



4075 Wilson Blvd 9th floor
Arlington, VA 22203

support@federatedwireless.com
+17036500585

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National Telecommunications and Information Administration (NTIA)
U.S. Department of Commerce
1401 Constitution Avenue, NW
Washington, DC 20230

Re: An Analysis of Aggregate CBRS SAS Data from April 2021 to January 2023; NTIA Report 23-567

Dear NTIA -

Federated Wireless, Inc. (“Federated Wireless”), the industry leader in the development and deployment of commercial dynamic spectrum management solutions (“DSMS”),¹ offers these comments in response to the request for feedback on the NTIA Technical Report, “An Analysis of Aggregate CBRS SAS Data from April 2021 to January 2023,” released May 1, 2023.²

Federated Wireless applauds NTIA and the Institute for Telecommunication Sciences (ITS) for their efforts to characterize the state and growth of the Citizens Broadband Radio Service (CBRS) and to quantify progress towards meeting the goals of “facilitate[ing] growth in wireless broadband devices, provid[ing] cost-effective wireless broadband access for rural communities, enhance[ing] economic competitiveness by creating new jobs and new businesses, increase [ing] productivity, spur[ring] innovation, and improv[ing] public safety.”³

We are proud of the CBRS industry’s achievements towards meeting these goals in its three and a half years of commercial service, with more than 339,000 CBRS devices deployed to date supporting both consumer-oriented services as well as a wide range of private wireless networks. The massive expansion of non-traditional network operators made possible by streamlined access to “carrier-grade” spectrum and equipment is reaching every aspect of the U.S. economy. From agriculture to automotive, manufacturing to media, energy, retail, commercial real estate, in addition to schools, libraries, and civil society groups, private wireless

¹ Federated Wireless is a certified Spectrum Access System (“SAS”) administrator for the Citizens Broadband Radio Service (“CBRS”) band and a conditionally approved Automated Frequency Coordination (“AFC”) system operator for the 6 GHz band.

² National Telecommunications and Information Administration, U.S. Department of Commerce, “An Analysis of Aggregate CBRS SAS Data from April 2021 to January 2023” *available at* <https://ntia.gov/report/2023/analysis-aggregate-cbrs-sas-data-april-2021-january-2023> (NTIA Technical Report).

networks are springing up as the result of the combination of easily available spectrum, lower cost equipment, and tailor-made solutions from multiple vendors.

The NTIA Technical Report analysis supports the conclusion there is strong, growing demand for high-speed, low-latency capabilities by both traditional and non-traditional operators that are accessing spectrum in the General Authorized Access (GAA) tier.⁴ These entities need sufficient quantities of spectrum, as well as flexible and streamlined access options (e.g., unlicensed or license-by-rule) to achieve their specific objectives and accelerate growth of the U.S. economy. The CBRS licensing framework has provided this for them.

Moreover, with zero reports of interference from incumbent users, the CBRS experience has shown that we can meet federal users' spectrum requirements, offer non-federal users spectrum access options that meet their individual needs, maximize spectrum efficiency by all users, and increase cost-effective connectivity for all Americans.

Given the impressive CBRS track record, Federated Wireless recommends that NTIA focus on two key objectives: 1) leveraging DSMS technology and tools to optimize ongoing and future federal use of spectrum so that more federal spectrum can be shared with the commercial sector via innovative licensing frameworks, and 2) identifying and implementing adjustments to the CBRS processes to make the sharing experience in the CBRS band (and ultimately other bands) even more efficient.

1. Leveraging DSMS tools to manage federal use of spectrum

In order to accurately understand, model, and measure current as well as anticipated future use of spectrum, real-world measurements (not just modelling) should be used to progressively refine propagation models, use patterns, as well as interference to continually improve spectrum access and efficiency. Visibility into how intensively bands are being used will better enable us to identify opportunities for improving co-existence in the future.

API-enabled DSMS technology embedded with reporting mechanisms can be used for such real-world data gathering, measurement, and validation of actual use. Together with a regular heartbeat or check-in, a DSMS API can be leveraged to report interference, while measurement reports can provide the data and justification necessary to resolve interference incidents more quickly and automatically. API-enabled DSMS technology can also be utilized by incumbent federal users to dynamically reserve and release spectrum in real-time rather than reserving for longer periods of time than actually necessary.

By leveraging automated spectrum management technology to make more intensive sharing of spectrum among federal users, NTIA will have greater visibility into current

⁴ "On January 1, 2023, four out of five active CBSDs were GAA-only, 85% of the active grants were GAA, and two-thirds of active CBSDs with a PAL grant had at least one active GAA grant." NTIA Technical Report at xi.

uses and future needs, make the process of sharing with the commercial sector less burdensome, spur fundamental product research and development that can be ported to the commercial sector, and ensure a more coordinated and comprehensive approach to federal spectrum management.

2. Optimizing the CBRS (and future DSMS) sharing processes

Additional research and development may provide opportunities to improve upon existing DSMS implementations, such as the CBRS Spectrum Access System (SAS), so that even greater spectrum efficiency can be achieved.

For example, today, the SAS manages commercial access to the band by listening for naval radar operations via a network of sensors, an online scheduling portal, or through static exclusion zones. In many cases, commercial operations can be interrupted for longer periods of time or over larger geographic areas than necessary to protect actual incumbent use.

To address these challenges, we support NTIA's efforts to develop an Incumbent Informing Capability (IIC), which could complement and/or improve upon existing incumbent notification approaches. To ensure that the ICC is a meaningful improvement upon existing notification methods, we recommend reliance on automation as a key component. The goal of the IIC should be to eliminate to the greatest extent possible human involvement in the notification process. Incorporating cloud-computing and automation together with local sensing capabilities, for example, could greatly increase efficiency. Together with secure, federally controlled information flow, automation would also help avoid disruptions to ongoing federal missions or the need to retrain key federal personnel in the field. Our experience in working with DoD and NTIA on current notification methods for the CBRS band leads us to believe similar collaboration between industry and government could accelerate development of the IIC and achieve scalable solutions that increase spectrum efficiency.

Additionally, the use of newer propagation models than those currently used by the SAS would enable increased access to CBRS spectrum by commercial users while still providing sufficient protection for incumbent operations. Use of propagation models that account for clutter, for example, will present a more realistic picture of the actual RF environment and will enable both protection of incumbent systems and maximization of spectrum efficiency.

Routine assessment of current spectrum sharing processes and the opportunity for adjustments will ensure that we are leveraging lessons learned and taking advantage of ongoing innovation. The Interagency Joint Working Group (IJWG) that was formed to facilitate discussion between incumbent DoD users and the CBRS SAS administrators has proven to be an effective forum for detailed technical discussions on spectrum coordination, compatibility, and interference protection mechanisms improvements for

the CBRS band. The IJWG should be empowered and encouraged to implement enhancements to the CBRS sharing framework on a timely basis.

In addition to routine assessment and implementation of refinements to spectrum sharing processes, we recommend that NTIA involve a wide range of spectrum-reliant stakeholders in its long-term spectrum planning. This list should include the traditional public mobile network operators, WISPs, and other consumer-oriented service providers, along with the technology and equipment vendors that support them. But importantly, it should also include a broad swath of companies and organizations representing the “5G economy,” including private wireless network users and developers of industrial automation, artificial intelligence, and edge computing as we look to spur innovation and advanced industrial practices.

Conclusion

The CBRS experience has shown that we can meet federal users’ spectrum requirements, offer non-federal users spectrum access options that meet their individual needs, maximize spectrum efficiency by all users, and increase cost-effective connectivity for all Americans. We should build upon the successes of the CBRS dynamic sharing framework and identify opportunities to iterate and improve. We should also encourage efficient spectrum usage by all users, be they federal or non-federal, by leveraging automated spectrum management and machine learning technologies to enable greater visibility into current uses and future needs and lead to a more coordinated and comprehensive approach to spectrum management.

We stand ready to assist NTIA to ensure both federal and non-federal users have sufficient access to spectrum now and in the future, maximize spectrum access options for the widest and most diverse group of users, and foster innovation that will drive U.S. economic growth and leadership.

Respectfully submitted,

/s/ Jennifer M. McCarthy
Jennifer M. McCarthy
Vice President, Legal Advocacy
Federated Wireless, Inc.
4075 Wilson Boulevard
9th Floor
Arlington, VA 22203
jmccarthy@federatedwireless.com