

**Before the
NATIONAL TELECOMMUNICATIONS AND INFORMATION ADMINISTRATION
U.S. DEPARTMENT OF COMMERCE**

Washington, D.C. 20230

An Analysis of Aggregate CBRS SAS Data
from April 2021 to January 2023

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NTIA Report 23-567

**COMMENTS OF
NCTA — THE INTERNET & TELEVISION ASSOCIATION**

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INTRODUCTION AND SUMMARY

NCTA applauds the National Telecommunications and Information Administration (NTIA) for developing “An Analysis of Aggregate CBRS SAS Data from April 2021 to January 2023” (NTIA CBRS Report or Report)¹ and, as part of this effort, seeking feedback from stakeholders on the observations and conclusions in the Report and on ways to enhance the CBRS sharing framework. The Report demonstrates the success of the 3.5 GHz band Citizens Broadband Radio Service (CBRS) framework in advancing NTIA’s goals: facilitating growth in wireless broadband devices, providing cost-effective wireless broadband access for rural communities, enhancing economic competitiveness by creating new jobs and new businesses, increasing productivity, spurring innovation, and improving public safety.²

The Report comes at a pivotal time, as policymakers consider ways to maximize the spectral efficiency of already-congested airwaves and as NTIA is developing a National Spectrum Strategy. As NCTA explained in its Comments on the National Spectrum Strategy,³ and as Administrator Alan Davidson reinforced during his May 23, 2023, testimony before the House Committee on Energy and Commerce, policymakers should execute an all-of-the-above approach to spectrum use by supporting commercial operations through licensed-exclusive, licensed-shared, and unlicensed access. This approach not only enables access for a diverse set of users, which fosters innovation and competition, but also allows for coexistence opportunities between Federal and non-Federal users.

¹ Douglas Boulware et al., *An Analysis of Aggregate CBRS SAS Data from April 2021 to January 2023*, NTIA Report 23-567, May 2023 (*NTIA CBRS Report*).

² *NTIA CBRS Report* at xi.

³ Comments of NCTA – The Internet and Television Association, NTIA–2023–0003 (filed April 17, 2023).

The Report demonstrates that commercial wireless broadband users are making robust use of the CBRS band and spectrum sharing in the band has been successfully enabled. The CBRS framework provides commercial users the certainty of Priority Access Licenses (PALs), while also allowing opportunistic use of bandwidth not in use via the General Authorized Access (GAA) tier. The CBRS framework also features county-sized license areas, and lower power levels, which optimize efficient spectrum re-use and sharing. Each of these factors has contributed to the success of CBRS in drawing an incredibly diverse array of users, including manufacturers, educational institutions, local governments, energy and utility companies, as well as commercial wireless providers of all types – nationwide, regional, and new entrants.

NCTA member companies are using the CBRS band to deploy next-generation wireless networks, bring new competition to a heavily concentrated wireless marketplace, and extend the reach of their high-speed broadband networks. Charter, Comcast, and Cox were three of the top five winning bidders in the Federal Communications Commission's (Commission or FCC) CBRS auction, and along with other NCTA members, are using their PAL licenses to help meet the growing demand for wireless connectivity. NCTA members also are utilizing the GAA tier to provide mobile and fixed wireless broadband services.

CBRS has proven successful not only in supporting commercial wireless broadband uses, but also in ensuring protection of critical national security interests by prioritizing Federal incumbent users. As the Report reinforces, licensed-shared frameworks can maximize efficient spectrum use while promoting coexistence opportunities between federal and non-federal users. There has been no reported instance of harmful interference to protected incumbents in the CBRS band, and NTIA should continue to build upon this success.

NTIA’S REPORT DEMONSTRATES THAT DYNAMIC SPECTRUM ACCESS SUPPORTS MEANINGFUL COMMERCIAL USE WHILE PROTECTING INCUMBENTS.

A. The CBRS Framework Has Enabled Wireless Broadband Growth, Competition, and Access in Rural Areas.

The CBRS band has enabled the wireless broadband growth the FCC envisioned in adopting the licensed-shared framework, as evidenced by the Institute for Telecommunications Sciences (ITS) research summarized in the Report. A diverse range of users increasingly rely on CBRS spectrum. The total number of active grants for Citizens Broadband Service Devices (CBSDs) grew quarterly by 12 percent during the 21-month period analyzed in the Report,⁴ and on January 1, 2023, 78.1 percent of counties nationwide had at least one active CBSD, up from 56.4 percent on April 1, 2021.⁵ (See Image 1, below) The NTIA CBRS Report also reflects this rapid growth: as of January 1, 2023, there were 287,033 active CBSDs nationwide. And OnGo Alliance reports that as of March 2023, over 300,000 CBSDs had been deployed.⁶ By comparison, the commercial wireless industry has built 418,887 cell sites (macro- and small-cell) *over its entire 40-year history.*⁷ (See Image 2, below)

⁴ *NTIA CBRS Report* at 53.

⁵ *Id.*

⁶ See OnGo Alliance, *CBRS Adoption Continues to Accelerate* (2023), https://ongoalliance.org/wp-content/uploads/2023/03/OnGo_CBRS-Adoption-Continues-to-Accelerate.pdf.

⁷ CTIA, *2022 Annual Survey Highlights* (Sep. 13, 2022), <https://api.ctia.org/wp-content/uploads/2022/09/2022-Annual-Survey.pdf>.

Image 1. Percentage of Counties with at Least One Active CBSD over 21-Month Period

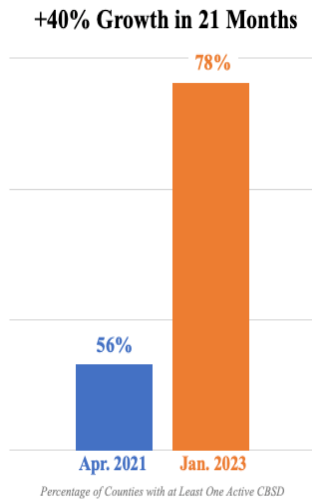
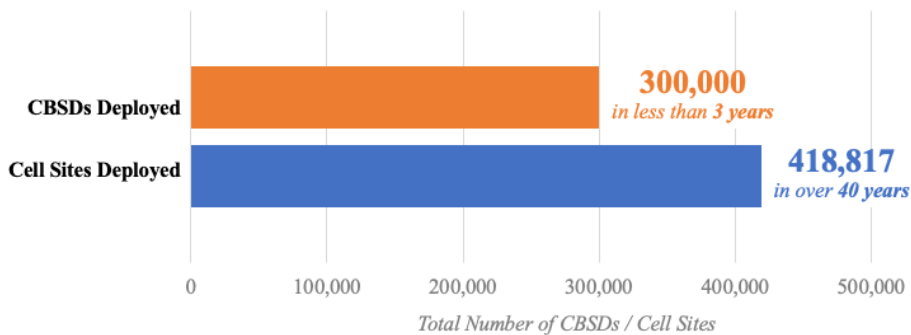


Image 2. Total Number of CBSDs / Cell Sites Deployed



Both PAL and GAA grants have increased, and demand for CBRS spectrum is growing. The band’s unique tiered-access framework has allowed users to tailor their spectrum use to their individual deployment needs. For example, traditional and non-traditional spectrum users increasingly demand the low-barrier to spectrum access that the GAA tier offers.⁸ In making

⁸ See Commscope and Telrad, *CBRS Case Study* (2021), available at https://telrad.com/wp-content/uploads/2021/08/IGL_Commscope_Telrad_Case_Study_2021.pdf; Howard Buskirk, *Las Vegas Keeps Finding New Uses for Private CBRS Network*, *Communications Daily* (May 24, 2023), Available from <https://communicationsdaily.com/article/2023/05/24/las-vegas-keeps-finding-new-uses-for-private-cbrs-network-2305230055>; Bevin Fletcher, *JMA Wireless, AWS complete private CBRS network for Carnegie Mellon lab*, *Fierce Wireless* (Sep. 2, 2021), <https://www.fiercewireless.com/private-wireless/jma-wireless-aws-complete-private-cbrs-network-for-carnegie-mellon>.

separate channels available for use when the Department of Defense (DoD) is not operating, the GAA tier enhances spectral efficiency.⁹ The ability to access CBRS spectrum through more flexible mechanisms benefits a wide range of industries and organizations, manufacturing, automotive, agriculture, energy, retail, commercial real estate, communications, media, and supply chain industries, as well as schools, libraries, and civil society groups, all of which utilize CBRS spectrum without the need to contract with a nationwide carrier.¹⁰ CBRS spectrum is also useful for larger carriers. Verizon was the largest CBRS auction winner, spending \$1.9 billion to acquire licenses, and the FCC's recent Communications Marketplace Report observes that in one market, Verizon's median download speed using CBRS is over twice as fast as its non-CBRS download speed.¹¹

PALs also play an important role in the CBRS ecosystem by enabling prioritized access to spectrum (while allowing GAA use of PAL spectrum when not used by the licensee). Although access to GAA spectrum could be obtained immediately after the Commission finalized the CBRS rules,¹² PAL spectrum did not become available until licenses were issued in 2021, while ITS research was ongoing. Given that licensees can now access CBRS spectrum, PAL use is certain to increase, which will promote economies of scale and more intensive use of CBRS spectrum.

⁹ Four out of five active CBSDs were GAA-only, 85% of the active grants were GAA, and 66.7% of the 56,529 CBSDs with a PAL also had at least one active GAA grant. *NTIA CBRS Report* at xi.

¹⁰ See Letter to Jessica Rosenworcel, Chairwoman, FCC and Alan Davidson, Assistant Secretary and Administrator, NTIA from Airspan Networks et al. (Nov. 17, 2022), *Available at* [https://urldefense.com/v3/_https://alair.ala.org/handle/11213/19223_!!O6UFbZt64g!J3DYeGL7yKrGC-H_UgwL_ID9DXYEe0masGZ8tNFtXMYewIt49QkqQT0Vkh7vDiO1mj-EbST1Cuetag\\$](https://urldefense.com/v3/_https://alair.ala.org/handle/11213/19223_!!O6UFbZt64g!J3DYeGL7yKrGC-H_UgwL_ID9DXYEe0masGZ8tNFtXMYewIt49QkqQT0Vkh7vDiO1mj-EbST1Cuetag$).

¹¹ *Communications Marketplace Report*, GN Docket No. 22-203, 2022 Communications Marketplace Report, FCC 22-103, ¶ 88 (Rel. Dec. 30, 2022).

¹² *Promoting Investment in the 3550-3700 MHz Band*, GN Docket No. 17-258, Report and Order, FCC 18-149 (rel. Oct.24, 2018) (2018 R&O).

The CBRS framework has enabled the deployment of robust services to unserved and underserved areas by facilitating smaller and non-traditional providers' use of the band through dynamic spectrum access, county-size licenses, and lower power levels. These attributes provide flexibility and permit all different types of entities access to licenses, which historically have been cost-prohibitive to all but a few nationwide providers.¹³ The NTIA CBRS Report underscores this success: more than 70 percent of all active CBSDs were deployed in rural census blocks on January 1, 2023.¹⁴ CBRS is a cost-effective and efficient way for operators to deliver high-speed Internet access and enhanced services to the rural locations that need it most and have often been left behind by traditional spectrum access regimes.

B. The CBRS Framework Can Be Adapted for Additional Coexistence Opportunities and Further Enhanced.

Given the incredible success of CBRS, as highlighted in the Report, the CBRS framework should serve as the foundation for additional coexistence opportunities between commercial wireless broadband services and Federal incumbents. As consumer and industrial connectivity demands intensify, and as federal users continue to rely on vital frequencies to power our national defense and other critical operations, U.S. spectrum resources are becoming increasingly scarce. With almost no greenfield spectrum remaining, it is critical that federal lawmakers and agencies leverage shared-licensed frameworks to meet the long-term needs of federal and non-federal users alike. The CBRS framework successfully promotes the efficient

¹³ The CBRS auction resulted in 228 winning bidders, which is almost ten times the number of winning bidders in the more traditional high-powered 3.45 GHz band auction held the following year. *Auction of Priority Access Licenses in the 3550-3650 MHz Band Closes; Winning Bidders Announced for Auction 105*, AU Docket No. 19-244, Public Notice, 35 FCC Rcd. 9287 (2020); *Auction of Flexible-Use Service Licenses in the 3.45-3.55 GHz Band Closes; Winning Bidders Announced for Auction 110*, AU Docket No. 21-62, Public Notice, 37 FCC Rcd. 308 (2022).

¹⁴ *NTIA CBRS Report* at xi.

use of spectrum and enables new entrants, while avoiding the delay, expense, and disruption associated with clearing incumbent users from the band.

A CBRS-like dynamic sharing framework should be adapted to other bands, including the 350 megahertz of critical mid-band spectrum from 3.1 to 3.45 GHz (the 3.1 GHz band). Like the CBRS band, the 3.1 GHz band is used primarily by Federal incumbents, including DoD. A licensed-shared approach would not only enable faster deployment of commercial wireless services than a clear-and-relocate approach, but it also would account for important federal equities. The highly automated CBRS Spectrum Access System (SAS) predicts the interference threshold of CBSDs, which allows it to manage commercial operations so they do not cause interference to Federal incumbents.¹⁵ Due in part to this technology, there have been no reported instances of interference from CBRS operations to protected incumbents in the band.¹⁶ A similar framework could be utilized to protect mission-critical national security operations in the 3.1 GHz band.

NCTA encourages all stakeholders, including regulators, CBRS users, equipment manufacturers, SAS Administrators, and industry associations developing standards and guidelines, to continually consider how the CBRS framework can enable more extensive coexistence among commercial users and between federal and non-federal users. Indeed, CBRS's ability to evolve is inherent in the framework. In adopting the *3.5 GHz Order*, the Commission encouraged CBRS users and manufacturers to address technical issues and consider ways to improve performance. Industry has responded, evaluating solutions for denser

¹⁵ *NTIA CBRS Report* at 3.

¹⁶ FCC Technological Advisory Council, *Recommendations to the Federal Communications Commission Based on Lessons Learned from CBRS*, 2 (2022), https://www.fcc.gov/sites/default/files/recommendations_to_the_federal_communications_commission_based_on_lessons_learned_from_cbrc.pdf (*TAC CBRS Report*).

deployment of CBSDs closer to federal incumbent users and ways to improve communication between CBSDs and SASs. For example, in 2018, an industry-led group, the WinnForum, established baseline standards for the CBRS band, and further enhancements have since been released. The OnGo Alliance, an industry consortium of over 160 entities working to accelerate the buildout of effective and efficient CBRS networks, also has established a product certification program for CBRS band equipment to ensure multi-vendor interoperability.

As technology improves and federal and commercial users continue to gain experience and trust in coexistence, they should incorporate advancements into both the CBRS framework and future dynamic sharing regimes to further optimize the efficient use of spectrum. In this regard, NCTA supports the FCC's Technological Advisory Council (TAC) Advanced Spectrum Sharing Working Group's recommendations to improve the utility of future shared bands, some of which also could be applied to the CBRS band.¹⁷ For example, the use of advanced propagation models in coexistence analyses would reduce spectrum waste in shared bands, including CBRS. The mechanism for protecting federal incumbents in the CBRS band has evolved through collaboration among the FCC, NTIA, DoD, and industry stakeholders, resulting in the adoption of Dynamic Protection Areas (DPAs) in place of the Exclusion Zones originally adopted by the Commission.¹⁸ However, propagation models currently used to determine DPAs do not account for attenuation due to clutter, resulting in estimates of path loss and predicted interference that can be overly conservative.¹⁹ Incorporation of high-definition representations of terrain would enable CBRS propagation models to more accurately assess clutter and more

¹⁷ See generally *TAC CBRS Report*.

¹⁸ See generally *Promoting Investment in the 3550-3700 MHz Band*, GN Docket No. 17-258, Order, 33 FCC Rcd. 4987 (2018).

¹⁹ See *TAC CBRS Report* at 2-3.

precisely define DPAs, thereby facilitating even more efficient use of the CBRS band without compromising federal incumbent protections.²⁰

CONCLUSION

NCTA commends NTIA and ITS for their efforts in preparing the NTIA CBRS Report and appreciates the opportunity to comment. As the Report makes clear, the CBRS band is fueling innovation, improving wireless coverage, reducing network costs, and serving consumers effectively – especially in rural and underserved areas – all without displacing incumbent federal users. NCTA encourages stakeholders to build on this success through collaboration to maximize efficient use of scarce spectrum resources. The CBRS band should serve as a blueprint as policymakers consider ways to enable commercial services in other bands, cementing U.S. leadership in innovation and technology.

Respectfully submitted,

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²⁰ *See Id.* Among other recommendations, the TAC Advanced Spectrum Sharing Working Group found that the FCC, in designing requirements for future shared bands, should explore alternatives to (1) exhaustive computation of aggregate interference for interference protection assessments, which slows the process of assigning available spectrum and (2) use of the Environmental Sensing Capability and any similar means of detecting incumbent activity solely via networks of dedicated sensors, which can limit deployment. *Id.* at 2-5. The recommendations also warrant consideration in the context of the CBRS band.