Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

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

COMMENTS OF THE WI-FI ALLIANCE

The Wi-Fi Alliance ("the Alliance") hereby submits its comments on the Federal Communications Commission's ("Commission" or "FCC") Public Notice, ET Docket No. 02-135, entitled "Commission Seeks Public Comment on Spectrum Policy Task Force Report" ("Public Notice" or "Notice"). Specifically, the Alliance commends the FCC on its proactive approach to spectrum policy, and urges the Commission to: (1) designate additional bands for unlicensed spectrum and adopt, where appropriate, the recommended "commons" approach to spectrum allocation; and (2) adopt the recommended spectrum allocation policies that utilize "interference temperature thresholds" cautiously, with a recognition that predictive modeling, and the subjectivity inherent in such modeling, governs against the universal application of any established threshold.

I. DISCUSSION

The Alliance, formerly the Wireless Ethernet Compatibility Alliance ("WECA"), is an international trade association formed in 1999 to promote the adoption and commercialization of

products built according to the IEEE 802.11 specifications, including Wireless Local Area Networks ("WLANs") in the 2 GHz and 5 GHz frequency bands. Membership in the Alliance is open to all companies that support the WLAN standards, and current members include virtually all of the major radio manufacturers producing wireless network equipment and marketing such products in the United States.[1] The membership continues to expand and currently consists of over 190 companies. The Alliance's members are closely involved with the development, manufacturing and marketing of WLAN devices, and the Alliance therefore has particular interest in the recommendations posed in the Task Force Report.

A. To Promote Greater Efficiency And Ensure The Highest Value Use Of The Spectrum, The Commission Should Designate Additional Bands For Unlicensed Spectrum And Adopt, Where Appropriate, The Task Force Report's Recommended "Commons" Approach To Spectrum Allocation

As the Task Force Report recognized, advances in the development of unlicensed wireless devices—such as WLANs—have significantly increased the diversity of service offerings, qualitatively improved existing services, and are yielding significant technological and economic benefits in the form of low-power short-distance communications.[2] As the Report further notes, the convenience, efficiency and recognized benefits of unlicensed devices has lead to a surging consumer demand for spectrum-based services and devices.[3] As the Unlicensed Devices and Experimental Licenses Working Group observes, an estimated 5 million unlicensed WLAN devices were shipped in 2001 and by 2007, and an estimated 21 million American will

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[1] A complete membership list is available at the Alliance's website, www.wi-fi.org. Current members include, among others, 3Com, Acrowave, Agere Systems, AMD, Askey, Atheros, Cisco, Colubris, Connexion by Boeing, Dell, Gateway, Global Sun, Hewlett Packard, Intel, Intersil, Melco, Mobilian, Motorola, NextComm, Nokia, Philips, Proxim, Sony, Symbol, Texas Instruments, and Z-Com.

[2] *See* Task Force Report at 12, 40

[3] *See id*. at 12-13, 54. The Report notes that "[c]onsumers are increasingly demanding wireless computer and data networking" and that "the wireless LAN market posted its eighth consecutive quarter of double-digit growth; total growth from 2000 has been over 150 percent."

be using WLAN devices.[4] This increase in consumer demand is also unlikely to slow because technological advances in affordable unlicensed wireless communication products continues to spur market growth.[5]

The Task Force Report also recognizes, however, that due to the phenomenal growth in demand for spectrum-based services, access to available spectrum is becoming more and more limited, despite the existence of significant untapped spectrum capacity. Moreover, it is undisputed that the increasing demand for spectrum and the concomitant shortage of available spectrum is straining the outmoded "command-and-control" model of spectrum management. As Chairman Powell noted when outlining the critical elements of future spectrum policy at the Commission, government command-and-control "has served the country well to this point, but is futilely too slow to rapidly move things to new and better innovative uses."[6] In order to increase opportunities for technologically innovative and economically efficient spectrum use, the Task Force Report recommends that the Commission move away from the legacy command-and-control regulation that limits the ability of potential users to obtain access to spectrum and implement alternative models of spectrum allocation, such as the "commons" model, that allow for the "maximum feasible flexibility of spectrum use by both licensed and unlicensed users."[7] The Report also recommends that the Commission further optimize spectrum access by designating additional bands for unlicensed use, particularly given the significant and increasing market for unlicensed devices and the success that the creation of unlicensed bands has had in

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4 *See* Report of the Unlicensed Devices and Experimental Licenses Working Group at 7.

5 For instance, the growth of Wi-Fi certified products has exploded in the past eight months. Since testing began in March of 2002, 509 Wi-Fi product certifications have been awarded to 98 Wi-Fi Alliance member companies. In the past four months alone, 142 new Wi-Fi products have received certification, including new Wi-Fi certified products such as Wi-Fi Cable modems and Wi-Fi DSL modems.

6 *See* FCC Chairman Michael K. Powell Outlines Critical Elements of Future Spectrum Policy, News Release (rel. August 9, 2002).

7 Task Force Report at 15.

bringing the convenience, efficiency and recognized benefits of unlicensed devices to the American public.[8]

The Alliance strongly supports the Task Force's recommendation that the Commission move away from outmoded command-and-control regulation and towards more balanced regulatory approaches that increase the flexibility and efficient use of the spectrum. The Alliance also concurs with the Report's conclusion that additional spectrum is needed for unlicensed operations. Because the Alliance has unique access to the vast resources available to its members, it is well positioned to foretell the potential and the capacity needs of unlicensed wireless devices, including WLAN devices. The Alliance concurs with the Task Force Report's conclusions regarding the lack of available spectrum for unlicensed devices and believes that there will be a significant shortage of spectrum for unlicensed use in the very near future. The Alliance submits that this spectrum shortage and the anticipated congestion in the frequency bands currently allocated to unlicensed services will result in less than optimal use of the spectrum, stifling the innovation and development of new products and services that can benefit the U.S. public, its industries, and its economy. Accordingly, the Alliance urges to Commission to designate additional bands for unlicensed spectrum and adopt, where appropriate, the recommended "commons" approach to spectrum allocation. As the Report recognizes, the "commons" approach has particular applicability in the creation of "underlay" rights for low-power, low-impact unlicensed devices across the entire range of spectrum. Therefore, to the extent the Commission adopts the recommended "interference temperature" rules for particular frequency bands, the Alliance supports the Report's recommendation that the commons approach should presumptively be used for operations below the temperature threshold.

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[8] *See* Task Force Report at 54-55.

In addition, the Alliance notes that under their current allocation status, unlicensed devices do not receive any interference protection. As unlicensed devices such as WLAN products gain more ubiquitous and widespread use, however, this lack of protection becomes more of an issue for both users and manufacturers, and may stifle innovation and development in the market. To ensure that existing unlicensed devices and services can continue to grow, and also to address the public interest in high quality broadband wireless interconnection, the Alliance urges the Commission to create effective commons allocations that include some degree of class protection, such as licensing by rule for unlicensed devices and related equipment, as contemplated in Part 95 of the Commission's rules. This would create an environment of regulatory certainty, which will result in more competition and the development of more cost-effective unlicensed devices that use the allocated spectrum more efficiently.

B. While The Alliance Supports the Use of Interference Temperature in Defining Licensed Service Rights, the Commission Should Approach The Adoption Of Spectrum Allocation Policies That Utilize "Interference Temperature Thresholds" Cautiously

As the Task Force Report recognizes, interference management will remain a central challenge for the Commission when adopting new spectrum management policies that accommodate the high demand for spectrum-based services and devices for both licensed and unlicensed services. The Commission's current interference rules, which protect licensees that operate on a primary basis from "harmful" interference, were developed based in large part on the expected nature of a single service's technical characteristics in a given band. As the Report of the Interference Protection Working Group noted, however, if flexible and efficient use of the spectrum is to be fully realized, it will become increasingly difficult to pre-determine interference ranges, as the predictive modeling used to demonstrate the spectrum sharing

compatibility of two or more waveforms will become increasing complicated, time-consuming and costly.[9] According to the Task Force Report, "the rapidly changing technology and RF environment will challenge the continued effectiveness of such current approaches as predictive interference modeling, technology compatibility testing, and spectrum use decisions based on a qualitative knowledge of the local environment."[10]

Recognizing that comprehensive interference predictive analyses are not always possible given the increasingly intensive and flexible use of the spectrum, combined with the greater density, mobility and variability of RF emitters, the Task Force Report recommends the Commission adopt a more quantitative approach to interference management when allocating spectrum, one that utilizes "interference temperature thresholds" for quantifying and managing interference at the receiver level, together with the continued use of established "acceptable" levels of interference.[11] The Alliance supports the Taskforce's recommendations and urges the Commission to adopt interference mitigation policies, such as the "interference temperature metric," that significantly enhance interference management and spectrum allocation by providing incumbents and licensed users with greater certainty regarding permissible levels of interference while at the same time recognizing the increasing importance and ubiquity of low-power, unlicensed devices by increasing their access to the frequency band.

As the Taskforce Report noted, however, the recommended "interference temperature" paradigm is a long-term solution. Until smart technologies are technically viable and widespread in use—such as software-defined radios capable of monitor their local RF environment and operating more dynamically than traditional technologies—the use of predictive modeling will

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[9] *See* Report of the Interference Protection Working Group at 4-5.

[10] Task Force Report at 26.

[11] *See id*. at 26-30.

remain an essential tool when analyzing adjacent channel emissions limitations and the impact of the deployment of low-power services below the interference temperature threshold.[12] Thus, at least in the short term, predictive modeling, which necessarily involves imposing a variety of subjective factors not universally present in today's flexible and evolving RF environment,[13] will remain a central component in the Commission's spectrum allocations. The Alliance therefore urges the Commission to approach the development of quantitative standards cautiously, with a recognition that the subjectivity inherent in any attempts to measure the current RF environment cautions against the establishment of hard-and-fast, universally applied "threshold levels" of maximum permissible levels of interference when considering new spectrum allocations.

II. CONCLUSION

For the foregoing reasons, the Alliance respectfully requests that the Commission: (1) designate additional bands for unlicensed spectrum and adopt, where appropriate, the recommended "commons" approach to spectrum allocation; and (2) adopt the recommended spectrum allocation policies that utilize "interference temperature thresholds" cautiously, with a

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[12] *See* Task Force Report at 13 (noting that predictive models can "perhaps [be] eventually replaced" by techniques that take into account and assess actual, rather than predicted, interference, techniques made possible by the increased ability of "smart" technologies to monitor their local RF environment and operate more dynamically than traditional technologies).

[13] *See id*. at 28 ("The degree of certainty of the estimate of the [RF] environment would depend on such factors as transmitter signal ranges, uniformity of signal levels over an area, the density of temperature measuring devices and the sharing of the data taken by nearby devices; *e.g.*, through "*ad hoc* cooperative wireless networks.").

recognition that predictive modeling, and the subjectivity inherent in such modeling, governs against the universal application of any established threshold.

Respectfully submitted,

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