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

In the Matter of	)	
	)	
Wireless Telecommunications Bureau	)	
and Office of Engineering and Technology	)	GN Docket Nos. 14-177, 15-319,
Seek Comment Pursuant	)	17-183, and 17-258
to The Spectrum Pipeline Act Of 2015	)	
	)	

REPLY COMMENTS OF FEDERATED WIRELESS, INC.

Federated Wireless, Inc. ("Federated Wireless") hereby replies to the comments filed in response to the public notice issued by the Federal Communications Commission ("Commission") seeking information about the effects of establishing the spectrum sharing regime for the Citizens Broadband Radio Service ("CBRS") at 3550-3700 MHz and the opportunity for additional spectrum bands to be shared among incumbent users and new licensed and unlicensed users.[1] As described more fully herein, the record in this proceeding demonstrates that (1) the Commission's establishment of and continued progress toward commercial launch of the CBRS ensures continued U.S. leadership in the race to 5G; (2) the intense industry interest and investment in the band emphatically underscores the success of the Commission's innovative use of cross-industry stakeholder organizations to bring the CBRS spectrum to market, and (3) spectrum sharing regimes and dynamic sharing technologies should be leveraged to maximize spectrum utilization based on the peculiar characteristics of each frequency band.

[1] *In the Matter of Wireless Telecommunications Bureau and Office of Engineering and Technology Seek Comment Pursuant to The Spectrum Pipeline Act of 2015*, GN Docket Nos. 14-177, 15-319, 17-183, and 17-258, Public Notice, DA 18-841 (WTB/OET rel. Aug. 10, 2018).

I. THE RECORD IS CLEAR THAT THE CBRS IS AN INTEGRAL COMPONENT OF THE UNITED STATES' CONTINUED LEADERSHIP IN THE GLOBAL RACE TO 5G.

A number of commenters agreed with Federated Wireless that the CBRS will play a critical role in providing the mid-band spectrum access needed to ensure that the United States leads the world in the race to 5G. As CTIA explained, "wireless carriers in the United States need access to mid-band spectrum in the near term to maintain and improve America's position in the global 5G race. CTIA is encouraged that reforms proposed in the 3.5 GHz and 3.7-4.2 GHz bands . . . will lead the way."[2] The Public Interest Spectrum Coalition ("PISC") similarly noted that CBRS will be a "critical part of the foundation for the nation's 5G future and empower small and rural internet service providers, schools, hospitals, factories, office buildings, IoT and other niche connectivity providers to customize and operate their own private LTE networks that would be supplemented by Wi-Fi offload."[3] Ruckus Networks ("Ruckus") also observed the importance of CBRS to the nation's 5G future, and Federated Wireless agrees that "dynamic, shared-access frameworks that enable quicker and easier access to spectrum are critical to the future growth and continued strength of America's wireless services, and that such frameworks also demonstrate continuing international leadership by the United States. This is especially important as we progress into the '5G era' with the growing need for mid-band spectrum and spectrum management frameworks that will enable and encourage dense deployments of small cells by a wide range of participants."[4]

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[2] Comments of CTIA, GN Docket Nos. 14-177, 17-183, 17-258, 15-319, at 3 (filed Sep. 11, 2018).

[3] Comments of the Open Technology Institute at New America, the American Library Association, the Benton Foundation, Consumer Federation of America, Consumers Union, the Institute for Local Self-Reliance, National Hispanic Media Coalition, Next Century Cities, Public Knowledge, the Schools Health & Libraries Broadband (SHLB) Coalition, and X-Lab, GN Docket Nos. 14-177, 17-183, 17-258, 15-319, at 3 (filed Sep. 11, 2018) ("PISC Comments").

[4] Comments of Ruckus Networks, a company of ARRIS U.S. Holdings, Inc., GN Docket Nos. 14-177, 17-183, 17-258, 15-319, at 9 (filed Sep. 11, 2018) ("Ruckus Comments").

In light of the industry consensus around the significant role of the CBRS in the United States' efforts to maintain its global leadership position in the development and deployment of 5G technologies and services, it is paramount that the Commission continue its work to expeditiously authorize CBRS initial commercial deployments ("ICD"),[5] and issue final certifications to Spectrum Access System Administrators and Environmental Sensing Capability Operators to enable full commercialization of the CBRS band. Federated Wireless thus joins Ruckus in its expectation that "all of the parties involved in the standardization and authorization of CBRS services, federal and industry, will work together to launch initial commercial services in 2018 and proceed swiftly to full commercial operations in the band shortly thereafter, while ensuring that all of the component systems and incumbent protections are functioning as intended."[6] As Federated Wireless explained in its initial comments, this will not only aid the Commission and industry in their efforts to secure global leadership in the race to 5G, but will also create material positive impacts on the economy and for consumers, and validate the effectiveness of new tools the Commission used to create the CBRS, including valuable spectrum sharing mechanisms.

II. COMMENTERS AGREE WITH FEDERATED WIRELESS THAT THE COMMISSION'S INNOVATIVE USE OF CROSS-STAKEHOLDER ORGANIZATIONS TO FACILITATE THE DEVELOPMENT OF THE CBRS HAS GENERATED TREMENDOUS BENEFITS.

Ruckus, PISC, the Wireless Innovation Forum ("WInnForum"), the Dynamic Spectrum Alliance ("DSA") joined Federated Wireless in noting the resounding success of the Commission's rule changes establishing the CBRS, and in particular its forward-leaning use of

[5] *Wireless Telecommunications Bureau and Office of Engineering and Technology Establish Procedure and Deadline for Filing Spectrum Access System Initial Commercial Deployment Proposals*, GN Docket No. 15-319, Public Notice, DA 18-783 (WTB/OET 2018).

[6] Ruckus Comments at 10.

consensus organizations to foster the development of technologies and standards for the band. Federated Wireless agrees with PISC that this represents "represent a landmark in forward-thinking spectrum policy not only for the 3.5 GHz band, but as a model for unlocking substantial, low-cost capacity for wireless broadband and innovation in additional occupied but underutilized bands."[7]

The WInnForum correctly points out that the Commission's approach to the CBRS, and in particular its reliance on reliance on multi-stakeholder organizations such as the WInnForum and the CBRS Alliance has led to significant achievements in "four key areas: stakeholder participation, standards development, certifications, and support for the evolution of technical regulations."[8] DSA notes that the multi-stakeholder processes employed in the CBRS have been "welcomed by a broad community of entities from across the telecommunications industry as well as other sectors of the economy that recognize the importance of connectivity for their own competitiveness in the 21st Century,"[9] and Ruckus explains that the processes have further "involved an unprecedented level of interaction and collaboration among industry, NTIA, and DoD."[10] This partnership with the Commission, the National Telecommunications and Information Administration ("NTIA"), and the Department of Defense ("DoD") has been incredibly fruitful and played an integral role in bringing the CBRS to the brink of commercialization in a few short years. NTIA, DoD, and in particular the U.S. Navy have been indispensable partners, working diligently and efficiently throughout this process to enable

[7] PISC Comments at 3.

[8] Comments of the Wireless Innovation Forum on the Federal Communications Commission Public Notice Pursuant to the Spectrum Pipeline Act of 2015, GN Docket Nos. 14-177, 17-183, 17-258, 15-319, at 5 (filed Sep. 7, 2018).

[9] Comments of the Dynamic Spectrum Alliance, GN Docket Nos. 14-177, 17-183, 17-258, 15-319, at 2 (filed Sep. 11, 2018).

[10] Ruckus Comments at 5.

maximal commercial access to valuable spectrum while ensuring that critical federal operations are sufficiently protected, in stark contrast to PISC's unfounded and unsupported claims of "delays" created by federal partners.[11] Federated Wireless looks forward to its continued partnership with the Commission, NTIA, and DoD as all parties redouble their efforts to expeditiously enable full commercialization of the CBRS band.

The record thus confirms the success of the Commission's innovative approach to the CBRS, leveraging both dynamic spectrum access technologies and cross-industry stakeholder organization. As Federated Wireless described in its initial comments, the effect this has been to dramatically reduce time to market over legacy "clear and auction" approaches to spectrum management, and to provide a roadmap for spectrum management regimes that facilitates collaboration between the Commission and industry, maximizes spectrum utilization by supporting dense and varied uses within a single band, and balances the needs of government users, incumbents, new licensed users, and unlicensed users. The Commission's report to Congress should note the categorical success of the CBRS framework in meeting each of these goals, and affirm the Commission's commitment to leveraging this model to fit other frequency bands and meet the ever-growing demand for wireless spectrum access.

III. THE COMMISSION SHOULD LEVERAGE SPECTRUM SHARING AND DYNAMIC SPECTRUM ACCESS TECHNOLOGIES TO ADDRESS THE UNIQUE CHARACTERISTICS OF EACH FREQUENCY BAND.

The National Public Safety Telecommunications Council ("NPSTC") and EchoStar Satellite Operating Company and Hughes Network Systems, LLC (together, "EchoStar") argue that "it is not valid to assume results of testing SAS and ESC systems at 3.5 GHz would have validity for sharing in other bands," and thus question the use of dynamic sharing technologies

[11] *See* PISC Comments at 10-13.

more generally.[12] As an initial matter, Federated Wireless agrees that "any system of dynamic spectrum sharing must be designed based on the specifics of the relevant spectrum environment, including the systems to be protected."[13] Federated Wireless further agrees that "[p]rotecting incumbent operations from harmful interference is essential and must be carefully weighed against the potential new uses of such bands that sharing could enable."[14]

Neither of these considerations, however, militates against the Commission's broader use of dynamic spectrum access technologies in frequency bands beyond the CBRS. In fact, the need to protect incumbent users while enabling spectrum access by new entrants requires that the Commission leverage the flexibility of dynamic sharing technologies to ensure dense, efficient spectrum utilization throughout the radiofrequency spectrum in a manner that accounts for the peculiar characteristics and incumbent profiles of each band.

As Federated Wireless has previously explained, the technological underpinnings of dynamic spectrum sharing technologies—including propagation modeling, radio environment sensing, cloud computing, and cognitive radio—are well known, proven technologies widely used throughout the information and communications technology sector. These technologies are highly scalable and configurable, and thus any implementation of a dynamic sharing regime can be tailored to the characteristics and needs of a particular band. This flexibility allows dynamic sharing solutions to rapidly adjust to enable new use cases as they develop while ensuring protection to incumbent users, both from moment to moment and as future systems evolve. This

[12] Comments of the National Public Safety Telecommunications Council, GN Docket Nos. 14-177, 17-183, 17-258, 15-319, at 4 (filed Sep. 11, 2018) ("NPSTC Comments"); *see also* Comments of EchoStar Satellite Operating Company & Hughes Network Systems, LLC, GN Docket Nos. 14-177, 17-183, 17-258, 15-319, at 3-6 (filed Sep. 11, 2018) ("EchoStar Comments").

[13] NPSTC Comments at 4; *see also* EchoStar Comments at 5 ("Every band is unique and requires its own spectrum sharing model with respect to its incumbent and future operations.").

[14] EchoStar Comments at 6.

is particularly powerful when combined with robust cross-industry stakeholder collaboration of the type leveraged so successfully in the CBRS, which enables the conduct of "the proper evaluation and study of the consequences of potential spectrum sharing in a given frequency band to ensure that incumbent operations will not be harmed by new entrants."[15]

The record in this proceeding and elsewhere demonstrates the myriad advantages of dynamic spectrum sharing technologies and dynamic access regimes. The Commission should thus affirm in its report to Congress its commitment to studying and leveraging these technologies throughout the radiofrequency spectrum, including in the 3.7-4.2 GHz, 3.45-3.55 GHz, 3.1-3.45 GHz, 5.925 GHz-7.125 GHz, 37 GHz, 26 GHz, 70/80 GHz and 4.9 GHz bands that Federated Wireless identified in its initial comments. Doing so will enable spatial reuse and sharing of spectrum among incumbents and new users, significantly increasing utilization while reliably ensuring protection of incumbent and priority uses, and provide operational and regulatory flexibility to address the policy and technical challenges that inevitably arise when redeploying spectrum with incumbent users.

IV. CONCLUSION

Federated Wireless again commends the Commission on its leadership in establishing and implementing the innovative CBRS sharing framework, which will imminently bring valuable spectrum and the advantages of dynamic spectrum sharing technologies to market, to immense consumer benefit. The Commission should, in its report to Congress, commit to building on this success by exploiting the lessons learned through the CBRS proceeding to apply dynamic sharing technologies throughout the radiofrequency spectrum, including at .7-4.2 GHz, 3.45-3.55 GHz, 3.1-3.45 GHz, 5.925 GHz-7.125 GHz, 37 GHz, 26 GHz, 70/80 GHz and 4.9 GHz, to

[15] *Id.*

maximize the efficiency of spectrum utilization, protect incumbent and priority users, and facilitate the development and market entry of innovative technologies and services.

Respectfully submitted,

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