized for mobile use, including the 698-806 MHz band. With regard to the 3650-3700 MHz band, it appears that this spectrum may offer possibilities for unlicensed operations, but the interference issues raised by incumbent licensees in the band must be adequately addressed before the Commission proceeds further.

As the Commission moves forward to explore the issues raised in the Spectrum Policy Task Force Report, it must develop a sound policy framework to guide its actions—particularly with regard to unlicensed uses. Reliance on promises of future interference avoidance capability will only place the Commission in the role of cheerleader, not informed decisionmaker. The Commission cannot engage in effective spectrum management until it develops a more complete understanding of the interference environment. The Commission's next spectrum policy initiative thus should be a comprehensive inquiry into the noise and interference environment.

I. THE COMMISSION SHOULD AFFIRM THREE PRINCIPLES AS IT CONTINUES TO DEVELOP ITS UNLICENSED SPECTRUM POLICY.

Three basic principles of unlicensed spectrum policy emerge from the comments submitted in the initial round. AT&T Wireless believes that these principles should guide the Commission as it considers how to balance the needs of licensed and unlicensed users of the spectrum. With this foundation, the Commission can begin to establish an unlicensed spectrum policy framework that will enhance opportunities for unlicensed use, protect licensed users, and foster investment and innovation by all spectrum users.

A. Unlicensed Operations Are an Important Element of Spectrum Policy.

Like many of the commenters, AT&T Wireless concurs with the statement in the *NOI* that "[t]he Commission's rules for unlicensed transmitters have been a tremendous success."[5] The Commission's 1985 decision to permit spread spectrum transmitters to operate up to one watt on an unlicensed basis in bands allocated for Industrial, Scientific and Medical ("ISM") equipment created unprecedented

[5] *NOI*, 17 FCC Rcd. at 25634, ¶ 6. *See, e.g.*, Comments of Cox Broadcasting, Inc. at 1 ("The Commission's unlicensed operation policies thus far have been extremely successful."); Comments of Intel Corporation at 4 ("[S]ignificant changes were made to the Commission's rules . . . that fostered innovation and commercial success.").

opportunities for the introduction of innovative unlicensed wireless devices.[6] A wide variety of devices have since been deployed, including cordless telephones, home security systems, electronic toys, inventory control, wireless headsets, wireless computer peripherals such as printers and keyboards, local area networks, and even last mile broadband connections.[7] The economy, businesses, and consumers have benefited greatly, leading one commenter to note that "life without" unlicensed devices would be "all but unimaginable."[8]

AT&T Wireless further believes that unlicensed services can complement services offered by licensed providers.[9] CMRS carriers, for example, are already combining unlicensed applications with their own licensed offerings to provide customers with additional services and capabilities. In January 2003, for example, AT&T Wireless introduced GoPort[SM], a Wi-Fi data service that keeps mobile professionals connected to their corporate information while away from the office. AT&T Wireless also announced an agreement with Wayport, a leading Wi-Fi service provider, that allows AT&T Wireless customers to roam on Wayport's Wi-Fi networks in 10 airports and more than 475 hotels across the United States.[10] Together, licensed and unlicensed networks can offer customers an innovative, appealing package of wireless services.

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[6] *See* Joint Comments of Intersil Corporation and Symbol Technologies, Inc. at 5 ("[R]eliability has improved dramatically, helped in large part by the Commission's spread spectrum rules, first adopted in 1985.").

[7] *See NOI*, 17 FCC Rcd. at 25634, ¶ 6.

[8] Comments of the Land Mobile Communications Council at 4.

[9] *See* Comments of Ericsson Inc at 4 (noting that licensed and unlicensed operations can offer "a full range of wireless products and services" and, as a result, licensed and unlicensed systems "can complement one another.").

[10] *See* Press Release, *AT&T Wireless to Offer Wi-Fi Service at Airports and Hotels Throughout US*, (Jan. 28, 2003), http://www.attws.com/press/releases/2003_releases/012803_wifi.jhtml.

Looking ahead, AT&T Wireless urges the Commission to remain committed to identifying additional opportunities for unlicensed operations, provided such action is consistent with the policies set forth below.

B. Unlicensed Operations Must Not Cause Harmful Interference to Licensed Services.

As the Commission moves forward in promoting unlicensed technologies, it must be unequivocally committed to protecting the operations of licensed spectrum users who have spent billions of dollars to build networks that serve hundreds of millions of consumers today. As noted in the *NOI*, operation of an unlicensed device under Part 15 is subject to the conditions that the device not cause harmful interference to authorized services, and that the device must accept any interference.[11] Numerous commenters emphasize that the non-interference condition is – *and must remain* – a bedrock principle of unlicensed operations.[12] As the Spectrum Policy Task Force noted, "sufficient interference protection is a necessary and fundamental building block in any spectrum policy."[13]

Several commenters highlighted the importance of the Part 15 interference protection regime and noted that reliance on enforcement actions to eliminate interference problems does not work in an unlicensed environment, especially when potentially interfering devices are mobile in nature and their transmissions are intermittent.[14] As Cox noted, "[w]ith rules prohibiting actual interference from unlicensed devices virtually impossible to enforce, the error cost of locking-in some flawed design is high."[15]

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[11] *See NOI*, 17 FCC Rcd. at 25632-25633, ¶ 2 (*citing* 47 C.F.R. § 15.5).

[12] *See, e.g.*, Comments of Motorola, Inc. at 2; Comments of the Satellite Industry Association at 4.

[13] SPTF Report at 25.

[14] *See, e.g.*, Comments of Cox Broadcasting, Inc. at 7; Comments of APCO at 2; Comments of Cingular Wireless LLC at 9; Comments of the Rural 700 MHz Band Licensees at 5.

[15] Comments of Cox Broadcasting, Inc. at 7.

AT&T Wireless also emphasizes that the Commission must not curtail licensees' rights as it considers new ways to facilitate access to spectrum by new users. In joint comments, Intersil Corporation and Symbol Technologies suggested that earth station licensees could modify their networks to protect themselves from unlicensed device interference.[16] The joint commenters' proposal, however, ignores the cornerstone of the Commission's unlicensed rules and policies – that unlicensed devices must not cause harmful interference to, and must accept interference from, licensed services. Incumbent licensees should not be compelled to adjust their operations in order to avoid interference from unlicensed users. Such action would ill-serve the Commission's goal of efficient spectrum utilization by raising substantial uncertainty regarding the rights accorded to licensees. The Commission must act deliberately and prudently in considering novel unlicensed operations to ensure that licensed users are protected from harmful interference.

In particular, the Commission should avoid steps that threaten to undermine the paradigm example of its exclusive use, flexible rights licensing model – CMRS.[17] As Cingular Wireless noted, "the Commission should ensure that sharing does not penalize the most innovative and efficient users of radio spectrum."[18] The introduction of new unlicensed operations into licensed spectrum, however, could have the opposite effect. As AT&T Wireless noted previously, "The Commission must avoid sacrificing the benefits of the exclusive use, flexible rights model by overemphasizing the Task Force's competing policy goal of increasing access to already-licensed spectrum by other users and devices."[19]

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[16] *See* Joint Comments of Intersil Corporation and Symbol Technologies, Inc. at 6-7.

[17] *See* SPTF Report at 46.

[18] Comments of Cingular Wireless LLC at 6.

[19] AT&T Wireless SPTF Comments at 5.

C. Unlicensed Operations Are Best Developed in Spectrum Dedicated for Such Use.

Like many of the commenters, AT&T Wireless urges the Commission to set aside future bands of spectrum for unlicensed use, particularly in higher frequencies.[20] One commenter asserted that "the [unlicensed] industry's accomplishments justify dedicated spectrum."[21] AT&T Wireless previously expressed support for the Spectrum Policy Task Force recommendation that the Commission primarily adopt the exclusive use model in spectrum below 5 GHz and identify spectrum dedicated to unlicensed use in higher bands and "particularly above 50 GHz."[22] As Cingular Wireless noted, "technology deployments are making increased use of higher frequencies available for new uses."[23] The Commission should facilitate the use of the higher frequency bands by unlicensed devices rather than pack new unlicensed operations into intensively used spectrum bands. To this end, AT&T Wireless applauds the Commission's recent decision to initiate a proceeding to consider making spectrum available for unlicensed use in the 5.470-5.725 GHz band.[24]

II. NO REAL-WORLD SOLUTIONS HAVE BEEN IDENTIFIED TO OVERCOME THE INTERFERENCE ISSUES RAISED BY THE *NOI*, ESPECIALLY TO LICENSED MOBILE SERVICES.

A. Interference Avoidance Technologies Are Still in Development and in Any Event Cannot Address the Complexities Found in a Licensed Mobile Environment.

Numerous commenters lay bare a fundamental problem in the present discussion of unlicensed operations in the subject bands: interference avoidance technologies do not currently exist to protect

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[20] *See e.g.*, Comments of Motorola, Inc. at 3; Comments of Ericsson Inc at 3.

[21] Joint Comments of Intersil Corporation and Symbol Technologies, Inc. at 1.

[22] SPTF Report at 39.

[23] Comments of Cingular Wireless at 12 (citing SPTF Report at 19).

[24] *See* Press Release, *FCC Proposes Additional Spectrum for Unlicensed Use,* ET Docket No. 03-122 (rel. May 15, 2003).

authorized services from harmful interference.[25] Despite claims by some commenters that the technologies are available or soon will be, the Consumer Electronics Association clarified that the interference solutions identified in the *NOI* have "yet to be defined, documented and tested."[26] As the Association for Maximum Service Television, Inc., the National Association of Broadcasters, and the Association of Public Television Stations observed,

> [t]echnologies allowing unlicensed devices to detect spectrum availability and, if necessary, to change frequencies in order to avoid interference are still in development and certainly have not been subject to the rigorous testing needed to determine whether they are effective in preventing interference in real-world settings . . . .[27]

AT&T Wireless agrees with these comments and the comments of the Land Mobile Communications Council, which note that regulatory decisions "based on anticipated advances in technology are dangerous, and should await the demonstrable existence of such technology at reasonable costs for widespread deployment."[28]

According to some of the commenters, however, it may be possible "at least in principle" to introduce new unlicensed use into the unused portions of certain spectrum bands – namely, those used by services employing fixed transmitters – without causing harmful interference to licensed spectrum users.[29] In such spectrum, an unlicensed device conceivably could identify its location and the location of fixed

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[25] *See e.g.*, Comments of American Mobile Telecommunications Association, Inc. at 2 ("the filings submitted on this subject in response to the [Spectrum Policy Task Force] report by members of the equipment manufacturing community cast serious doubt on the value of pursuing this concept at this time."); Comments of the Land Mobile Communications Council at 4 ("[T]echnology has not yet reached the FCC's expectations.").

[26] Comments of the Consumer Electronics Association at 6.

[27] Comments of MSTV/NAB/APTS at 3.

[28] Comments of the Land Mobile Communications Council at 5 (quoting TIA Comments to the Spectrum Policy Task Force Report in ET Docket No. 02-135, at 3 (Jan. 27, 2003)).

[29] Joint Comments of Intersil Corporation and Symbol Technologies, Inc. at 8; *see also, e.g.*, Comments of Motorola, Inc. at 1 (observing that increased use of the TV broadcast spectrum is "feasible, provided that the existing and future licensed users in such spectrum are adequately protected."). Services that employ fixed transmitters include broadcast, terrestrial fixed, and fixed satellite operations.

facilities, and operate on non-interfering channels. However, in addition to the technology issues that must be resolved, there are more fundamental RF interference questions that have not yet been examined. First, as discussed further below, the Commission must gain a better understanding of the current RF environment and the impact that new types and levels of interference could have on spectrum users' current operations and their ability to innovate in the future.[30] Second, after that analysis is completed, the Commission must then develop an interference framework or methodology to consider whether "open frequencies" or "unused portions" of authorized spectrum exist that could be appropriate for unlicensed use.[31] Given the issues at stake – the ability of licensees to offer innovative, high-quality services using spectrum many acquired at auction – blackboard engineering will not suffice; the Commission must engage in real-world studies and analysis before it can assess the potential consequences of new unlicensed proposals.

Even if it is possible for unlicensed uses to share with non-mobile services, the comments make clear that under no circumstances should the Commission seek to introduce unlicensed operations in frequency bands used for mobile services. "[U]nique difficulties" in licensed mobile spectrum "prevent adequate safeguards to protect licensed operations from interference."[32] In reaching this conclusion, Motorola noted:

> In general, [with] the dense spectral reuse, area licensing with no database of individual base stations, and high degree of mobility for mobile and portable radios . . . there is no readily apparent technological solution that would enable unlicensed secondary use without causing harmful interference to licensed services.[33]

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[30] *See infra* Part III.

[31] *NOI*, 17 FCC Rcd. at 25637-25638, ¶¶ 13 & 14.

[32] Comments of Motorola Inc. at 2.

[33] *Id.* at 5.

Even proponents of unlicensed use recognize that technology is not prepared to protect mobile operators from harmful interference. As Intel observed, "the static, fixed nature of TV broadcasting makes sharing much easier than would be the case for services operating on an intermittent or mobile basis."[34]

B. The Commission Must Address the Unique Issues Raised in Spectrum Below 900 MHz and in the 3650-3700 MHz Band Before It Proposes Unlicensed Use.

1. Below 900 MHz

For the reasons discussed above, AT&T Wireless joins those commenters that oppose any consideration of unlicensed operations in spectrum bands that are allocated for mobile use. Below 900 MHz, "the Commission should not allow any increased unlicensed use of broadcast spectrum where mobile operations exist or will be deployed, *i.e.*, in the 470-512 MHz or 698-806 MHz bands."[35]

APCO expressed deep concern with any consideration of allowing unlicensed operations in the 470-512 MHz and 764-776/794-806 MHz bands, which are used or allocated for public safety mobile services. APCO notes that current technology does not allow for interference-protected frequency sharing, "and any such future technology must first be proven" in other bands.[36] The same interference threats and technological realities hold true for the commercial mobile bands in the 700 MHz band as well.[37]

No technology is available to protect licensed mobile operations, and unlicensed use of these bands would inject substantial uncertainty into the value of the 700 MHz spectrum and its appeal as a

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[34] Comments of Intel Corporation, Inc. at 7.

[35] Comments of Motorola, Inc. at 2.

[36] Comments of APCO at 2-3.

[37] AT&T Wireless has proposed, moreover, reallocating the unassigned commercial spectrum in the upper 700 MHz band to public safety, and relocating 800 MHz public safety licensees to the 700 MHz band, as a means to address the interference concerns in the 800 MHz band. *See, e.g.*, Reply Comments of ALLTEL Communications, Inc., AT&T Wireless Services, Inc., Cingular Wireless LLC, Coupe Communications, Inc., First Cellular, Nokia Inc., Southern LINC, and United States Cellular Corporation to the *Notice of Proposed Rulemaking* in WT Docket No. 02-55, at 15-18 (filed Aug. 7, 2002). *See also* Comments of Cingular Wireless LLC at 11.

spectrum band for mobile operations.[38] As the Rural 700 MHz Band Licensees noted, "unlicensed operations should not be permitted on channels 52-69 . . ., on any other spectrum bands that have been licensed by or designated for auction, or where incumbent licensees have been granted exclusive use rights."[39]

2. 3650-3700 MHz

As noted above, AT&T Wireless believes that the Commission should identify spectrum that can be dedicated for unlicensed use. Although the 3650-3700 MHz band would not be completely dedicated for such uses, AT&T Wireless, like many commenters, believes that this band offers possibilities for unlicensed operations.[40] We remain concerned, however, about the interference issues that incumbent licensees have raised.[41]

The unique characteristics of the 3650-3700 MHz band make it worthwhile to consider whether unlicensed operations can be allowed. As an initial matter, this spectrum band is licensed for fixed operations, thereby offering some possibility that unlicensed devices can operate in unused portions of the band without causing interference to licensees. In addition, the band is not heavily encumbered. Nonetheless, the Satellite Industry Association raised serious questions as to whether unlicensed operations can co-exist consistent with satellite operations. AT&T Wireless suggests that the Commission investigate the interference threat – and interference avoidance technology – before initiating a rulemaking on this band.

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[38] *See* Comments of Data Flow Systems, Inc. at 5 ("[T]he value of spectrum at auction also may be significantly impacted by a decision to permit the unregulated (i.e., unlicensed) utilization of spectrum being considered for auction.").

[39] Comments of the Rural 700 MHz Band Licensees at 6.

[40] *See, e.g.* Joint Comments of Intersil Corporation and Symbol Technologies, Inc. at 5; Comments of Cingular Wireless LLC at 10.

[41] *See* Comments of the Satellite Industry Association at 3.

III. THE COMMISSION SHOULD PROCEED WITH AN IN-DEPTH STUDY OF THE NOISE AND INTERFERENCE ENVIRONMENT – NOT THE LAUNCH OF AN UNLICENSED NPRM.

The comments submitted in response to the *NOI* do not provide real-world evidence that technological solutions can protect licensees from interference that would be caused by the introduction of unlicensed operations in spectrum below 900 MHz or in the 3650-3700 MHz band. Nonetheless, some parties urge the Commission to move expeditiously to an NPRM to open the subject bands to new unlicensed operations.[42] The Software Defined Radio Forum, for example, asserts that notices of inquiry are "broad but shallow" and suggests that if the Commission were to issue an NPRM, industry would "generate the necessary technical due diligence."[43] AT&T Wireless respectfully disagrees with this approach. As AT&T Wireless noted in response to the Spectrum Policy Task Force Report:

> Given the scarcity of unallocated spectrum, particularly below 5 GHz, it may be tempting to move quickly when presented with a new paradigm that promises innovative ways to introduce new entrants . . . . Unless the Commission does the proper groundwork, however, it risks embarking on an [unlicensed] policy premised on unrealistic theory, implausible modeling, and futuristic engineering.[44]

Launching a Commission rulemaking proceeding would be premature at this time.[45] Given the risk of interference to licensed services, unlicensed proponents must demonstrate their technologies' capabilities in order to justify an rulemaking; reliance on promises of future interference avoidance capability as the basis for an NPRM will place the Commission in the role of cheerleader rather than decisionmaker.[46] Cox Broadcasting suggested that the Commission require a series of milestones for

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[42] *See, e.g.*, Comments of the Software Defined Radio Forum at 7; Comments of the Wi-Fi Alliance at 2; Comments of Intel Corporation at 10.

[43] Comments of the Software Defined Radio Forum at 7.

[44] AT&T Wireless SPTF Comments at 9.

[45] *See* Comments of Shure Incorporated at 2.

[46] *See Separate Statement of Commissioner Kevin J. Martin, Approving in Part and Dissenting in Part, NOI*, 17 FCC Rcd. at 25648 (expressing reservations about opening an inquiry that "risks causing
(continued on next page)

testing and evaluating unlicensed operations and the interference environment prior to any further steps. While this approach may be overly structured, AT&T Wireless strongly favors Cox's perspective and asserts that, before pursuing an NPRM, the Commission must have sufficient information "to evaluate a proof of concept rather than guess about the sufficiency of efforts to prevent harmful interference."[47]

As noted above, before the Commission considers additional unlicensed use in licensed bands, it must develop a more thorough understanding of the radiocommunications environment and, based on that information, assess the possibility for sharing between unlicensed devices and licensed services, including what constitutes "white space." As Cingular Wireless noted, the Commission's Technological Advisory Council ("TAC") "recognized that the Commission cannot engage in effective spectrum management until it 'develop[s] a more complete understanding of the current state of the radio noise environment.'"[48] The Commission's next spectrum policy initiative should be an inquiry into the noise and interference environment. Such action is a necessary prerequisite to any consideration of spectrum efficiency or improved access to spectrum. Consistent with its comments in response to the Spectrum Policy Task Force Report, AT&T Wireless suggests that the Commission open a comprehensive inquiry that explores the following issues, among others:

- how the noise floor varies from environment to environment, and how it is expected to evolve (Cingular Wireless's comments note that with the advent of digital offerings, the noise floor at base station receive sites has actually *decreased*[49]);
- the various sources and forms of interference, including out-of-band emissions, spurious emissions, intentional emissions from Part 15 devices, and ambient noise;
- factors affecting the impact of interference on licensees, including degradation of quality, loss of capacity, and decreases in coverage;

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significant uncertainty, as licensees must consider the potential for additional interference as well as a new class of users with expectations for spectrum in these already crowded bands.").

[47] Comments of Cox Broadcasting, Inc. at 8-9.

[48] Comments of Cingular Wireless LLC at 6 (quoting FCC TAC, Second Meeting Report at 1, 9 (Oct. 28, 1999).

[49] *See* Comments of Cingular Wireless LLC at 8.

- the impact of interference on wireless system design, including effects on cell size, power levels, and handset capabilities;
- how increased levels of interference could affect future innovation and the use of spectrum-efficient technologies by existing licensees;
- the effectiveness of the Commission's current interference management regime; and
- looking ahead, how the Commission can ensure and enforce interference protection rights – the linchpin of a market-oriented spectrum policy – in today's increasingly complex spectrum environment.[50]

CONCLUSION

For the reasons discussed above, AT&T Wireless respectfully submits that the Commission must act deliberately as it considers the introduction of new unlicensed sharing techniques. Under no circumstance should the Commission consider introducing such operations into spectrum licensed for mobile services. The Commission should launch a proceeding to investigate the noise floor and interference environment before any further consideration of new unlicensed regulatory regimes.

Respectfully submitted,

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[50] AT&T Wireless SPTF Comments at 13.