

**Before the
Department of Commerce
National Telecommunications and Information Administration
Washington, DC 20230**

In the Matter of)	
)	
Developing a Sustainable Spectrum Strategy for America’s Future)	Docket No. 181130999-8999-01
)	

**COMMENTS OF
THE WIRELESS INTERNET SERVICE PROVIDERS ASSOCIATION**

The Wireless Internet Service Providers Association (“WISPA”) hereby comments in response to the Notice and Request for Comments (“RFC”) in the above-captioned proceeding regarding developing a comprehensive, long-term national spectrum strategy.¹

Introduction

WISPA represents the interests of wireless Internet service providers (“WISPs”) that provide high-speed fixed wireless broadband services to consumers, businesses, first responders, and community anchor institutions across the country. WISPA’s members include more than 800 WISP operators, equipment manufacturers, distributors and other entities committed to providing affordable and competitive fixed broadband services. WISPs typically use unlicensed spectrum and, where available, lightly-licensed spectrum (or “shared access” spectrum) and licensed spectrum, to deliver last-mile broadband and voice services to more than four million consumers in rural and other unserved and underserved areas where other providers decline to invest. Many WISPs also deploy underground and aerial fiber as part of hybrid wireless/fiber broadband networks where it is economically feasible for them to do so and there is sufficient

¹ *Developing a Sustainable Spectrum Strategy for America’s Future*, Notice and Request for Comment, 83 Fed. Reg. 65640 (Dec. 21, 2018).

consumer demand. Typical download speeds are in the range of 5 to 50 Mbps, a number that will increase as technology improves and equipment costs become more competitive.²

In many proceedings before the Federal Communications Commission (“FCC”), WISPA has advocated for a balanced approach to spectrum policy that allocates spectrum for licensed, shared access and unlicensed spectrum for flexible use for both fixed and mobile services. A few recent examples are summarized below:

- WISPA advocated for unlicensed outdoor use of the 5150-5250 MHz band on a shared basis with existing satellite operations.³
- WISPA advocated for adoption of the three-tier Spectrum Access System (“SAS”) that governs use of 150 megahertz of spectrum in the Citizens Broadband Radio Service (“CBRS”).⁴
- WISPA, as a founding member of the Broadband Access Coalition, is advocating for rules that would permit licensed fixed wireless services in 300 megahertz of the C-band for shared use with fixed satellite receive-only earth stations.⁵
- WISPA is asking the FCC to adopt a Further Notice of Proposed Rulemaking to consider sharing among licensed and unlicensed users in the 5850-5925 MHz band, which is currently licensed for a single technology and single use.⁶

² See The Carmel Group, *Ready for Takeoff: Broadband Wireless Access Providers Prepare to Soar with Fixed Wireless*, the BWA Industry Report (2017) (“Carmel Group Report”), available at http://www.wispa.org/Portals/37/Docs/Press%20Releases/2017/TCG's_2017_BWA_FINAL_REPORT.pdf (last visited Jan. 17, 2019) (“Carmel Report”), at 5.

³ See, e.g., Comments of WISPA, ET Docket No. 13-49 (filed May 28, 2013); Reply Comments of WISPA, ET Docket No. 13-49 (filed July 24, 2013).

⁴ See WISPA Comments, GN Docket No. 12-354 (filed Feb. 20, 2013); WISPA Reply Comments, GN Docket No. 12-354 (filed Apr. 5, 2013); WISPA Comments, GN Docket No. 12-354 (filed Dec. 5, 2013); WISPA Reply Comments, GN Docket No. 12-354 (filed Dec. 20, 2013); WISPA Comments, GN Docket No. 12-354 (filed July 14, 2014); WISPA Reply Comments, GN Docket No. 12-354 (filed Aug. 15, 2014). See also WISPA Comments, ET Docket No. 10-123 (filed Apr. 22, 2011).

⁵ See Comments of the Broadband Access Coalition, GN Docket No. 18-122 (filed Oct. 29, 2018); Reply Comments of the Broadband Access Coalition, GN Docket No. 18-122 (filed Dec. 11, 2018).

⁶ See Letter from Claude Aiken, WISPA President & CEO, to Marlene H. Dortch, FCC Secretary, ET Docket No. 13-49 (filed Oct. 26, 2018) (“WISPA 2018 Letter”).

- WISPA is advocating for rules that would assign vacant Educational Broadband Service spectrum in the 2.5 GHz band, which is especially prevalent in rural areas west of the Mississippi River, for commercial fixed broadband service.⁷
- WISPA will be filing Comments with the FCC seeking access to spectrum in the 6 GHz for unlicensed use on a shared basis with incumbent point-to-point services.⁸

Against this backdrop, WISPA is pleased that NTIA is taking an active role in developing an overarching national spectrum policy that will inform the Executive Branch and create greater certainty to guide legislators and regulators.

Discussion

As described in more detail below in WISPA's responses to the specific questions posed in the RFC, effective spectrum policy must be guided by three fundamental principles. *First*, NTIA should declare that spectrum is the quickest and most cost-effective way to provide access to broadband services to rural areas that lack access or choice. As the Carmel Report indicates, residential fixed wireless technology can be deployed at a fraction of the cost of fiber and cable, platforms that are not suitable for widespread deployment in sparsely populated areas given the extremely long time for investment to be recouped.⁹ WISPs can also easily deploy where the terrain or protected status of land makes installing fiber physically impossible or impractical, such as in areas with granite fields or in national forests where construction is much more limited. With low barriers to entry that do not require fixed plant to be installed underground or on poles, spectrum serves as critical infrastructure to help bridge the digital divide.

⁷ See WISPA Comments, WT Docket No. 18-120 (filed Aug. 8, 2018); WISPA Reply Comments, WT Docket No. 18-120 (filed Sept. 7, 2018).

⁸ *Unlicensed Use of the 6 GHz Band; Expanding Flexible Use in Mid-Band Spectrum Between 3.7 and 24 GHz*, Notice of Proposed Rulemaking, ET Docket No. 18-295 and GN Docket No. 17-183, FCC 18-147 (rel. Oct. 24, 2018).

⁹ Carmel Report at 12, Fig. 6.

Second, spectrum policy should favor a balance of unlicensed, shared access and licensed allocations for flexible use, both fixed and mobile, and should not mandate specific technologies or use cases. As NTIA is aware, it is increasingly difficult to find or clear spectrum nationwide, and spectrum access models that promote efficient geographic sharing with Federal and commercial incumbents must be a part of an overall policy approach. Moreover, rural Americans and evolving Internet of Things (“IoT”) use cases such as precision agriculture and telehealth should not be consigned forever to unlicensed spectrum.

Third, licensed spectrum should be accessible to small broadband providers through various means such as small geographic license areas and build-out rules that incentivize deployment to rural areas or leasing of spectrum in rural areas. Policies also should provide incentives for build-out to rural areas instead of relying solely on vague build-out standards that have led to significant spectrum warehousing.

Below, WISPA responds to each of the RFC’s seven questions.

1. In what ways could the predictability of spectrum access for all users be improved?

In examining the “predictability of spectrum access,” WISPA considers two separate aspects of spectrum policy. First, predictability can be enhanced through spectrum management databases developed through multi-stakeholder groups employing algorithms for interference management. Second, there can be greater predictability of spectrum access through timelines for making new commercial spectrum bands available. Both of these aspects are discussed below.

Over the last 15 years or so, the FCC’s spectrum allocation scheme has evolved from the binary licensed-unlicensed model to approaches that leverage databases and technology to enable greater spectral efficiency and use. In 2005, the FCC adopted a “light licensing” scheme for the

3650-3700 MHz band in which applicants could obtain nationwide, non-exclusive licenses and provide service upon registration of individual fixed locations in the FCC’s Universal Licensing System (“ULS”).¹⁰ Licensees are encouraged to review ULS before registering locations, to coordinate operations with each other and to cooperate to resolve interference. Overall, there have been very few instances of interference requiring FCC resolution. From this manual spectrum sharing model, in 2008 the FCC adopted rules allowing unlicensed use of vacant television channels governed by a database that identifies whether or not a TV channel is vacant and therefore available for unlicensed use in a given area.¹¹ This was the first time the FCC delegated real-time spectrum management functions to private database administrators that collaborated to build an interference management system. More recently, in 2015, the FCC adopted its CBRS rules that established a three-tier spectrum access system that dynamically assigns spectrum not just on given channels in given areas, but in given access tiers – incumbent use, priority licensing and licensed-by-rule general access.¹²

With each evolutionary step in spectrum management, the FCC has increased certainty with respect to when, where and on what tier spectrum access can be provided, reducing engineering disputes over what constitutes “harmful” or “unacceptable” levels of interference. By utilizing automated spectrum access with openly transparent database management, stakeholders and spectrum users are able to more reliably predict what they can do with spectrum. These spectrum sharing methods and techniques can be successfully implemented in other spectrum bands, creating more certain outcomes.

¹⁰ See *Wireless Operations in the 3650-3700 MHz Band*, 20 FCC Rcd 6502 (2005).

¹¹ See *Unlicensed Operations in the TV Broadcast Bands*, 23 FCC Rcd 16807 (2008).

¹² See *Amendment of the Commission’s Rules with Regard to Commercial Operations in the 3550-3650 MHz Band*, 30 FCC Rcd 3959 (2015).

As a second measure, NTIA can develop timelines to clear Federal users or enable sharing among Federal and non-Federal commercial users. In a similar vein, the FCC can also establish timelines for allocating “new” spectrum and providing a roadmap for when spectrum may become available, including when spectrum auctions are held, in as much advance as possible. These initiatives will enable spectrum users to better plan for future spectrum needs and to develop in parallel the standards, technology and equipment that can satisfy those needs.

2. To what extent would the introduction of automation facilitate assessments of spectrum use and expedite the coordination of shared access, especially among Federal and non-Federal spectrum stakeholders?

As the President stated in his Memorandum, the United States Government is committed to finding additional opportunities to share spectrum between both Federal and non-Federal spectrum stakeholders.¹³ To this end, collaboration between Federal and non-Federal entities in regard to spectrum uses can potentially create a more flexible and shared paradigm between the two.

One of the by-products of spectrum automation is the ability of the database management system to measure actual spectrum use in terms of time, location, power and frequency. By measuring these spectral dimensions, regulators can better target spectrum use policies and rules in ways that maximize efficiency and use. Such analysis could conceivably lead to flexible, time-based spectrum sharing or other techniques that will enable more spectrum to be used more of the time instead of laying fallow at certain times of the day or in certain locations.

Allowing and encouraging flexible spectrum use is universally beneficial. Mandating specific technologies or specific uses can lead to significant non-use of spectrum, as has been the case with the 5.9 GHz band where the FCC allocated 75 megahertz of spectrum for Dedicated

¹³ See Memorandum for the Heads of Executive Departments and Agencies, *Developing a Sustainable Strategy for America's Future*, 83 Fed. Reg. 54513 (Oct. 30, 2018) (“Memorandum”).

Short Range Communications. Over nearly 20 years, that band remains largely underutilized while, in neighboring unlicensed 5 GHz U-NII bands there has been significant innovation and deployment of Wi-Fi and rural broadband. The FCC has come to recognize that flexible, market-driven uses for spectrum allocation and sharing enable long-term innovation.¹⁴

Continuous coordination among Federal and non-Federal stakeholders would serve to further the goals of flexible spectrum use.

Automated spectrum management also can be used to lower transactional costs in secondary market transactions. Through private exchanges built on spectrum management platforms, real-time spectrum transactions can be efficiently enabled to promote spectrum sharing and use on the basis of geography, time, frequency and power.

3. What is the practical extent of applying standards, incentives, and enforcement mechanisms to promote efficient and effective spectrum use?

Over the years, it has proved difficult for the FCC to apply its “substantial service” build-out, renewal and permanent discontinuance rules in a consistent manner. This has led to extensive litigation,¹⁵ controversial settlements,¹⁶ and spectrum warehousing that keeps spectrum

¹⁴ See, e.g., *Service Rules for Advanced Wireless Services in the 2000-2020 MHz and 2180-2200 MHz Bands*, 27 FCC Rcd 16102,16112 (2012) (“the rules we adopt today represent the Commission’s efforts to make more spectrum available for *terrestrial flexible use*, including for mobile broadband, in the public interest, without imposing undue restrictions on the use of the spectrum.”) (emphasis added); *Service Rules for Advanced Wireless Services H Block - Implementing Section 6401 of the Middle Class Tax Relief and Job Creation Act of 2012 Related to the 1915-1920 MHz and 1995-2000 MHz Bands*, 28 FCC Rcd 9483, 9484 (2013) (“Today we increase the Nation’s supply of spectrum for *flexible-use services*, including mobile broadband.”) (emphasis added); *Promoting Interoperability Order in the 700 MHz Commercial Spectrum*, 28 FCC Rcd 15122, 15134 (“the Commission *adopted a flexible use approach* to allow for fixed and mobile services, along with ‘broadcast and other broadband applications that could include two-way interactive, cellular, and mobile television broadcasting services.’”) (emphasis added); *Reallocation and Service Rules for the 698-746 MHz Spectrum Band*, 17 FCC Rcd 11613, 11615 (2002) (“By taking these steps, we seek to promote the transition to DTV, meet our statutory mandate to reclaim and license this spectrum by competitive bidding, and *enable the flexible use of the Lower 700 MHz Band for a wide range of new services.*”) (emphasis added).

¹⁵ See, e.g., *FiberTower Spectrum v. FCC*, 782 F.3d 692 (D.C. Cir. 2015); *Melcher v. FCC*, 134 F.3d 1143 (D.C. Cir.1998).

¹⁶ See, e.g., *Straight Path Communications, Inc.*, 32 FCC Rcd 284 (2017).

from those that may want to use it. Current FCC rules generally determine build-out compliance in a licensed area according to a minimum population coverage milestone that is more easily achieved through transmission of signals over heavily populated urban areas. If the Federal government is serious about bridging the rural broadband divide, rules should favor deployment in harder-to-serve rural areas. One concept worthy of discussion is “spectrum homesteading,” which would grant additional rights to licensees that build out to more rural areas. These incentives could include a longer license term or even bidding credits that could be used in future spectrum auctions.

4. How might investment in RDT&E improve spectrum-utilization methods and spectrum-sharing tools and techniques?

Working together, industry and Federal government stakeholders have made considerable investment in the SAS that will govern spectrum access in CBRS. As a first-of-its-kind database involving fixed, mobile and shipborne uses across three different access tiers, stakeholders have moved carefully and conservatively to ensure the SAS provides interference protection to incumbents and assigns spectrum in accordance with FCC rules.

This multi-stakeholder process can serve as a paradigm for future spectrum bands where similar protection needs are required. Through a course of conduct that has, hopefully, created mutual familiarity and trust among stakeholders, WISPA is optimistic that future database development efforts can be implemented more quickly. That said, it is important for stakeholders to understand that a complicated, three-tier system may not be necessary in all shared bands. Federal incumbents (especially airborne and shipborne) present unique problems, and sharing with mobile services also introduces complexity. But when sharing is between or among categories of fixed users, automated frequency coordination should be simpler and easier to develop.

As stated in the Memorandum, developing flexible models for spectrum management and investments is a key policy goal.¹⁷ To this end, as the CBRS SAS is successfully implemented, WISPA anticipates that there will be significant investment in automated spectrum management. This will not only be useful in the United States, but will enshrine our nation as a global leader in spectrum management.

5. What are the risks, if any, to the global competitiveness of U.S. industries associated with spectrum management and policy actions?

One of the theoretical risks of innovative spectrum management and policy actions is the potential that the rest of the world may not follow suit. In WISPA's view, the potential for a lack of harmonization should not stand in the way of making more spectrum available to be used more efficiently. Many countries do not have the incumbent Federal uses that the United States has in certain bands (e.g., CBRS and the 3100-3500 MHz band) that demand spectrum databases and dynamic sharing to accommodate increasing consumer demand for bandwidth-intensive uses and applications. When faced with a choice, Federal policy should favor promoting spectrum sharing that will promote innovation and create economic benefits from new services over global harmonization.

6. How could a spectrum management paradigm be structured such that it satisfies the needs of commercial interests while preserving the spectrum access necessary to satisfy the mission requirements and operations of Federal entities?

As an initial measure, Federal spectrum usage should be audited to determine the extent to which such spectrum is being used and to determine whether the band can be cleared or, more likely, shared with non-Federal users. Congress has taken steps in this direction with the amendment of the Spectrum Relocation Fund.¹⁸

¹⁷ Memorandum at 54513.

¹⁸ 47 U.S.C. § 928.

Federal policymakers and managers, in particular NTIA and the Department of Defense, should continue their efforts to implement spectrum sharing. The cooperation that has occurred in the CBRS band has been critical in both developing appropriate interference protection measures and building trust between Federal and non-Federal stakeholders. By continuing to work together, these collaborative efforts can become more institutionalized and more rapidly implemented, thereby enabling commercial spectrum to be accessed more quickly. As first-hand witnesses and participants in the WinnForum standard-development process that is finalizing the software necessary to open the CBRS band to commercial use, WISPA strongly encourages these efforts.

WISPA also has been involved with Federal stakeholders in connection with purported interference at Patrick Air Force Base near the Cape Canaveral launch site. In WISPA's experience, the governmental interests have taken heavy-handed approaches with broadband providers and have been unwilling to provide private industry with certain information that could be used to effectively analyze and resolve problems in an efficient and reasonable manner.

7. What are the likely future needs of spectrum users, both terrestrially and for space-based applications within the next 15 years? In particular, are present allocations of spectrum sufficient to provide next generation services like Fifth Generation (5G) cellular services and emerging space-based applications?

There is a clear need for more mid-band spectrum to be available for fixed wireless broadband services. These spectrum bands are perfectly and uniquely suited for rural area deployment where vertical infrastructure is lacking and small cell networks using frequency reuse are impractical, if not impossible. The propagation characteristics of mid-band spectrum coupled with the cost-effectiveness of fixed wireless technology create a golden opportunity for the digital divide to be bridged. While 5G (however defined) may be an important policy objective, Federal policy also should not forget those that have "no G" – the millions of rural

Americans who lack access to terrestrial broadband service – and mid-band spectrum is the Holy Grail. As the Memorandum states, wireless technologies are “bring[ing] broadband to rural, unserved, and underserved parts of America,”¹⁹ and these areas should not be pushed aside for the sake of 5G.

To this end, the 300 megahertz of C-band spectrum the FCC is considering for fixed uses will help meet consumer demand. Its proximity to the existing CBRS band means that equipment can be quickly developed to operate in the band such that WISPA’s members, IoT companies, venues and others can take advantage of the low barriers to entry and offer affordable service to the public.

Conclusion

WISPA appreciates the opportunity to help NTIA examine a sustainable spectrum policy model, and urges inclusion of the principles, experiences and recommendations discussed above.

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¹⁹ Memorandum at 54513