

**Before the
Federal Communications Commission
Washington, D.C. 20554**

In the Matter of)	
)	
Expanding Flexible Use of the 3.7 to 4.2 GHz Band)	GN Docket No. 18-122
)	
Expanding Flexible Use in Mid-Band Spectrum Between 3.7 and 24 GHz)	GN Docket No. 17-183 (Inquiry Terminated as to 3.7-4.2 GHz)
)	
Petition for Rulemaking to Amend and Modernize Parts 25 and 101 of the Commission’s Rules to Authorize and Facilitate the Deployment of Licensed Point-to-Multipoint Fixed Wireless Broadband Service in the 3.7-4.2 GHz Band)	RM-11791
)	
Fixed Wireless Communications Coalition, Inc., Request for Modified Coordination Procedures in Band Shared Between the Fixed Service and the Fixed Satellite Service)	RM-11778
)	

COMMENTS OF FEDERATED WIRELESS, INC.

Federated Wireless, Inc. (“Federated Wireless”) offers these comments in response to the Notice of Proposed Rulemaking (“NPRM”) issued by the Federal Communications Commission (“Commission”) in the above-captioned proceeding.¹ Federated Wireless commends the Commission for its continued leadership in making available low-, mid-, and high-band spectrum for flexible use to meet the surging demand for broadband services. To further the Commission’s broadband goals in the 3.7-4.2 GHz band, Federated Wireless urges the Commission to leverage readily available dynamic spectrum sharing technologies, which will: (1) most quickly facilitate access to this crucial mid-band spectrum, advancing continued U.S. leadership in the global race

¹ *Expanding Flexible Use of the 3.7 to 4.2 GHz Band*, GN Docket No. 18-122, Order and Notice of Proposed Rulemaking, FCC 18-91 (2018) (“NPRM”).

to 5G; and (2) seamlessly protect incumbent users during and after the transition of uses in the band.

I. THE COMMISSION SHOULD LEVERAGE SPECTRUM SHARING TECHNOLOGIES TO FACILITATE EXPEDITIOUS ACCESS TO 3.7-4.2 GHZ SPECTRUM FOR 5G SERVICES AND ENSURE THAT IMPORTANT INCUMBENT OPERATIONS ARE PROTECTED THROUGHOUT THE TRANSITION OF THE BAND.

As Federated Wireless has previously explained, shared spectrum technologies, such as the Spectrum Access System (“SAS”) utilized in the Citizens Broadband Radio Service (“CBRS”), can manage both disparate uses of the 3.7-4.2 GHz band in the near term, and transition of the band to flexible use over the longer term, all while minimizing interference and protecting important incumbent operations.² It is advantageous that the 3.7-4.2 GHz band is adjacent to the CBRS band in which SAS technology soon will be deployed. Employing spectrum sharing through a SAS, or otherwise, during the transition of the 3.7-4.2 GHz band to flexible use will serve the Commission’s “joint goals of making spectrum available for new wireless uses while balancing desired speed to the market, efficiency of use, and effectively accommodating incumbent Fixed Satellite Service [] and Fixed Service [] operations in the band.”³

Even after completion of the 3.7-4.2 GHz transition, utilizing dynamic spectrum sharing in the band will provide licensees the flexibility and efficiency needed to manage their spectrum to suit their business needs, automatically account for agreed upon protection zones, and facilitate secondary markets transactions. Dynamic spectrum sharing serves the Commission’s primary objectives in repurposing the 3.7-4.2 GHz band, and should be utilized to ensure the

² See, e.g., Comments of Federated Wireless, Inc., GN Docket No. 17-183, at 9-11 (filed Oct. 2, 2017).

³ NPRM at ¶ 2.

efficiency of any mechanism used to repurpose the 3.7-4.2 GHz band, both during and after the transition.

A. Spectrum Sharing Will Enable Rapid Deployment of 3.7-4.2 GHz Spectrum Throughout a Transition to Newly Authorized Flexible Use.

Leveraging spectrum sharing technologies will ensure expeditious transitioning of portions of the 3.7-4.2 GHz band to flexible terrestrial use.⁴ By flexibly adapting to the changing spectral landscape during the transition, dynamic spectrum sharing technologies will make spectrum available as soon as incumbent sites transition out of the band.

A database administrator could manage band usage to assign new spectrum users across the 3.7-4.2 GHz band when and where the spectrum becomes available. Real-time coordination among satellite use, fixed links, and mobile operations would take place seamlessly to enable interference-free operation for all users and could be initiated with very short lead time. The strength of dynamic spectrum sharing lies in its ability to adapt quickly: as the transition progresses, and more spectrum is cleared, incumbent protection parameters can be changed easily to facilitate rapid spectrum access in newly cleared geographic areas and portions of the band. This capability, made possible through simple updates to software code, will allow flexible use operations to commence rapidly during the transition, in real-time, avoiding delays associated with waiting for a “critical mass” of spectrum to be cleared before ramping up new flexible use operations.⁵

This responsiveness to changes in the spectral landscape and ability to provide spectrum access in near real-time stands in stark contrast to the lengthy timelines associated with legacy approaches to reallocating spectrum for wireless use. As Federated Wireless and others have

⁴ *Id.* at ¶ 58.

⁵ *Id.* at ¶ 92.

previously noted, such legacy approaches lead to years-long delays in spectrum availability, with some reallocations taking as long as 18 years from the time of an initial Commission order to first commercial deployment.⁶ The United States cannot afford such lengthy delays in bringing this crucial mid-band spectrum to market. Mid-band spectrum, including the 3.7-4.2 GHz band, has been identified as critical to the deployment of 5G services, and countries and international organizations around the world are working tirelessly to be the first to deploy this spectrum in the race to 5G. In fact, the United Kingdom, Ireland, Spain, Italy, and South Korea have all auctioned spectrum in the 3.4-3.8 GHz range for 5G use in recent months, and commercial 5G deployments in the 3.5 GHz band have been announced in the United Arab Emirates, Saudi Arabia, and Qatar.⁷ In light of the intense global interest in making mid-band spectrum available for 5G services, the Commission must employ all tools at its disposal to ensure continued U.S. leadership in the race to 5G, including the capability of spectrum sharing technologies to enable access as rapidly as possible to the 3.7-4.2 GHz band. It is fortuitous in the United States that spectrum sharing technology can be rapidly deployed at 3.7-4.2 GHz, because of robust testing and development of SAS technology in the adjacent CBRS band.

⁶ See, e.g., Joint Comments of Intelsat License LLC and Intel Corporation, GN Docket No. 17-183, at 12 (filed Oct. 2, 2017) (citing CTIA, *Fostering 21st Century Wireless Connectivity: Key Spectrum & Infrastructure Issues for Policymakers*, at 4 (Jan. 12, 2017); Thomas K. Sawanobori, CTIA, *From Proposal to Deployment: The History of Spectrum Allocation Timelines*, at 2 (2015) (“A review of previous allocation efforts shows that it takes, on average, 13 years to reallocate spectrum for wireless use.”)).

⁷ See, e.g., Sacha Kavanagh, “5G UK auction” (June 11, 2018), available at <https://5g.co.uk/guides/5g-uk-auction/>; Majithia, Kavitha, Mobile World Live, “Middle East Giants Jostle for 5G-First Status” (May 15, 2018), available at <https://www.mobileworldlive.com/featured-content/home-banner/middle-east-giants-jostle-for-5g-first-status/>.

B. Dynamic Spectrum Sharing Technologies Will Seamlessly Protect Incumbent Operations During and After a Transition to Flexible Use.

In addition to hastening the speed at which flexible use operations can commence in the 3.7-4.2 GHz band, both during and after a transition, dynamic spectrum sharing is the best method to “ensure that protected incumbent earth stations are indeed protected.”⁸ The robust protections offered by dynamic spectrum sharing allow high-value FSS services to remain protected without disruption to their current operations.⁹

The operational characteristics of FSS incumbent uses in the 3.7-4.2 GHz band are well known, and dynamic spectrum sharing technologies were developed for the CBRS band to protect these types of operations and are readily available. In the CBRS, incumbent FSS users operate in the extended C-band in the same manner in which they operate in the conventional C-band at 3.7-4.2 GHz. To provide these incumbent FSS users the necessary protection, the Commission thoroughly evaluated and determined the protection criteria needed to enable flexible co-channel terrestrial use of C-band FSS spectrum. To enforce these protections, the CBRS service relies on the SAS’s dynamic frequency assignment and interference modeling capabilities to protect FSS users while enabling dense use of the band by others.

The FSS earth station interference protection criteria, and the SAS’s enforcement of those requirements, are readily transportable to the 3.7-4.2 GHz band. The ability for dynamic spectrum sharing to protect incumbent operations has been under testing and evaluation by the Commission for many years, with initial commercial deployment of CBRS systems imminent.¹⁰

⁸ NPRM at ¶ 88.

⁹ *Id.* at ¶ 64.

¹⁰ See *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 July 27, 2018).

The SAS creates protection zones targeted to an incumbent’s actual needs, rather than utilizing a one-size-fits-all approach to protecting FSS sites premised on worst-case assumptions. Before adoption of the CBRS rules, the Commission previously required 150-kilometer protection zones around FSS sites in the extended C-band, prohibiting wireless operations in those protection zones unless first coordinated with the FSS licensee.¹¹ Today, the Commission has found those old FSS protection zones “excessively large, overly simplistic, and inefficient *given the capabilities of SASs to predict realistic path loss.*”¹² In the absence of leveraging SAS capabilities, as the Commission has done for the CBRS band, any mechanism for transitioning the 3.7-4.2 GHz band to flexible use will likely require reliance on the old, “excessively large” and “inefficient” FSS protection zones. In view of the fact that the 3.7-4.2 GHz band is encumbered by thousands of incumbent FSS sites, this would leave little to no spectrum for flexible use until the band-clearing process has been substantially completed, significantly delaying use of this crucial mid-band 5G spectrum.

In contrast, no modifications to the SAS-administered FSS protections in the CBRS band are needed to facilitate flexible terrestrial use of the 3.7-4.2 GHz band. SAS systems would simply need access to the IBFS database records, or a similar database, with the necessary technical information for incumbent FSS systems, in order to obtain “the geographic locations and configuration of protected FSS locations” operating at 3.7-4.2 GHz,¹³ and enforce the Commission’s FSS protections accordingly. Without question, the Commission should leverage

¹¹ 47 C.F.R. § 90.1331.

¹² See *Amendment of the Commission’s Rules with Regard to Commercial Operations in the 3550-3650 MHz Band*, GN Docket No. 12-354, Report and Order and Second Further Notice of Proposed Rulemaking, FCC 15-47, at ¶ 288 (2015) (emphasis added).

¹³ 47 C.F.R. § 96.55(a).

dynamic spectrum sharing technologies to accelerate the availability of the 3.7-4.2 GHz band for flexible use.

II. CONCLUSION.

Federated Wireless applauds the Commission for its efforts to ensure new spectrum resources are committed to the development of 5G services. The Commission should leverage available spectrum sharing technologies in the 3.7-4.2 GHz band to rapidly facilitate transition of the 3.7-4.2 GHz band, appropriately protect incumbent operations, and enable deployment of new services at 3.7-4.2 GHz that will facilitate U.S. leadership in the global race to 5G.

Respectfully submitted,

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