May 31, 2023

Via E-Mail

Mr. Charles Cooper
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Re: *CTIA Response to NTIA Report, An Analysis of Aggregate Citizens Broadband Radio Service ("CBRS") Spectrum Access System ("SAS") Data from April 2021 to January 2023*

Dear Mr. Cooper:

CTIA appreciates that the National Telecommunications and Information Administration ("NTIA") is seeking to quantify commercial use of the CBRS band at 3550-3700 MHz and assess the utility of the CBRS framework.[1] CBRS is a 150-megahertz swath of prime mid-band spectrum that is licensed for 5G elsewhere around the globe, but here in the U.S. it is dedicated to a novel spectrum access framework. As CTIA has highlighted previously, the preemptible, low-power CBRS framework has resulted in under-utilization of this valuable spectrum resource.[2] The data contained in NTIA's recent Analysis of Aggregate CBRS SAS Data (the "CBRS Data Report") do not demonstrate otherwise. Neither the CBRS Data Report nor other available data support a finding that the CBRS framework is achieving NTIA's stated goals for CBRS, including facilitating broadband access in rural areas or spurring innovation or economic competitiveness. CTIA offers suggestions below on ways NTIA could obtain more meaningful data to assess CBRS utilization.

As an initial matter, key findings of the CBRS Data Report overstate CBRS service and coverage. The CBRS Data Report utilizes an abandoned methodology for quantifying spectrum usage and coverage—namely, suggesting that the population in a geographic area is served if a

[1] *See* Douglas Boulware et al., *An Analysis of Aggregate CBRS SAS Data from April 2021 to January 2023*, NTIA Technical Report 23-567, NTIA (May 2023), https://its.ntia.gov/umbraco/surface/download/publication?reportNumber=TR-23-567.pdf ("CBRS Data Report").

[2] *See* Comments of CTIA, Docket No. NTIA-2023-0003, at 28-30 (filed Apr. 17, 2023) ("CTIA National Spectrum Strategy Comments").

single site is active in that area. Congress and the Federal Communications Commission ("FCC") have deemed this methodology unreliable in assessing broadband availability and instead require more granular service area maps to show coverage. The notion that a substantial majority of the U.S. population, particularly rural Americans, benefits from CBRS deployments is not supported by the data in the report.[3] NTIA can refine its assessment of CBRS utilization by relying on more accurate methodologies, as both it and the FCC have done in other contexts.

Second, the assessment overstates the impact of the CBRS framework on rural broadband and new competition. While the CBRS Data Report leans on Wireless Internet Service Provider ("WISP") deployments as a sign of expanded rural coverage, the evidence suggests otherwise: perhaps half of the CBRS devices ("CBSDs") active in the band could be legacy WISP stations and attaching customer premises equipment that operated in a portion of the CBRS band prior to adoption of the CBRS framework and have since transitioned to CBRS Part 96-compliant status. These WISP devices now qualify as CBSDs, but they are legacy broadband devices, not any new expansion of rural broadband connectivity resulting from the CBRS framework. We urge NTIA to take this factor into account as it seeks a more data-driven analysis.

Third, the analysis overstates the success of the CBRS framework in promoting innovation. The data show that more than 96 percent of all CBRS deployments are outdoor, Category B CBSDs that are largely used to facilitate more traditional broadband deployments. Conversely, less than four percent of CBSDs are the lower powered, indoor Category A devices—which were targeted for innovative uses such as pioneering private wireless networks. Moreover, a substantial majority of outdoor CBRS deployments are authorized at the highest possible power, suggesting that these broadband offerings could be covered more effectively with higher power rules. In the Priority Access License ("PAL") category, it is apparent that auction winners are largely using the band to augment other wide-area licensed spectrum or some cable provider PAL licensees are delaying deployment altogether and relying on traditional, full-power licensed frequencies to facilitate broader access and deployment.[4] NTIA can bolster its analysis by examining these factors more closely.

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[3] *The innovative spectrum sharing framework connecting Americans across the country*, NTIA Blog (May 1, 2023), https://ntia.gov/blog/2023/innovative-spectrum-sharing-framework-connecting-americans-across-country ("NTIA CBRS Data Report Blog") ("More than 70 percent of all active devices are deployed in rural census blocks, showing the band is playing a significant role in expanding rural wireless connectivity.").

[4] *See* Jeff Baumgartner, *Charter will deploy CBRS widely, but it's in no rush*, LIGHT READING (May 18, 2023), https://www.lightreading.com/cable-tech/charter-will-deploy-cbrs-widely-but-its-in-no-rush-/d/d-

Looking back at the order adopting the CBRS model, the FCC explained that the low-power, three-tiered access framework for CBRS would serve as an experiment in spectrum policy.[5] The results of that experiment thus far reflect under-utilization.[6]

CTIA offers these insights specifically in response to NTIA's request for input on how the CBRS sharing framework could be improved.[7] To be sure, we believe there are inherent flaws in the CBRS framework, as it is a preemptible service that inevitably results in unpredictability as to the quality of service offered. Further, the lower power levels adopted for the CBRS band have restricted and limited the use of the spectrum, relegating what could have been a globally harmonized band that supports nationwide coverage to a band that serves predominantly to augment capacity for wide-area uses that utilize other existing spectrum bands. While we support further utilization analysis by NTIA, these fundamental characteristics of CBRS will continue to restrict that utilization.

Nevertheless, as NTIA further evaluates the CBRS band, CTIA urges it to utilize methods to obtain more meaningful data, for example by releasing more granular information from the SAS Administrators that provided the data for the CBRS Data Report and using it to map coverage or by deploying a quantitative frequency assessment methodology NTIA has used elsewhere. We commend the Biden Administration's commitment to evidence-based policymaking and encourage NTIA to apply sound methodology to CBRS utilization before making any findings regarding its success or further considering use of the experimental framework in other frequency bands.

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id/784953 (discussing Charter Communications' reliance on its mobile virtual network operator agreement, which the company explained "reduced some of the incentive to go hard and fast" to deploy CBRS).

[5] *See, e.g.*, *Amendment of the Commission's Rules with Regard to Commercial Operations in the 3550-3650 MHz Band*, Report and Order and Second Further Notice of Proposed Rulemaking, 30 FCC Rcd 3959 ¶ 2 (2015) ("2015 CBRS Order").

[6] *CBRS: An Unproven Spectrum Sharing Framework*, RECON ANALYTICS, at 3-5 (Nov. 14, 2022), https://www.ctia.org/news/cbrs-an-unproven-spectrum-sharing-framework ("Recon Analytics CBRS Report"); *CBRS Spectrum Occupancy Measurements*, CTIA (Jan. 28, 2022), https://www.ctia.org/news/cbrs-spectrum-occupancy-measurements ("CBRS Spectrum Occupancy Measurements").

[7] NTIA CBRS Data Report Blog ("NTIA would like feedback on the report from stakeholders, including observations and conclusions, how future reports may be improved, and on ways to improve the CBRS spectrum sharing framework.").

A. The CBRS Data Report's Analytical Approach to CBRS Usage is Inconsistent with Other Government Assessments of Broadband Availability and Spectrum Use.

Congress, the FCC, and NTIA have paid considerable attention to ensuring accurate information is available about broadband availability. The approach taken in the CBRS Data Report can be improved by accounting for the recent reforms in the methodology applied to assess broadband availability and with broader agency assessments of spectrum use.

For years, the FCC required fixed broadband providers to report the census blocks in which their services were available, with "availability" defined as areas where the provider does or easily could provide broadband service at specified advertised speeds.[8] In its 2019 Digital Opportunity Data Collection Order, the FCC found that this methodology was "not sufficient to . . . support[] the imperative of [its] broadband-deployment policy goals."[9] In adopting new rules, the FCC moved away from a methodology that focused on the potential to provide service to a point within the census block, and instead determined that broadband availability would be derived from granular maps of the areas where providers have broadband-capable networks and make service available.[10] Congress largely confirmed the FCC's updated approach in the 2020 Broadband Deployment Accuracy and Technological Availability Act ("Broadband DATA Act"), expressing concern that "a provider can report that a census block is served if it provides broadband service in any part of that census block, regardless of how many consumers in the census block are not able to access the service."[11] This resulted, Congress found, in "many areas of the country (especially in rural areas) that are reported as having broadband service, when in fact, they may not."[12] Lawmakers and policymakers thus specifically required more granular data

[8] *Establishing the Digital Opportunity Data Collection et al.*, Report and Order and Second Further Notice of Proposed Rulemaking, 34 FCC Rcd 7505 ¶ 6 (2019) ("DODC Order"); *see also Establishing the Digital Opportunity Data Collection et al.*, Second Report and Order and Third Further Notice of Proposed Rulemaking, 35 FCC Rcd 7460 (2020) ("DODC Second Order"); *Establishing the Digital Opportunity Data Collection et al.*, Third Report and Order, 36 FCC Rcd 1126 (2021).

[9] DODC Order ¶ 5.

[10] *Id.* ¶ 2.

[11] SENATE COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION, BROADBAND DEPLOYMENT ACCURACY AND TECHNOLOGICAL AVAILABILITY ACT, S. REP. NO. 116-174, at 3 (2019), https://www.congress.gov/116/crpt/srpt174/CRPT-116srpt174.pdf; *see also* Broadband Deployment Accuracy and Technological Availability Act, Pub. L. No. 116-130, 134 Stat. 228 (2020) ("Broadband DATA Act").

[12] Broadband DATA Act Senate Report at 3.

collection such that a location could not be viewed as "served" by the existence of a single site that may or may not provide service to consumers.[13]

The CBRS Data Report, however, applies the more rudimentary methodology, highlighting the number of geographic areas that have at least one CBSD device as a proxy for coverage or service within that geographic area.[14] Subsequent assessments of CBRS deployments should reflect a more granular approach such as has been adopted in the broadband availability context.

The approach taken in the CBRS Data Report also differs substantially from how the FCC assesses spectrum use: license performance requirements. FCC licensees are generally required to meet some level of performance, often at the mid-point and end of the initial license term, so the agency can maintain licensee accountability and ensure efficient use of spectrum resources.[15] Performance can be measured in a variety of ways, including service to a minimum percentage of the population in the licensed area, service to a minimum portion of the geographic area, substantial service in the licensed area, or construction and operation of the facilities proposed.[16] CBRS PAL licensees, for instance, can satisfy their "substantial service" performance by meeting safe harbors such as signal coverage and service offerings over at least 50 percent of the population in the license area for mobile or point-to-multipoint service, or a minimum number of constructed and operational service links by population for fixed point-to-point service.[17] While the FCC's methods of assessing performance vary depending on the licensed service,[18] they each have one thing in common: they are measures of actual spectrum utilization. The CBRS Data Report, on the other hand, differs from this well-established approach to spectrum management,

[13] DODC Second Order ¶ 2.

[14] *See* NTIA CBRS Data Report Blog; CBRS Data Report at 48.

[15] *See, e.g.*, *Use of Spectrum Bands Above 24 GHz For Mobile Radio Services, et al.*, Third Report and Order, Memorandum Opinion and Order, and Third Further Notice of Proposed Rulemaking, 33 FCC Rcd 5576 ¶ 10 (2018).

[16] *Amendment of Parts 1, 22, 24, 27, 74, 80, 90, 95, and 101 To Establish Uniform License Renewal, Discontinuance of Operation, and Geographic Partitioning and Spectrum Disaggregation Rules and Policies for Certain Wireless Radio Services*, Second Report and Order and Further Notice of Proposed Rulemaking, 32 FCC Rcd 8874 ¶ 12 (2017).

[17] *See* 47 C.F.R. § 96.25(b)(4) (describing safe harbors for PAL performance requirements).

[18] *See generally* Construction Requirements by Service, FCC, https://www.fcc.gov/wireless/support/universal-licensing-system-uls-resources/construction-requirements-service (last visited May 24, 2023).

and instead suggests that one CBSD with a single 10-megahertz channel grant is sufficient to surmise service to a county.

B. The CBRS DATA Report Does Not Demonstrate that the CBRS Framework is Efficient or Effective at Promoting Innovation and Broadband Deployment.

NTIA states that the goals of the CBRS framework are to "facilitate growth in wireless broadband devices, provide cost-effective wireless broadband access for rural communities, enhance economic competitiveness by creating new jobs and new businesses, increase productivity, spur innovation, and improve public safety."[19] It goes on to state that the CBRS Data Report demonstrates the CBRS framework is "working," in particular to support connectivity and promote spectrum efficiency.[20] The data and other findings, however, do not support these claims, let alone that the CBRS model should be replicated in other bands. Without more granular data being made available to stakeholders and researchers, the benefits of the CBRS framework to rural America or innovation cannot be accurately assessed.

1. The CBRS Data Report Overstates Coverage by Assessing Service Based on Potentially a Single Grant in a County.

The CBRS Data Report is silent regarding key measures of spectrum usage like frequency, geographic, or temporal use, and provides no information regarding actual CBRS coverage to any defined subset of the population and no data on actual band utilization beyond mere channel grants. For instance, the CBRS Data Report does not provide insights as to whether a CBSD provides signal coverage and offers service, either to customers or for internal use, and what percentage of the population is covered by the CBSD, as is one option for a PAL licensee to meet FCC performance requirements.[21] Instead, the CBRS Data Report suggests broad coverage premised on potentially a single CBSD, with a single channel grant, being active in a given geographic area.[22] For example, the report identifies "128,351 CBSDs in [Dynamic Protection Area ("DPA")]-impacted counties with a total population of 232,348,897 residents"[23] intimating broad coverage, but the number of CBSDs, low-power by definition, does not substantiate coverage.

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[19] CBRS Data Report at xi.

[20] *See* NTIA CBRS Data Report Blog ("[T]here were a lot of questions about whether [the CBRS framework] would work. A new report from ITS shows that it is working.").

[21] *See* 47 C.F.R. § 96.25(b)(4) (detailing substantial performance obligations for PAL licensees).

[22] CBRS Data Report at 48.

[23] *See, e.g.*, *id*. at 50; *see also id*. at Section 5.

Actual spectrum occupancy measurements conducted in Atlanta, Kansas City, and Phoenix two years after the launch of General Authorized Access ("GAA") deployments showed only partial buildout and coverage, limited CBRS transmissions, and an "ample supply of spectrum."[24]

By contrast, actual CBRS frequency utilization is not quantified in the CBRS Data Report. The report relies on information regarding CBRS "grants," which are defined as "the mechanism by which a SAS authorizes a CBSD to use spectrum within CBRS."[25] The CBRS Data Report then assesses band utilization based on the number of "actively granted" 10-megahertz channels in each county, with the channel considered actively granted "even if its entire bandwidth is not used."[26] Thus, the CBRS Data Report conflates "active grants" with channel "use." This approach not only obfuscates actual usage of the CBRS band, but the methodology may incentivize entities in a shared spectrum band to seek multiple grants, even if the full channel is not being used, in order to disincentive potential competitors from accessing the frequencies. This is especially relevant in the GAA context. In other words, this method for determining utilization may reflect a form of spectrum squatting rather than spectrum utilization.

Moreover, even assuming full bandwidth within each granted channel is used, the report reflects less than full utilization of the band. The CBRS Data Report shows that mean utilization (again, defined as subject to an active grant) across all counties in January 2023 was 9.2 10-megahertz channels—or 92 megahertz of a 150-megahertz band.[27] That would equate to 62 percent mean usage of the CBRS band if each full 10-megahertz channel were assumed to be used. This does not warrant a finding that the CBRS framework is making more efficient use of finite spectrum resources.[28]

More granular information and more meaningful measures of spectrum use are needed to allow for an informed assessment of CBRS coverage and the relative success of the framework.

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[24] Recon Analytics CBRS Report at 3 (citing CBRS Spectrum Occupancy Measurements). In a measurement of the number of CBRS channels in use throughout three large cities (Atlanta, Kansas City and Phoenix), the most intensive CBRS use employed less than five percent of the spectrum city-wide.

[25] CBRS Data Report at 4.

[26] *Id*. at 48.

[27] *Id*. at 49, fig. 73.

[28] *See* NTIA CBRS Data Report Blog ("The success and growth of the CBRS band shows the promise of dynamic spectrum sharing to make more efficient use of this finite resource.").

2. The CBRS Data Report Overstates the Impact of the CBRS Framework in Rural Areas.

NTIA states that the CBRS Data Report shows the CBRS framework is "expanding rural wireless connectivity" and "playing an important role in connecting rural America,"[29] but the data do not validate these claims. First, while the report shows that more than 70 percent of active CBSDs were deployed in rural areas, the data do not reflect population or geographic coverage, as evidenced above.[30]

More significantly, WISP stations—which are primarily located in rural areas—have operated in part of the CBRS spectrum (3650-3700 MHz) since well before adoption of the CBRS framework, and many have converted their preexisting, pre-CBRS Part 90 Subpart Z-compliant equipment to CBSD status—a process the FCC enabled and supported.[31] The significant WISP presence in the band, and the thousands of devices that converted to CBSD status, represent holdover operations in the band and are not a product of the CBRS framework.

The FCC's Universal Licensing System ("ULS") reflects 2,849 canceled or expired 3650-3700 MHz (NN) licenses, and this was the pool of licenses that could convert to CBRS or otherwise were required to cease operating in the band.[32] In total, these licenses contained 83,102 registered base stations, corresponding to WISP base stations. The FCC recognized that the number of 3650-3700 MHz stations registered in ULS generally "does not include subscriber units, customer premise equipment, or remote terminals that communicate with base stations or access points."[33] Once WISP operations were converted to CBRS, however, such equipment was required to connect to a SAS and thus needed to convert to CBSD status. It is thus reasonable to assume that most of the 80,000-plus base stations, and their previously uncounted customer premises equipment, are now CBSDs and were accounted for in the CBRS Data Report. NTIA's data thus suggest that a substantial majority of the 150,179 CBSDs utilizing a technology categorized in the CBRS Data Report as "other" (i.e., non-LTE or 5G equipment)—which in turn accounts for roughly half of all CBSDs deployed—could credibly be legacy WISP equipment that

[29] *See id*.

[30] CBRS Data Report at 53.

[31] *See Wireless Telecommunications Bureau Reminds Part 90, Subpart Z Licensees of January 8, 2023 Final Transition Deadline in the 3650-3700 MHz Band*, Public Notice, DA 22-1355 (rel. Dec. 21, 2022).

[32] *Id*.

[33] *See* 2015 CBRS Order at n.859.

has been converted to CBRS.[34] Of course, the WISP community can provide more granular data with respect to legacy, converted deployments.

More broadly, the number of active CBSDs is not an indicator of the success of the CBRS framework, as some CBRS proponents assert. Rather, it is a sign that CBRS-style sharing is inefficient, particularly in rural areas. Given the lower CBRS power levels that limit capacity and geographic range, it can take seven times the number of CBSDs to cover the same rural service area as a standard-power deployment in comparable spectrum—a highly inefficient deployment scheme.[35]

The data in the CBRS Data Report in fact reflects inefficient spectrum use under the CBRS framework. According to the report, substantial portions of rural Mid-West and Western counties have more than 100 CBSDs deployed per 10,000 people.[36] At the state level, 10 of the most rural states have 20 or more CBSDs deployed per 10,000 people, with two having 40 or more CBSDs per 10,000.[37] In contrast, with 418,887 wireless industry cell sites deployed as of the end of 2021, there are an average of 12.6 commercial wireless sites deployed per 10,000 people nationwide.[38] This demonstrates the ever-increasing efficiency with which the commercial wireless industry utilizes each megahertz available and the ability to reach more customers with a traditional, standard-power licensing framework.[39] With these sites, the commercial wireless industry has made 4G

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[34] *See* CBRS Data Report at 3; *see also id*. at 6, tbl. 1.

[35] *See* Recon Analytics CBRS Report at 7; *see also 5G Mid-Band Spectrum Deployment*, RYSAVY RESEARCH, at 3 (Feb. 11, 2021), https://rysavyresearch.files.wordpress.com/2021/02/2021-02-5g-mid-band-spectrum-deployment.pdf ("Rysavy Mid-Band Report")

[36] CBRS Data Report at 37, fig. 49.

[37] *Id*. at 24, fig. 26.

[38] *See* CTIA, *2022 Annual Survey Highlights*, at 5 (Sept. 13, 2022), https://www.ctia.org/news/2022-annual-survey-highlights ("CTIA 2022 Annual Survey Highlights").

[39] To be sure, a full analysis of the overall efficiency of CBRS deployments versus standard-power deployments would also take into account the costs of deploying and maintaining infrastructure, which is beyond the scope of the CBRS Data Report. *See, e.g.*, Rysavy Mid-Band Report at 13. Yet it stands to reason that if more sites at lower power were more economically efficient, market forces would have already driven wireless providers in that direction—just as market forces have driven a sharp decline in wireless rates, increased spectrum efficiency, and rapid deployment of licensed networks. *See, e.g.*, *Spectrum Allocation in the United States*, ACCENTURE, at 3 (Sept. 28, 2022), https://api.ctia.org/wp-content/uploads/2022/09/Spectrum-Allocation-in-the-United-States-2022.09.pdf; *Unpacking the Costs of Mobile Broadband Across Countries*, OXFORD ECONOMICS (Nov. 30, 2022), https://api.ctia.org/wp-

service available to 99.7 percent of the U.S. population, including 98.6 percent of Americans living in rural areas, and 5G to 97.7 percent of the U.S. population.[40] As noted above, the CBRS Data Report does not provide any reliable calculation of the corresponding figures for CBRS deployments—but surely CBRS does not meet that coverage level.

At this point, the multitude of CBSDs is not a marker of success. Rather, it simply reflects the fact that, as a matter of physics, the CBRS framework's power restrictions requires substantially more infrastructure to serve the same area.

3. The CBRS Data Report Overstates the Success of the CBRS Framework on Promoting Innovation.

Although one goal of the CBRS framework is to promote innovative use cases, it appears that wireless innovation is occurring despite, not because of, the CBRS framework.

In the CBRS auction, 16 of the top 20 PAL auction winners were traditional communications providers,[41] and their CBRS deployments are generally used to supplement wireless broadband capacity in localized areas.[42] While important to meeting growing demand, their use of CBRS spectrum is nonetheless preemptible and lower power, boosting capacity where deployed.

One example involves cable companies that were among the big PAL winners, but it is unclear how much innovation or usage is occurring. While the cable industry touts CBRS as part of its wireless service offerings, it is important to recognize that cable companies are Mobile Virtual Network Operators ("MVNOs") and where they do deploy, they target CBRS deployments in high-traffic areas to offload customer traffic from their MVNO arrangements. The wireless service offerings that cable companies sell rely primarily on the wide-area networks of the underlying mobile network operator, which in turn rely on full-power, commercial spectrum for deployments at scale.[43] The efficiencies of those wide-area networks may be one reason why some cable

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content/uploads/2022/11/CTIA-Oxford-Economics-Report-Cost-of-Mobile-Broadband.pdf; CTIA 2022 Annual Survey Highlights at 8.

[40] *Communications Marketplace Report*, 2022 Communications Marketplace Report, FCC 22-103, at 110, fig. II.B.37; 113, fig. II.B.41; and 111, fig. II.B.39 (rel. Dec. 30, 2022).

[41] *See supra*, note 4; *see also* Nick Ludlum, *CBRS Spectrum Goes Unused. Just Ask Cable*, CTIA BLOG (May 23, 2023), https://www.ctia.org/news/cbrs-spectrum-goes-unused-just-ask-cable.

[42] *See* CTIA National Spectrum Strategy Comments at 28-29.

[43] *Id*. at 29.

providers are "in no rush" to deploy CBRS[44]: the CBRS network is not scalable to create a coverage layer that can support wide-area deployment. Further, as noted above, WISPs are some of the more prominent users of CBRS spectrum, and many simply converted their Part 90 operations to CBRS-compliant equipment. And the more isolated use cases that some proponents reference to support a claim of CBRS innovation are often indistinguishable from the types of private networking and Wi-Fi offerings available for years at corporate campuses, schools, factories, and other facilities. Consideration of these factors would improve NTIA's analysis.

Significantly, the CBRS Data Report states that Category B (outdoor-only) devices represent at least 96 percent of all active CBSDs in each quarter evaluated,[45] and just 3.5 percent of all active CBSDs are indoor Category A devices, suggesting that the extremely low power levels associated with indoor Category A devices are not desirable in the marketplace. Whereas outdoor deployments represent lower power, localized wide-area networks, the indoor Category A devices were thought to hold the potential to deliver some of the innovative use cases available for private wireless networks.[46] The data suggest that those uses have yet to take off.

C. Any Additional Studies of the CBRS Framework Should be Informed by Credible Data Collection.

As suggested above, CTIA has a number of suggestions for other methodologies NTIA could apply to identify data that will better asses CBRS usage and coverage.

NTIA could improve the next phase of CBRS assessment by obtaining more granular information from the SAS Administrators and mapping CBSD coverage. The SASs have geolocation and EIRP data for each CBSD which, along with propagation models that account for local terrain, could identify aggregate coverage information with far better insight in keeping with the broadband availability mapping. To that end, Federated Wireless has reported that it is able

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[44] *See supra*, note 4 ("Like Comcast, which also is in no rush to deploy CBRS, Charter intends to apply the spectrum in high usage areas that can generate the highest return on investment.").

[45] CBRS Data Report at 12, tbl. 3.

[46] *See, e.g.*, 2015 CBRS Order ¶ 206 (stating the FCC's expectation that Category A CBSDs "will be widely prevalent in the 3.5 GHz Band"); *see also* Comments of NCTA - The Internet and Television Association, GN Docket No. 17-258, at 1-2 (filed Dec. 28, 2017) (discussing CBRS proponents' plans to utilize CBSDs to support indoor applications such as "private LTE networks in managed buildings" and "IoT or machine-to-machine deployments in factories and businesses").

to produce a "Spectrum Coverage Heatmap" that provides useful information about actual CBRS usage.[47] Such data would be more significant than a mere accounting of the number of CBSDs in a given area. While including such graphic displays for the entirety of nationwide CBRS deployment might not be practical for a single report, NTIA could greatly increase the usefulness of its CBRS reporting and provide a better understanding of the actual nature and extent of CBRS usage.

Another approach would be to leverage the methods used in NTIA's November 2016 "Quantitative Assessments of Spectrum Usage" Report ("Quantitative Assessment"), where NTIA directed federal agencies to report on actual spectrum usage in frequency bands that NTIA had targeted for potential commercial use.[48] With the Quantitative Assessment , NTIA applied parameters that would help "verify system characteristics . . . to enable calculation of the geographic coverage area used by these systems" and to "provide estimates of time of use."[49] By assessing three independent factors—frequency (bandwidth) use, geographic use, and time of use—NTIA was able to approximate the use of each federal system within its assigned spectrum range via a Total Spectrum Usage output. The purpose of the CBRS Data Report—to "quantify" commercial use of the 3550–3700 MHz band in the U.S.—aligns closely with the data objective of the Quantitative Assessment. Further NTIA analysis of CBRS would therefore benefit from assessment of similar factors as were evaluated in the Quantitative Assessment.

NTIA's description of the planned next phase of CBRS evaluation is generally more consistent with the framework utilized by the agency in the Quantitative Assessment: a companion study that "will deploy sensors to measure how much spectrum CBRS emissions are actually occupying over time near DPAs."[50] NTIA could ensure that geographic-, usage-, and time-

[47] *See Federated Wireless Spectrum Controller Datasheet*, FEDERATED WIRELESS, at 6, https://www.federatedwireless.com/wp-content/uploads/2017/09/Federated-Wireless-Spectrum-Controller-Datasheet-Sept-2017-Final1.pdf (last visited May 30, 2023).

[48] *Quantitative Assessments of Spectrum Usage*, National Telecommunications and Information Administration, U.S. Department of Commerce (Nov. 2016), https://ntia.gov/report/2016/quantitative-assessments-spectrum-usage. The Quantitative Assessment was conducted in response to Presidential Memoranda on spectrum repurposing for commercial wireless broadband services and shared spectrum access between federal and commercial users.

[49] *Id*. at vi.

[50] *See* NTIA CBRS Data Report Blog ("A companion study now in its initial phase will deploy sensors to measure how much spectrum CBRS emissions are actually occupying over time near DPAs. Complementary studies such as these, designed in collaboration with stakeholders to analyze spectrum utilization from multiple angles, provide objective data to inform future sharing proposals.").

based assessments are made for CBRS nationwide in addition to deployments near DPAs. This quantification should exclude or separately assess the impact of grandfathered sites that were merely updated to satisfy the CBRS requirements.

Ultimately, to enable an accurate assessment of the relative strengths and weaknesses of the CBRS framework against other licensing models, NTIA should assess the CBRS coverage outputs against a baseline of standard-power operations such as C-Band deployments, which have been rapidly and extensively deployed nationwide. The CBRS experiment has to be compared to some other framework in order to assess its success, and should not be viewed in isolation.

Revising its assessment consistent with these recommendations would be more in keeping with the Administration's directive regarding evidence-based policymaking by providing a more accurate and granular accounting of the potential impacts of the CBRS framework.[51]

D. Standard-Power, Nationwide Deployments are Critical to Achieving the Administration's Broadband Goals.

While the CBRS framework has yet to achieve the goals of fostering innovation or supporting broadband deployment at scale, standard-power licensed operations have proven successful in achieving these and other Administration priorities. Exclusively licensed spectrum, made available to licensees at auction, is the bedrock of wireless innovation, supporting billions of dollars in investment annually and generating trillions of dollars for the U.S. economy.[52] An auction-based model for licensing and spectrum assignment for standard-power operations under assured access creates the right incentives to maximize spectrum use, as the successful U.S. commercial wireless industry shows.[53] There is also a long tradition of collaboration between federal agencies and the wireless industry to make spectrum available for shared commercial use through reliance on geographic- and/or temporal-based sharing when cleared

[51] *See* Memorandum on Restoring Trust in Government Through Scientific Integrity and Evidence-Based Policymaking, The White House, at Sec. 5 (Jan. 27, 2021), https://www.whitehouse.gov/briefing-room/presidential-actions/2021/01/27/memorandum-on-restoring-trust-in-government-through-scientific-integrity-and-evidence-based-policymaking/.

[52] *See, e.g.*, Aren Megerdichian, *The Importance of Licensed Spectrum and Wireless Telecommunications to the American Economy*, COMPASS LEXECON, at 3 (Dec. 7, 2022), https://www.ctia.org/news/the-importance-of-licensed-spectrum-and-wireless-telecommunications-to-the-american-economy; CTIA 2022 Annual Survey Highlights at 3.

[53] *See, e.g.*, CTIA National Spectrum Strategy Comments at 19-21.

spectrum is not achievable, including in the Advanced Wireless Service and 3.45 GHz bands.[54] The Administration should be considering ways to advance this proven method of sharing.

Prioritizing cleared spectrum and leveraging static sharing when clearing is not possible has enabled full-power deployments that can support wide-area networks across the country; provide sufficient certainty to inform auction participation and allow the license holder to invest and build next-generation, secure networks; and offer certainty as to access and the quality of service that consumers, enterprises, and government users have come to expect, which are otherwise unpredictable and unreliable in a dynamically shared environment.[55]

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Mid-band spectrum, with its coverage and capacity characteristics, has served as the backbone for global 5G deployments. Given the importance of mid-band spectrum to U.S. economic and national security interests, any review of the CBRS framework or other dynamic sharing models should apply sound methodology that assesses more than just the potential service of a single site in a geographic area. Anything less would risk artificially inflating the impact of such experimental approaches on spectrum management, contradicting the Administration's goal of promoting evidence-based policymaking and NTIA's goal of promoting efficient spectrum use. We appreciate NTIA's efforts to produce a meaningful assessment of the utility of the CBRS framework, and look forward to supporting NTIA as it works to incorporate improvements such as those identified above to more accurately evaluate the experiment's success. It would be premature to extend the CBRS experiment to any other bands until a more fulsome and accurate review of the framework can be conducted.

Sincerely,

/s/ Thomas C. Power

Thomas C. Power
Sr. Vice President and General Counsel

[54] *See id*. at 21-27.

[55] *See id*. at 11-19; *see also, e.g.,* Patrick Donegan, *Aligning Spectrum Policy with Cybersecurity Goals*, HARDENSTANCE (May 2023), https://api.ctia.org/wp-content/uploads/2023/05/Aligning-spectrum-policy-with-cybersecurity-goals-FINAL.pdf.