

**Before the  
Federal Communications Commission  
Washington, DC 20554**

In the Matter of )  
 )  
Commission Seeks Public Comment on Spectrum ) ET Docket No. 02-135  
Policy Task Force Report )

**COMMENTS OF AT&T WIRELESS SERVICES, INC.**

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**COMMENTS OF AT&T WIRELESS SERVICES, INC.**

AT&T Wireless Services, Inc. (“AWS”) hereby responds to the Commission’s Public Notice seeking comment on the Spectrum Policy Task Force Report.<sup>1</sup>

**INTRODUCTION AND SUMMARY**

AWS commends the Spectrum Policy Task Force (“Task Force”) for this important Report.<sup>2</sup> It is an historic undertaking, providing the Commission and the nation with a framework to consider spectrum management policy for the 21<sup>st</sup> century.

In these comments, AWS supports the Task Force’s recommendations to continue the transition to more market-oriented spectrum policies and primarily to apply the exclusive use model in spectrum below 5 GHz. Market forces alone, however, cannot substitute for sound spectrum management policymaking and oversight. Thus, the Commission should incorporate market-oriented policies into an overall spectrum management plan that provides sufficient regulatory certainty for users to invest the billions of dollars necessary to acquire spectrum and build out networks that promise innovative, exciting services to American consumers. As part of the transition to more market-oriented spectrum usage

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<sup>1</sup> Public Notice, *Commission Seeks Public Comment on Spectrum Policy Task Force Report*, ET Docket No. 02-135, FCC 02-322 (rel. Nov. 25, 2002); *see also Commission Seeks Public Comment on Spectrum Policy Task Force Report*, ET Docket No. 02-135, Order, DA 02-3400 (rel. Dec. 11, 2002) (extending comment and reply comment dates).

<sup>2</sup> Spectrum Policy Task Force, ET Docket No. 02-135, Report (rel. Nov. 15, 2002) (“*Report*”).

models, the Commission should grant flexible use rights prospectively using market-oriented assignment mechanisms only, thus ensuring that these rights are awarded to those who will put them to their highest and best use.

AWS also believes the Task Force's significant emphasis on interference management is well-timed given the increasing complexities of the spectrum environment. Interference protection is a critical component of building a robust spectrum-based service. Before embracing any new policy formulas, however, the Commission should engage in an in-depth study of the noise and interference environment. In particular, it needs to investigate real world engineering issues before it can assess the potential consequences of the Report's proposed paradigm – the interference temperature concept. Further, the Commission should make clear that it will not introduce underlays or easements into spectrum already licensed under the exclusive use, flexible rights regime. Such operations would undermine the benefits of exclusive licenses and restrict rights already granted by degrading network quality and limiting opportunities for innovative, spectrum-efficient systems. Instead, the Commission should improve access to spectrum by adopting the secondary markets initiative.

Finally, AWS encourages the Commission to consider allocation policy as part of an overall spectrum management plan that takes into account international harmonization, interference protection and other policies mandated by Section 303(y).

**I. THE COMMISSION SHOULD CONTINUE THE TRANSITION TO MORE MARKET-ORIENTED SPECTRUM POLICIES AS PART OF A BROAD SPECTRUM MANAGEMENT PLAN.**

AWS commends the Task Force for encouraging the Commission to continue the evolution from “command-and-control” spectrum management to more market-oriented policies.<sup>3</sup> The experiences of AWS and others providing services under the cellular and PCS rules confirm that a regulatory framework combining technical and service flexibility with defined spectrum rights is most likely to encourage

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<sup>3</sup> See *id.* at 36, 38-40.

spectrum to be put to its highest and best use. Market forces alone, however, cannot substitute for the exercise of sound spectrum management. The Commission must engage in active spectrum management that provides the regulatory certainty needed to encourage investment and innovation in spectrum-based services.<sup>4</sup>

**A. The Commission Should Adopt The Exclusive Use Model In Spectrum Below 5 GHz.**

As the Report notes, the command-and-control model of spectrum management suppresses spectrum's true potential while more market-oriented models promise to unleash it. Inherent in the command-and-control model is an administrative prediction of the best use for spectrum, but the regulatory process cannot keep pace with technological advances and marketplace demands. Although there may be some instances that suggest command-and-control regulation (*e.g.*, public safety communications), AWS agrees with the Task Force's recommendation that such instances should be minimized to the greatest extent possible.<sup>5</sup>

AWS concurs with the Report's conclusion that the Commission should move towards the exclusive use and commons models and strike an "appropriate balance" between the two.<sup>6</sup> AWS supports the recommendation that the Commission primarily adopt the exclusive use model in spectrum below 5 GHz because that spectrum is subject to significant competing demands and therefore is more likely to have a high market value.<sup>7</sup> AWS also favors some use of the commons model, provided that such an

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<sup>4</sup> AWS discussed the Commission's responsibility for setting out an appropriate spectrum management framework in great detail as part of its comments in response to the Spectrum Policy Task Force's Public Notice last summer. *See Ex Parte Comments of AT&T Wireless Services, Inc.*, ET Docket No. 02-135 (filed July 12, 2002).

<sup>5</sup> *See Report* at 41.

<sup>6</sup> *Id.* at 38.

<sup>7</sup> *See id.*

approach is introduced into spectrum dedicated for unlicensed use, primarily in higher spectrum bands and “particularly above 50 GHz.”<sup>8</sup>

As the Report notes, the PCS rules largely embody the exclusive use model,<sup>9</sup> which has helped to foster a vibrant and highly competitive mobile communications industry. Provided with exclusive use, technical and service flexibility, and defined spectrum rights, the wireless industry has invested billions of dollars in network deployment and wireless subscribership has grown beyond anyone’s expectations.<sup>10</sup> Moreover, this flexibility, which has been applied broadly to commercial mobile radio services (“CMRS”), has helped carriers to efficiently migrate from analog to 2G, 2G to 2.5G, and as an interim measure until additional spectrum is available for 3G, from 2.5G to 3G.<sup>11</sup> Based on its own experiences, AWS sets forth below the key elements of this model: genuine exclusive use; clearly defined spectrum rights, including sufficient interference protection; and technical and service flexibility.

It is important to note the critical role that exclusive use plays in promoting investment. First, the exclusive use model creates an environment that is favorable for capital formation – a necessity given the extensive capital requirements of wireless communications networks such as CMRS systems. As one economist explained, “Investors are willing to pay substantial amounts to avoid the spectrum commons. . . . Financial markets see huge advantages to being able to optimize the use of bandwidth by excluding non-payers.”<sup>12</sup> Second, exclusivity encourages licensees to invest in network infrastructure and

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<sup>8</sup> *Id.* at 39.

<sup>9</sup> *See id.* at 46; Report of the Spectrum Rights and Responsibilities Working Group at 12-13, 27 (rel. Nov. 15, 2002).

<sup>10</sup> The Report notes that in 1994, the Commission allocated spectrum to mobile wireless services based on the projection of 54 million subscribers for the year 2000, although there were approximately 110 million subscribers by the year 2000. *See Report* at 12.

<sup>11</sup> AWS notes, however, that new technologies with increased spectrum efficiency cannot satisfy the growing demands for CMRS spectrum.

<sup>12</sup> Thomas W. Hazlett, *The Wireless Craze, The Unlimited Bandwidth Myth, The Spectrum Auction Faux Pas, and the Punchline to Ronald Coase’s ‘Big Joke’ – An Essay on Airwave Allocation Policy*, AEI- (continued on next page)

creates incentives for innovation and efficiency, thus advancing one of the principal goals of spectrum management: rapid development and deployment of new and innovative, spectrum-efficient services.

Conversely, the introduction of underlay operations and/or easements would undermine the market-oriented spectrum policy goals the Report seeks to promote, especially if applied in spectrum already licensed under the exclusive use model. Disrupting the exclusive use model would degrade network quality and threaten carriers' ability to access debt and equity markets. 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.

AWS agrees that "the Commission must clearly define the . . . basic spectrum rights parameters" for licensed spectrum users.<sup>13</sup> As the Report concludes, these parameters include: (i) designated frequency range and bandwidth; (ii) geographic scope of right to operate; (iii) maximum RF output, both in-band and out-of-band; and (iv) interference protection.<sup>14</sup> As discussed further in Part II below, the right to sufficient interference protection is a critical component of exclusive use. It requires renewed and dedicated Commission focus on the legal, technical and economic consequences of poorly defined interference protection. In addition to those parameters listed above, the bundle of rights associated with a spectrum license should include a strong renewal expectancy.<sup>15</sup>

Finally, while AWS generally supports the key elements of flexibility identified in the Report – choice of uses or services, choice of technology, and the right to transfer, lease or subdivide spectrum

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Brookings Joint Ctr. for Regulatory Studies, Working Paper 01-01 (Jan. 2001) at 134, *reprinted at* 14 Harv. J. Law & Technology 535 (2001).

<sup>13</sup> *Report* at 18. AWS agrees that clearly defined parameters of operation should apply to unlicensed users as well. *See id.*

<sup>14</sup> *See id.* at 18.

<sup>15</sup> *See id.* at 23, 64.

rights<sup>16</sup> – a flexible use policy should not be unbounded. The Commission should only grant flexibility in the context of spectrum management allocation and assignment decision making and not as a means to prop up individual companies or industries. Otherwise, the Commission risks distorting the marketplace.<sup>17</sup>

**B. The Commission Should Provide Market-Oriented Spectrum Usage Rights Prospectively By Fair And Efficient Means.**

In considering how to introduce more market-oriented spectrum usage models, the Report identifies four approaches to transition out of the command-and-control model.<sup>18</sup> AWS believes that the Commission should embrace the common principle in the first three options – any grant of substantial, expanded rights must be issued as part of new initial licenses. Thus, the Commission should only grant flexible use rights prospectively through market-oriented assignment mechanisms that avoid the provision of unfair and unlawful “windfalls and unjust enrichment.”<sup>19</sup>

**1. Prospective Grants Encourage The Highest And Best Use of Spectrum.**

In granting additional spectrum rights, the Commission is governed by its statutory obligations. Section 309(j) mandates, in virtually all instances, that the spectrum be licensed via competitive bidding.<sup>20</sup> AWS notes that today, the ORBIT Act auction exemption applies to international and global satellite use

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<sup>16</sup> *See id.* at 17.

<sup>17</sup> *See* Part I.B. *infra*.

<sup>18</sup> The four options are: (1) reallocating a particular band to the flexible rights model, with assignment of the expanded rights to new licensees and the mandatory relocation of incumbents to other bands; (2) allowing incumbents to remain as licensees for those portions in a band that they currently occupy, while assigning “overlay” licenses for additional rights and/or unoccupied “white space” not assigned to incumbents; (3) reallocating and assigning spectrum to new licensees under the flexible rights model, and using voluntary market-based band-restructuring incentives, such as a two-sided auction, to encourage incumbents to clear or restructure the band; or (4) granting expanded, flexible rights to the incumbent licensees already occupying the band. *See Report* at 47-49.

<sup>19</sup> *Id.* at 51.

<sup>20</sup> 47 U.S.C. § 309(j).

only; it does not apply to terrestrial use rights in the same spectrum.<sup>21</sup> To eliminate marketplace distortions in the assignment of spectrum, however, AWS supports the Report's recommendation that the Commission ask Congress to modify the ORBIT Act to permit the use of auctions to resolve mutually exclusive applications for global and international satellite services.<sup>22</sup>

As a policy matter, assigning flexible use rights prospectively – after clearly identifying the service and technical flexibility parameters – fosters a robust spectrum marketplace. In this way, the Commission's competitive bidding and service rules will facilitate market-driven assignments as potential bidders at auction, as well as the capital markets, can factor these rights into spectrum valuations and business plans. The flexible rights will then be awarded to those licensees best able to put the spectrum to its highest use – as was Congress's and the Commission's intent.

## **2. Retroactive Flexibility Distorts The Marketplace.**

In contrast, AWS urges the Commission to avoid grant of additional rights to incumbent licensees, which only results in “windfalls and unjust enrichment” and disrupts the Task Force's ultimate goal of a truly market-oriented spectrum policy.<sup>23</sup> The Commission's market-oriented spectrum usage

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<sup>21</sup> See *Amendment of the Commission's Rules to Authorize Subsidiary Terrestrial Use of the 12.2-12.7 GHz Band by Direct Broadcast Satellite Licensees and Their Affiliates*, Memorandum Opinion and Order and Second Report and Order, 17 FCC Rcd 9614, 9705-9708 ¶¶ 238-45 (2002). Indeed, Senator John McCain recently observed that any terrestrial use rights in satellite spectrum “must be auctioned” given the Commission's previous interpretation of Section 309(j). Letter from the Honorable John McCain, U.S. Senate Committee on Commerce, Science, and Transportation to the Honorable Michael K. Powell, Chairman, FCC (Dec. 20, 2002). See also Letter from the Honorable John Ensign, U.S. Senate Committee on Commerce, Science, and Transportation to the Honorable Michael K. Powell, Chairman, FCC (Jan. 24, 2003) (“While the [ORBIT] Act prohibits the Commission from auctioning spectrum used for satellite service, it does not prohibit auctioning spectrum when used to provide domestic terrestrial wireless service.”).

<sup>22</sup> See *Report* at 42.

<sup>23</sup> This position is consistent with the Commission's decision to authorize CMRS providers to offer mobile and fixed services. It should be noted that at the time initial cellular licenses were awarded in 1982, the Commission's practice was to approve requests of Part 22 licensees “to use their frequencies and facilities to provide ‘incidental’ communications service,” including fixed services. *Revision and Update of Part 22 of the Public Mobile Radio Services Rules*, Report and Order, 95 FCC2d 769, 816 ¶ 167 (1983). See also 47 C.F.R. § 22.308 (1994) (providing for incidental service which allowed for fixed service). And as early as 1994, the Commission noted the wide range of permissible uses of PCS (continued on next page)

policy should not be used as a means to accomplish private reallocations that prop up failed businesses or services. If presented with an incumbent's request for flexibility to deploy an entirely different service than the originally licensed service, the Commission should not substitute its judgment for that of the market by granting such a request.<sup>24</sup> Instead, it should exercise its spectrum management authority to determine whether the spectrum is being underutilized.<sup>25</sup> If so, the Commission should reallocate the spectrum and, if exclusive use is deemed the appropriate spectrum usage model, license the spectrum via competitive bidding.

In sum, AWS commends the Task Force's recommendation to transition to more market-oriented spectrum usage models and supports adoption of the exclusive use model in spectrum below 5 GHz. AWS encourages the Commission, however, to incorporate these policies into an overall spectrum management plan that recognizes appropriate limitations on flexible spectrum use.

## **II. THE COMMISSION SHOULD PROCEED WITH AN IN-DEPTH STUDY OF THE INTERFERENCE ENVIRONMENT – NOT THE LAUNCH OF THE INTERFERENCE TEMPERATURE CONCEPT.**

Interference protection has always presented challenges, but as the Report notes, interference management issues today are “increasing in technical difficulty and prevalence.”<sup>26</sup> The growing complexities are largely due to the more intensive use of the spectrum, the greater density, mobility and variability of RF emitters, and the increased flexibility granted to spectrum users. The Report

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spectrum, including fixed services. See Letter from Regina M. Keeney, Chief, Wireless Telecommunications Task Force, FCC to A. Thomas Carroccio, Esq. (Nov. 15, 1994). Cellular and broadband PCS licensees were initially authorized to provide fixed services under their licenses without additional Commission approval. The 1996 *CMRS Flex* decision merely eliminated the ancillary/incidental limits on the provision of such service. *Amendment of the Commission's Rules to Permit Flexible Service Offerings in the Commercial Mobile Radio Services*, WT Docket No. 96-6, First Report and Order and Further Notice of Proposed Rulemaking, 11 FCC Rcd 8965 (1996). This rule modification cannot be considered tantamount to the grant of retroactive flexibility.

<sup>24</sup> A grant of retroactive flexibility would implicitly presuppose that the current licensees are best able to exercise flexible use rights. There is no basis to make such a judgment.

<sup>25</sup> See CTIA Comments, ET Docket No. 02-135, at 8-9 (filed July 8, 2002).

<sup>26</sup> *Report* at 25.

appropriately reiterates the bedrock principle that “sufficient interference protection is a necessary and fundamental building block in any spectrum policy.”<sup>27</sup> AWS commends the Task Force for placing significant emphasis on interference management, but AWS has serious misgivings about the “solution” the Report proposes: adoption of the “interference temperature” concept and imposition of an interference “cap” with unlicensed devices operating below the cap.

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 while claiming to bolster interference protection at the same time. Unless the Commission does the proper groundwork, however, it risks embarking on an “underlay” policy premised on unrealistic theory, implausible modeling, and futuristic engineering. AWS urges the Commission to refrain from hasty adoption of the interference temperature concept and instead initiate a more comprehensive study of the spectrum environment so as to better inform its decision making.

**A. The Commission Should Withhold Support For The Interference Temperature Concept Until Significant Questions Can Be Answered.**

In order to better manage and control interference, the Report endorses an interference temperature concept that would establish an upper limit on the amount of permissible interference licensees would have to tolerate in a particular spectrum band. The Report declares that, with an interference temperature metric in place, technological developments will enable new users and devices to access the spectrum below the interference cap “without detriment to existing spectrum users.”<sup>28</sup> Yet significant questions exist regarding whether the interference temperature concept can offer sufficient interference protection to licensed users. Indeed, as the Task Force itself acknowledges, “there are significant hurdles that must be overcome” before the interference temperature concept might be

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<sup>27</sup> *Id.*

<sup>28</sup> *Id.* at 15.

considered a “useful management tool.”<sup>29</sup> The Commission should take the time to fully understand these hurdles.

The Report nonetheless encourages the Commission to pursue the interference temperature concept, which it claims will “increase access to the band for other users and devices.”<sup>30</sup> This recommendation presumes – without substantiation – that technology will protect the provision of existing services: “smart technologies, such as software-defined radios,” will enable new users or devices to operate in licensed spectrum “without detriment to existing spectrum users.”<sup>31</sup> The Report envisions that an underlay device with “self-enforcing sensory control mechanisms” will gauge the local spectrum environment and determine whether it can operate without increasing the level of interference beyond the cap.<sup>32</sup> Yet, as the Report acknowledges, any assessment of current or likely levels of interference is extremely difficult because the universe of interference sources “may not be known or anticipated.”<sup>33</sup>

The interference temperature metric raises substantial concerns even as it purports to provide greater interference protection certainty. The Report suggests that the Commission could set interference temperatures by taking measurements “at various receiver locations to estimate the real-time condition of the RF environment,” and that an interference temperature cap could be set “for each band, geographic region or service.”<sup>34</sup> This approach, however, is overly simplistic, as it ignores the reality that interference environments are *extremely* localized and dynamic, and variations are not dependent solely on spectrum band, geographic area, service and technology. The impact of interfering signals is highly

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<sup>29</sup> *Id.* at 33.

<sup>30</sup> *Id.* at 30.

<sup>31</sup> *Id.* at 15; *see also id.* at 32 (“In the future, it is expected that, to a considerable extent, interference problems will be eliminated or adequately mitigated by flexible software solutions built into the receiver, for example, software-controlled filter responses.”).

<sup>32</sup> *Id.* at 33.

<sup>33</sup> *Id.* at 18.

<sup>34</sup> *Id.* at 28.

dependent on the distance and the spatial relationship between the interfering transmitter and the victim receiver, and on the nature of the transmission with which it might potentially interfere. The interference environment in an office building, for example, substantially differs from the environment in a courtyard just outside. The quality of AM radio reception, moreover, can turn from clear to unintelligible in just a few feet. Statistical modeling can only provide rough approximations that do not fairly account for the variability in local interference environments.<sup>35</sup> In addition, in coverage-limited areas where systems operate at or near the noise floor (*e.g.*, in-building or tunnel operations), imposition of an interference temperature cap and underlay operations would by definition reduce network coverage and degrade service – thereby causing harmful interference to existing licensees’ operations.<sup>36</sup> It is, therefore, extremely doubtful that the Commission could identify an interference temperature cap that fully accounts for protection of existing services as it seeks to promote underlay operations.

Putting aside the obstacles to setting a reasonable interference temperature cap, the Report envisions that a potentially interfering transmitter – using technologies that can only be described as futuristic – will be able to judge its immediate interference environment to determine whether it can operate below the interference cap. This approach, however, assumes a level of technical sophistication that is not expected to exist in a commercial setting for years, if not decades.<sup>37</sup> Such an approach, moreover, is complicated by the existence of so-called “hidden transmitters” whose energy may not be detectable by a potentially interfering transmitter at a specific point in time, but whose transmissions would contribute to the degradation of the licensed system if the interfering transmitter were to begin transmitting. Without further analysis of the scope of the RF environment, substantial questions exist as

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<sup>35</sup> Moreover, any measurement of the interference temperature would need to exclude “self-interference” generated the licensee itself, because in some cases receiver processing can remove self-interference even though it cannot remove unknown interference.

<sup>36</sup> The Report itself acknowledges that coverage areas will shrink. *Cf.* Figs. 2 & 3, *Report* at 29.

<sup>37</sup> *See, e.g.*, Nokia, Inc. Comments, ET Docket No. 00-47, at 6-8 (filed June 14, 2000).

to whether the Commission will be able to adopt interference temperature metrics that have any realistic chance of ensuring against harmful interference to existing services and customers.

The interference temperature underlay not only imperils the interference protection principle, but it also undermines market-oriented spectrum policy which depends on clearly defined spectrum rights, including the right to interference protection. While the Report notes that effective enforcement is “an essential component” necessary for interference temperature-enabled underlay operations, it proposes no recommendations to address the futility licensees experience today in pursuit of interfering devices that are itinerant, unlicensed, and unidentifiable. As the Report even acknowledges, once devices are introduced into the marketplace, “it may be difficult legally or politically to shut down their operations *even if they begin to cause interference or otherwise limit the licensed user’s flexibility.*”<sup>38</sup> Time and again, the Commission’s well-intentioned spectrum policies have led to this precise result.<sup>39</sup>

The interference temperature concept places complete faith in the Commission’s ability to set permissible levels of increased interference for all interference environments and declares that futuristic unlicensed devices will be able to gauge the interference temperature and only operate below the cap. There is no basis to conclude that this approach is practical, technically feasible in any meaningful timeframe, or enforceable. The Commission, therefore, should withhold support from the interference temperature concept.

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<sup>38</sup> *Report* at 58 (emphasis added).

<sup>39</sup> This past summer, for example, the Commission found that certain existing radar detectors were causing harmful interference to very small aperture satellite terminals (VSATs) in the 11.7-12.2 GHz band. The Commission imposed radiated emission limits on newly marketed radar detectors but did not take any steps to protect VSATs from interfering detectors already in the marketplace. As the decision noted, “identifying [these] radar detectors is not practical . . . because these devices are mobile and therefore interfere intermittently. Further . . . in most cases it is not possible for the [victim operator] to remedy the interference even if the source could be identified” because these devices are not controlled by the victim operator. *Review of Part 15 and Other Parts of the Commission’s Rules*, First Report and Order, 17 FCC Rcd 14063, 14067 ¶ 11 (2002).

**B. The Commission Should Study The Interference Environment More Thoroughly.**

AWS urges the Commission to avoid becoming enmeshed in support for the interference temperature concept and instead initiate a comprehensive inquiry into interference in today's spectrum environment. AWS cautions the Commission to avoid another ultra-wideband scenario in which policies were embraced before adequate testing with real world devices was conducted. "Blackboard engineering" is a necessary, but not sufficient, step in addressing interference concerns. Rather, the Commission should engage in a comprehensive inquiry that explores the following issues, among others:

- noise floor variations from environment to environment, and how the noise floor is expected to evolve;
- 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 decrease in coverage;
- the impact of interference on system design including 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.

As a first step in gaining a greater understanding of the interference environment, the Commission should take up the Report's recommendation to conduct a study of the noise floor.<sup>40</sup>

Although the TAC last year commissioned a literature review of existing noise floor-related publications and studies, the Commission must make a meaningful commitment to a noise floor study to gain a firm understanding of the current interference environment. AWS supports the Report's recommendation that

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<sup>40</sup> For several years, the Commission's Technological Advisory Council ("TAC") has called on the Commission to "develop a more complete understanding [of] the current state of the radio noise environment." See FCC Technological Advisory Council, Second Meeting Report at 1 (rel. Oct. 28, 1999).

any review of the noise floor include both public and private sector participation. At this time, this is the only responsible course of action.

**III. THE COMMISSION SHOULD DECREE THAT NEITHER UNDERLAY OPERATIONS NOR OPPORTUNISTIC EASEMENTS WILL BE INTRODUCED INTO CURRENTLY LICENSED EXCLUSIVE USE, FLEXIBLE RIGHTS SPECTRUM.**

As noted above, CMRS providers, as well as others, have acquired exclusive use rights and, based on those rights, have built out multi-billion dollar networks that provide innovative services using the most efficient technology available. The Report asserts, however, that the degree of flexibility afforded to particular spectrum users should take into account “the importance of promoting reasonable access to spectrum for other potential users.”<sup>41</sup> This statement could be read to suggest that the Commission might consider reclaiming previously granted flexible use rights in order to introduce new users into exclusive use spectrum. The Commission must recognize that introducing underlays or opportunistic easements into bands in which flexible use rights already exist would not only increase interference levels but would restrict the very flexibility that was granted as part of the existing exclusive use license. Such underlays or easements could jeopardize existing services and severely devalue the assets of existing licensees. The Commission should clarify that it does not intend to take any such action.

The final passage in the Report acknowledges the tension between exclusive use licenses already granted and the Task Force’s desire to promote access to spectrum by new users. The Report states that the Commission “cannot, and should not,” make any changes involving access to currently occupied spectrum “without giving serious consideration to the reliance interests of incumbent spectrum users.”<sup>42</sup> AWS agrees with and supports the Task Force’s recommendation that the Commission “[a]ddress

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<sup>41</sup> *Report* at 16.

<sup>42</sup> *Id.* at 61.

underlay/easement rights in transition bands on a going-forward basis (avoid retroactive easements).”<sup>43</sup>

Where the Commission has already granted exclusive use licenses, it should not undermine these licensees’ rights by introducing underlays and easements. If the exclusive use model is to mean anything, it must allow spectrum users to adjust their networks and services to meet marketplace demands. If, after a comprehensive review of interference mechanisms, the Commission wishes to consider underlays or opportunistic easements, it should apply these concepts only in spectrum bands that are being reallocated and transitioned to more market-oriented models – and not in bands with existing exclusive use licensees.

#### **A. Underlay Operations**

In addition to the concerns expressed above in Part II about rushing to set interference temperatures, AWS urges the Commission to recognize the unacceptable costs of allowing any underlay operations on spectrum already licensed under the exclusive use model. Allowing underlay operations in already-licensed spectrum would cause existing licensees to suffer degradation of network coverage, lower service quality, loss of flexibility, and decreased ability to introduce innovative, more efficient systems.<sup>44</sup> When these costs are considered, it is clear that any future consideration of such operations should be limited to reallocated spectrum that is being transitioned to more market-oriented models.

Today, licensees with exclusive use rights often design their network operations to extend to the edge of the noise floor. Many CMRS carriers relied on this exclusive right – and the existing noise floor – as the basis for multi-billion dollar investments in network infrastructure. By definition, the interference temperature concept would effectively eliminate these licensees’ rights to operate between the noise floor and the interference temperature cap. An interference temperature metric would result in real world disruption in network coverage, forcing carriers to divert capital from coverage improvements

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<sup>43</sup> *Id.* at 53.

<sup>44</sup> Many spectrum users, including AWS, have opposed underlay operations concept in the ultra-wideband (“UWB”) context. *See, e.g.*, Comments of AT&T Wireless Services, Inc. on Petitions for Reconsideration, ET Docket No. 98-153 (filed July 31, 2002).

and new technology deployment to capacity upgrades.<sup>45</sup> Licensees granted exclusive use and interference protection rights should not be forced to mitigate interference from new operators or devices in their assigned spectrum.

As envisioned in the Report, moreover, the benefits of the interference temperature model accrue disproportionately to underlay users. The interference temperature concept would limit incumbent licensees' future network design flexibility, as well as their ability to introduce more efficient technologies and systems. While the Report suggests that the Commission conduct a periodic review "to prevent rules that are calibrated to older technologies from inhibiting access by newer, more efficient technologies,"<sup>46</sup> it leaves unclear how the interference temperature cap would be revised to enable an incumbent licensee to introduce a new, more efficient use of its licensed spectrum that would need to operate below the interference temperature cap.

Many licensees who acquired spectrum at auction based their winning bids in large part on the grant of exclusive use and a stable interference environment. Upsetting these expectations not only disservices these licensees but also undermines the integrity of the auction process going forward. If the Commission seeks to explore the interference temperature concept further, it should take the earliest opportunity to clarify that it will not impose the metric – and the associated losses – in spectrum already licensed under the exclusive use, flexible rights model. A Commission pronouncement to that effect would eliminate significant uncertainty currently in the marketplace.

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<sup>45</sup> For example, AWS estimated that UWB underlay operations in a given PCS cell could decrease coverage by approximately 8-9 percent. *See* Comments of AT&T Wireless Services, Inc. on Petitions for Reconsideration, ET Docket No. 98-153, at 7-8. This estimate assumes 1 dB degradation in basestation receiver sensitivity caused by interference from UWB devices.

<sup>46</sup> *Report* at 22.

## **B. Opportunistic Easements**

AWS has grave doubts about the wisdom, and even the legality, of the Report's suggestion that the Commission consider "possibly . . . some limited use" of opportunistic easements at a later date.<sup>47</sup> AWS commends the caution in this statement. The technology for a time-hopping device to jump in and out of licensed spectrum simply does not exist. The significant legal, policy, and enforcement issues involved should lead the Commission to refrain from even beginning to entertain earnest consideration of the concept.

As a legal matter, opportunistic intrusions into spectrum licensed on an exclusive use model could result in a regulatory taking<sup>48</sup> or, in the case of spectrum licensed at auction, could subject the government to damages for breach of contract.<sup>49</sup> As a policy matter, opportunistic easements would create substantial uncertainty regarding licensees' exclusive use and interference protection rights, and is completely contrary to the Commission's goal of promoting a more market-based exclusive use regime.<sup>50</sup> An opportunistic easement regime that includes "self-enforcing" control methods would raise significant enforcement concerns, especially if easements were to be used by devices that would be unlicensed and untraceable. Further, it presents the real danger that easement users would be extremely difficult to dislodge – another example of the "squatter's rights" dilemma. If implemented, this scenario would surely upset investment-backed expectations, limit licensed providers' incentives to innovate and deploy more efficient technologies, and deter future investment.

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<sup>47</sup> *Id.* at 56.

<sup>48</sup> *See Penn Central Transp. Co. v. New York City*, 438 U.S. 104, 124 (1978) (articulating test for whether regulatory action constitutes a regulatory taking).

<sup>49</sup> *See Ex Parte Comments of AT&T Wireless Services, Inc.*, ET Docket No. 02-135, at 15 (filed July 12, 2002) (citing *Comments of Sprint Corporation*, ET Docket No. 02-135, at 10-11 (filed July 8, 2002)).

<sup>50</sup> The Report itself recognizes that the easement model "inherently limits the flexibility" granted licensees. *Report* at 58.

The Report wisely recommends that the Commission defer any consideration of opportunistic easements. AWS encourages the Commission to signal that such easements are not favored. Instead, to increase access to spectrum, the Commission should complete its rule making proceeding on secondary markets, as discussed below.

#### **IV. THE COMMISSION SHOULD IMPROVE ACCESS TO SPECTRUM BY COMPLETING THE SECONDARY MARKETS PROCEEDING.**

AWS believes that, rather than imposing new regulatory regimes that threaten to degrade existing wireless services, the Commission can best improve access to underutilized spectrum by enabling licensees to more freely engage in marketplace transactions that will allow spectrum to flow to its highest valued use. AWS therefore agrees with the Task Force's recommendation that the Commission promptly complete the secondary markets proceeding.<sup>51</sup> As AWS has noted previously, the Commission should adopt a secondary markets policy "that will provide the greatest flexibility for spectrum leasing arrangements, and thus spur their use."<sup>52</sup> To that end, AWS would support legislation if necessary.<sup>53</sup> A well-functioning secondary market, moreover, is achievable. As the Report observes, "licensees have economic incentives to use spectrum in ways that will yield the highest return to them," and they generally will grant others access to unused portions of their spectrum "if they are adequately compensated."<sup>54</sup>

AWS is troubled, however, by the broad discussion in the Report suggesting that secondary market transactions could provide for unconstrained opportunistic use of a licensee's spectrum. While AWS continues to believe that the opportunistic use model is technically unsound, if such operations were to become feasible one day, licensees should have the sole authority to decide whether to permit

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<sup>51</sup> *See id.* at 53, 57.

<sup>52</sup> Comments of AT&T Wireless Service, Inc., ET Docket No. 00-230, at 4 (filed Feb. 9, 2001).

<sup>53</sup> *See Report* at 57.

<sup>54</sup> *Id.*

such use on a purely voluntary basis and subject to appropriate contractual provisions. In that case, the licensee would retain total control over use of its licensed spectrum, thereby preserving its rights under the exclusive use license granted by the Commission.

The Report suggests that opportunistic use by individual devices could be allowed under a secondary markets agreement, “which can be negotiated directly with the licensee.”<sup>55</sup> Although the licensee would technically retain control over the use and operation of its licensed spectrum, as a practical matter the transaction costs associated with trying to negotiate opportunistic use with multiple unknown users and devices for fleeting moments of time are insurmountable. In particular, the computer power necessary to process such transactions would be enormous and beyond the reach of most licensees. Moreover, there is little basis to value such access on a microsecond basis. The underpinnings to such an arrangement can barely be conceived, and should certainly not be pursued by the Commission at this time.

## **V. THE COMMISSION SHOULD ENGAGE IN SOUND SPECTRUM MANAGEMENT TO FOSTER THE HIGHEST AND BEST USE OF SPECTRUM.**

As the Commission has noted on several occasions, “[s]pectrum management is one of the Commission’s core functions.”<sup>56</sup> This responsibility cannot be fulfilled by unfettered reliance on the free market or the promise of technological solutions. Different spectrum bands are better suited to different services, and radio frequencies and spectrum licenses are not fully fungible. An appropriate amount of flexibility can provide great benefits; too much flexibility can lead to market confusion and spectrum that lies fallow.<sup>57</sup> To address these issues, the Commission must provide a framework for the operation and evolution of radiocommunication services and ongoing management of the spectrum resource.

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<sup>55</sup> *Id.* at 56.

<sup>56</sup> Principles for Reallocation of Spectrum to Encourage the Development of Telecommunications Technologies for the New Millennium, Policy Statement, 14 FCC Rcd 19868, 19870 ¶ 6 (1999); Principles for Promoting the Efficient Use of Spectrum by Encouraging the Development of Secondary Markets, Policy Statement, 15 FCC Rcd 24178, 24185 ¶ 18 (2000).

<sup>57</sup> See Ex Parte Comments of AT&T Wireless Services, Inc., ET Docket No. 02-135, at 3-4.

**A. Flexible Allocations Are No Substitute For Sound Spectrum Management.**

Although flexible allocations can promote efficient spectrum use and encourage rapid deployment of innovative services, flexibility alone cannot substitute for Commission leadership and oversight in spectrum management. Congress concluded as much in adopting Section 303(y) of the Act, which requires the Commission to make certain affirmative findings before it grants a flexible allocation. In particular, Section 303(y) requires the Commission to find that a proposed flexible allocation is consistent with international agreements and, after notice and comment, that such an allocation would be in the public interest, would not deter investment, and would not result in harmful interference.<sup>58</sup>

The Report does not address how the Commission should approach its Section 303(y) obligations, although it contains some recommendations that deal with the subject matter of the relevant statutory criteria. Consistent with Section 303(y), the Commission should endorse and pursue the following concepts as it seeks to introduce greater flexibility into spectrum policy while balancing the need for regulatory certainty.

**1. International Harmonization**

AWS fully supports the Report's finding that "regional and worldwide harmonization of band use can have significant advantages both in terms of truly ubiquitous services and economies of scale."<sup>59</sup> As seen with 2G wireless services and, now with the recent allocation of spectrum for Advanced Wireless Services,<sup>60</sup> the disharmony between the U.S. allocations and other international allocations will continue to affect U.S. carriers' ability to offer international roaming services and will continue to lead to significant loss of economies of scale and scope in the handset marketplace. The costs of "tweaking" handset specifications for the U.S. market not only are passed through to consumers but they also delay

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<sup>58</sup> 47 U.S.C. § 303(y).

<sup>59</sup> *Report* at 42.

<sup>60</sup> *See Allocation of Spectrum Below 3 GHz for Mobile and Fixed Services to Support the Introduction of New Advanced Wireless Services*, ET Docket No. 02-353, Second Report and Order, FCC 02-304 (rel. Nov. 15, 2002).

the availability of new services and technologies, thus *undermining* an objective of the Commission's flexibility approach. As AWS has noted in relation to 2G service, because manufacturers focused on the larger, harmonized-band market first, it is estimated that U.S. consumers gained access to advanced features two years after the rest of the world.<sup>61</sup>

In sum, therefore, AWS encourages the Commission to strongly consider international harmonization as it engages in the allocation process.

## 2. "Good Neighbor" Policy

The Report recommends that the Commission consider "group[ing] technically compatible systems and devices in close spectrum proximity."<sup>62</sup> AWS strongly urges the Commission to do more than just consider a "good neighbor" policy – it should affirmatively pursue such a policy wherever possible.

The Commission has generally acknowledged the benefits of the good neighbor approach, and one case in particular underscores the cost of failing to place compatible systems near one another. In allocating spectrum for the Wireless Communications Service ("WCS"), the Commission was required by statute to reallocate the 2305-2320 and 2345-2360 MHz bands to wireless services, despite the fact that these bands are adjacent to bands that had been previously allocated for digital satellite radio broadcasting ("DARS").<sup>63</sup> Although the Commission provided flexibility in this prime spectrum band, its location adjacent to the higher-powered satellite DARS proved highly detrimental, as reflected in the limited interest in WCS licenses at the time of auction and in the limited roll-out of services since. The lesson is clear – flexibility *per se* may be useless if technical realities are not adequately considered in the allocation process.

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<sup>61</sup> See Ex Parte Comments of AT&T Wireless Services, Inc., ET Docket No. 02-135, at 19-20.

<sup>62</sup> Report at 22.

<sup>63</sup> See Section 3001 of the Omnibus Consolidated Appropriations Act, 1997, P.L. 104-208, 110 Stat. 3009 (1996).

The Report suggests that for existing services, a flexible use policy could create incentives for services to “migrate to compatible bands based on marketplace forces.”<sup>64</sup> This notion of naturally occurring marketplace groupings of like-services ignores the impact that such a migration would have on incumbent licensees. Higher-powered operations, for example, would inevitably cause harmful interference to their lower-powered neighbors. The world of spectrum management should not be governed by the law of the jungle – the Commission must retain sound spectrum management oversight.

### **3. Regulatory Certainty And Interference Protection**

By their nature, flexible service and technical rules can result in a higher level of unpredictability in the interference environment.<sup>65</sup> The Commission must continue to maintain sound, enforceable interference rules in a flexible use environment to provide manufacturers and licensees with the certainty necessary for long-term business planning. Absent meaningful interference parameters, the marketplace cannot function properly. The Report properly concludes that even in a flexible use regime, “clear technical rules (*e.g.* power limits, interference standards) remain necessary.”<sup>66</sup>

As an example, the PCS rules allow for different air interface protocols and technologies, which may result in different channelization and network configuration specifications. Relatively few PCS-PCS interference disputes have been brought to the Commission, however, largely because of the clear technical limits in the PCS rules. In addition, PCS licensees and their vendors have been able to achieve protocols and standards to avoid significant problems. And finally, PCS licensees have been able to resolve disputes not only because of clearly-defined rules and protocols, but because in an exclusive use

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<sup>64</sup> *Report* at 22.

<sup>65</sup> *See, e.g.*, Report of the Spectrum Efficiency Working Group at 2, 26.

<sup>66</sup> *Report* at 16.

license regime, the co-channel and adjacent channel licensees are clearly identifiable and the Commission has expressly retained authority to step in if necessary.<sup>67</sup>

As the Commission recognized in its rule making for the Upper 700 MHz band, adopting a flexible allocation does not relieve the Commission from continuing to ensure compatibility of the services allocated. Despite the flexible use allocation made for the Upper 700 MHz band (which included allocations for fixed, mobile and broadcast services), the Commission wisely adopted service rules that did not allow full-power conventional television stations to share this band with wireless services. The Commission stated that “[t]he inherent interference difficulties presented by sharing between these dissimilar services require that we orient our service rules to one service or the other, if efficient and intensive use of this spectrum is to be realized.”<sup>68</sup>

Importantly, as the Commission considers transitioning additional spectrum to flexible use, it must take into account the interference implications for co-channel and adjacent channel licensees within the subject band as well as services allocated in adjacent spectrum. The Report itself acknowledges that “[o]ne of the challenges presented by permitting additional flexibility within assigned spectrum is the potential for incompatible adjacent systems.”<sup>69</sup> The grant of flexible use rights will lead to different power levels, modulation techniques, and system architectures that can cause significant interference into existing systems in the same or adjoining areas or in adjacent spectrum within the newly flexible band. Adopting a uniform set of technical rules that would adequately protect both existing and new users could be exceedingly difficult and costly. Interference protection concerns also arise for services allocated in spectrum adjacent to the spectrum under transition. The Commission should reiterate, however, that the

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<sup>67</sup> See 47 C.F.R. §§ 24.232-24.238 (technical rules); *Amendment of the Commission’s Rules to Establish New Personal Communications Services*, Second Report and Order, 8 FCC Rcd. 7700, 7774 ¶ 177 (1993) (requiring coordination between co-channel and adjacent channel users); 47 C.F.R. § 24.238(e) (Commission retains discretion to require greater attenuation).

<sup>68</sup> *Service Rules for the 746-764 and 776-794 MHz Bands, and Revisions to Part 27 of the Commission’s Rules*, First Report and Order, 15 FCC Rcd 476, 483 ¶ 15 (2000).

<sup>69</sup> *Report* at 22.

technical rules for flexible use licenses, as well as new licensees and other spectrum users with flexible use rights, must afford sufficient interference protection to existing licensees. To that end, as the Report notes, “[s]ystem or device . . . incompatibility can require additional constraints in the form of guard bands, consuming valuable spectrum, or expensive filtering systems to avoid adjacent band interference.”<sup>70</sup> These measures may be the necessary cost for flexibility.

#### **4. Federal Government Coordination**

The Commission is responsible for managing spectrum usage by non-Federal Government users (including the private sector, state and local governments), whereas the National Telecommunications and Information Administration (“NTIA”) is the agency that manages Federal Government use of the spectrum. While each agency manages its particular sphere, the vast majority of spectrum allocated below 30 GHz is shared. The Task Force and others have aptly described challenges that have emerged between the two agencies as commercial and Government spectrum use has intensified.<sup>71</sup> With additional sharing between commercial and Government users contemplated in the future, coordination is increasingly important. AWS believes that, to be truly useful, the spectrum management techniques ultimately adopted by the Commission should become part of the NTIA framework as well. AWS supports the Task Force recommendation that the Commission, together with NTIA, continue efforts to improve coordination of shared allocations and spectrum use. AWS applauds Chairman Powell and Assistant Secretary Victory for their recent efforts in this regard.<sup>72</sup>

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<sup>70</sup> *Id.*

<sup>71</sup> *Id.* at 47, 60-61; General Accounting Office, *Better Coordination and Enhanced Accountability Needed to Improve Spectrum Management*, GAO 02-296 (Sept. 2002).

<sup>72</sup> FCC Press Release, *Chairman Powell and Assistant Secretary Victory Meet to Plan and Coordinate Spectrum Policy*, (rel. Dec. 10, 2002).

**B. The Commission Should Support Legislation To Create A Relocation Trust Fund.**

Finally, AWS supports the Task Force's recommendation that the Commission advocate legislation to allow auction proceeds to be used for a relocation trust fund for both Government and non-Government users.<sup>73</sup> Such a mechanism would help expedite the relocation of incumbent users and make more spectrum available more rapidly for flexible use applications. Commission experience demonstrates that where a strong relocation mechanism is in place, as with broadband PCS, the benefits are clear.

**CONCLUSION**

For the foregoing reasons, AWS requests the Commission to continue the transition to market-oriented spectrum usage policies within a sound spectrum management policy; recommends prompt adoption of the secondary markets initiative; and urges the Commission to study the spectrum environment before endorsing or launching the interference temperature concept.

Respectfully submitted,

**AT&T WIRELESS SERVICES, INC.**

/s/

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<sup>73</sup> See Report at 53.