

Dynamic Spectrum Alliance Limited

21 St Thomas Street
Bristol BS1 6JS
United Kingdom

<http://www.dynamicspectrumalliance.org>

3855 SW 153rd Drive
Beaverton, OR 97003
United States



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

In the Matter of

Promoting Investment in the 3550-3700 MHz Band; GN Docket No. 17-258

Petitions for Rulemaking Regarding the Citizens
Broadband Radio Service

COMMENTS OF THE DYNAMIC SPECTRUM ALLIANCE

Kalpak Gude
President, Dynamic Spectrum Alliance
3855 SW 153rd Drive
Beaverton, OR 97003, USA

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A. Introduction and Summary

The Dynamic Spectrum Alliance (DSA), whose membership spans multinationals, small-and medium-sized enterprises, and academic, research, and other organizations from around the world, is committed to creating innovative solutions that will expand broadband solutions for consumers and businesses alike.¹ To this end, we respectfully submit the following comments to the Commission’s Notice of Proposed Rulemaking (NPRM) noted above.²

The DSA believes that significant effort and investment has been expended by industry and government over the last number of years since the FCC’s *First Report and Order* in the CBRS proceeding was issued. We are now at the cusp of seeing the results that investment and do not believe that this is the right time for the Commission to make significant changes to the CBRS rules upon which that investment was made. As much as the CBRS NPRM seeks to characterize the proposed changes as being minor, we believe they will have significant negative impact on the opportunities of the majority of new players that are planning to deploy infrastructure.

¹ The DSA’s membership spans multinationals, small-and medium-sized enterprises, and academic, research, and other organizations from around the world, all working to create innovative solutions that will increase the amount of available spectrum to the benefit of consumers and businesses alike. A full list of DSA members is available on the DSA’s website at www.dynamicspectrumalliance.org/members/.

² In the Matter of Promoting Investment in the 3550-3700 MHz Band, Notice of Proposed Rulemaking and Order Terminating Petitions, FCC-CIRC1710-04 (“CBRS NPRM”).

In the NPRM, the Commission asks questions on the following topics: Regarding Priority Access License (PAL) rules, (1) Whether PAL license terms should be increased from three years to ten years and whether the licenses should have an expectation of renewal; (2) Whether the geographic license area for a PAL should be increased, and if so whether a partial economic area (PEA) is the correct size; (3) Whether partitioning and disaggregation of PALs is appropriate in light of the other PAL changes contemplated in the NPRM; (4) Whether the current rule regarding SAS public disclosure of CBSD registration information is appropriate; and (5) Whether changes to the competitive bidding procedures for PALs are necessary. DSA is open to changes to improve the rules and the opportunities for new entrants and new infrastructure investment. We do not believe, however, that the modifications contemplated in the CBRS NPRM generally further those goals and thus we urge the Commission to err on the side of caution as it evaluates the comments from this proceeding and plans the steps forward for this groundbreaking spectrum band.

License Term and Renewability: As is explained below, the DSA urges the FCC to retain the current three-year term for PALs as the record demonstrates that the rules are not deterring investment, but rather bringing in new ideas for network deployment that previous spectrum access models never enabled. Longer PAL terms, particularly ten-year terms, will front load and increase spectrum access costs to create a barrier to entry for many of the new and innovative investment opportunities that the CBRS band has created. DSA has always supported tying the PAL term to the time necessary for a return on investment, and given the well understood small cell nature of the band, we believe the FCC was correct in establishing a three-year PAL term. Further, we believe that discussion of a buildout requirement associated with a ten-year PAL term highlights the inefficiency of this proposal as it would add regulatory costs and burdens that the current 3-year term avoided. Finally, the DSA also opposes the idea of a renewal expectancy for PALs. Such a concept runs counter to the goals of establishing an “innovation band” that incentivizes and encourages the latest and most efficient technology. It would instead reward parties that sought to maximize the return on investment of outdated technology.

Geographic License Areas: DSA continues to believe that the census tract is the correct size for PALs in the CBRS band. No new information was added in the proceeding justifying any fundamental shift from the Commission's earlier determination. PEA sized PALs would be too large and too expensive for anyone except the large national wireless carriers. Diminishing the opportunity for a greater diversity of entities to purchase PALs is unlikely to increase the variety of technologies that are deployed. Further, a PEA-sized PAL would be inconsistent with Section 309(j) of the Act, and run counter to the mandates of that section. Finally, large PALs would be harmful to the goal of encouraging greater rural deployment by raising the costs of spectrum access for rural providers.

Secondary Markets: The DSA believes that the current framework of enabling PAL holders to aggregate census tracts as needed to expand deployments is a more efficient methodology to encourage investment and deployment than partitioning and disaggregation. Partitioning and disaggregation would not mitigate the preclusive impact of PAL sizes larger than census tracts. Even if the Commission authorizes the full range of secondary market transactions, there is no obligation and little incentive for the largest service providers to partition or lease unused portions of large license areas, as has been shown historically. Large wireless operators will not have incentive to partition or lease portions of their larger PALs without significant buildout requirements, and although such mechanisms may be useful, they would be far less efficient than maintaining smaller PALs. Finally, establishing PEA-sized PALs and permitting partitioning or disaggregation would merely increase the costs for smaller entities, which would be particularly harmful for those least capable of affording it.

Spectrum Access System (SAS) Public Disclosure of CBRS Device (CBSD)

Registration Information: DSA believes that the current rules requiring disclosure by SAS administrators of anonymized CBSD information adequately protect confidentiality and sensitive competitive network information. Disclosure of the basic CBSD registration information used by SAS operators to calculate protection areas between PALs and access to vacant PAL spectrum on a General Authorized Access (GAA) basis is necessary to the functioning of the CBRS framework.

Competitive Bidding Procedures for PALs: DSA believes that allowing PAL licensees to bid on specific channel assignments is neither feasible, desirable, or necessary. Dynamic spectrum assignment of frequencies is required to protect incumbent Federal users and is the cornerstone of the CBRS three-tier access framework. Existing rules require a SAS to assign geographically continuous PALs held by the same licensee to the same channels in each geographical area, to the extent feasible. This requirement adequately meets any necessary network management needs. Finally, DSA is concerned that adoption of static channel assignments would give Federal incumbents a reason to take additional time to digest what such changes may mean operationally and politically, further delaying the accessing of all CBRS frequencies across the entire United States.

B. PAL Licensing Rules

1. License Term and Renewability

Background: The FCC's *First Report and Order* established a three-year license term for PALs, with no expectation for renewal.³ In establishing three-year terms, the Commission balanced the interests of parties that sought shorter one-year term PALs to stimulate innovation through added flexibility with those that sought longer terms that they believed would spur investment through added certainty.⁴ The Commission also

³ Report and Order and Second Further Notice of Proposed Rulemaking, 30 FCC Rcd 3959 (2015) (*First Report and Order*) ¶ 105. Further, “where a prospective user of the band does require a PAL as a predicate to investment,” the first application window does provide the applicant the ability to apply for up to two consecutive three-year terms for a given PAL. *Id.* ¶ 111.

⁴ *Id.* ¶ 106-107.

rejected claims that non-renewability would diminish investment, concluding instead that time-limited, non-renewable PALs would “promote investment by traditional and non-traditional providers of wireless broadband service.”⁵

In reaching this conclusion, the Commission specifically dismissed the claims of some commenters that shorter PAL terms would diminish investment and strand capital.⁶ The Commission stated that deployment in the 3.5 GHz band will involve lower costs due to the small-cell use case, and that the economics and upgrade cycle will be significantly faster than for traditional macro-cells in other bands.⁷ Further, the Commission noted that the initial PAL auctions allowed for two successive three year terms and allowed for participation in subsequent auctions.⁸ Also, that the non-fixed frequency assignment model and band-wide equipment operability rule would increase the substitutability of PALs in a given area, and substantially reduce risk of stranded investment.⁹

The Commission also concluded that “prescribing three year, non-renewable license terms for PALs, coupled with the absence of a renewal expectancy, will operate in combination with our rules permitting opportunistic GAA use and the relatively inexpensive deployment costs in this band to ensure that winning bidders for PAL

⁵ *Id.* ¶ 108.

⁶ *Id.* ¶ 109-111.

⁷ *Id.* ¶ 108-110.

⁸ *Id.* ¶ 110.

⁹ *Id.* ¶ 111.

licenses at auction will have sufficient incentive to deliver service so as to avoid the need for prescribing any further performance requirements.”¹⁰

NPRM: In the NPRM, the Commission stated that it is considering fundamental changes to PAL licenses by increasing the term from three to ten years, and allowing renewability of PAL licenses. The Commission sought comment on this change and on the appropriate performance requirements and renewal standards for PALs.¹¹

DSA Position: The record demonstrates that the Commission’s 2015 assessment was correct: the current three-year PAL terms are not deterring investment. Indeed, diverse and innovative companies such as Ericsson, Intel, Nokia, Qualcomm, Ruckus Wireless, and others have invested in new applications,¹² such as industrial IOT, rural access services,¹³ indoor deployment technologies,¹⁴ and more. By contrast, commenters in support of CTIA’s and T-Mobile’s Petitions have not provided any evidence on the record to justify changes to the current three-year PAL term with no renewal expectancy. Rather, they have simply restated their previously rejected positions.

¹⁰ *Id.* ¶ 113.

¹¹ NPRM at ¶ 13.

¹² See DSA Comments filed July 24, 2017 in response to Petition for Rulemaking to Amend the Commission’s Rules Regarding the Citizens Broadband Radio Service in the 3550-3700 MHz Band, Petition for Rulemaking, GN Docket No. 12-354 (filed July 16, 2017)(“CTIA Petition”).

<https://ecfsapi.fcc.gov/file/1072450166116/DSA%20CBRS%20Comments%20July%2024%202017.pdf>

¹³ See OTI Comments to CTIA Petition at p. 12-19.

https://ecfsapi.fcc.gov/file/10725500028769/OTI_PK_CBRS%203.5%20Petitions_Comments_FINAL_AsFiled_072417.pdf.

¹⁴ RUCKUS WIRELESS, Ruckus Wireless Shares Vision for the Future on InBuilding Cellular (Feb. 18, 2016), <https://goo.gl/2KgMqF>.

The characteristics of 3.5 GHz spectrum, and the rules required to coexist with military and other incumbents without harmful interference, make this spectrum well suited for small cell deployments with intensive spectrum reuse. Ten-year PALs will front load and increase spectrum access costs into a single up-front barrier to entry, making PALs uneconomical for many, if not most, of the new and innovative investments by private industry that have been brought into the band by the flexible framework created by the existing rules. In fact, as GE¹⁵ and WISPA¹⁶ and others point out, it is new investment by non-traditional wireless users that is at risk of being sidelined or stranded by changes to the current PAL framework, with large national carriers being the sole beneficiary of such changes.

DSA has always been consistent that license terms should be tied to the length of time required to ensure return on initial capital investment. Given the characteristics of relatively inexpensive small cell deployments, shorter PAL terms are the most appropriate for the CBRS band. If the Commission is serious about innovation, nothing can justify ten-year terms with an expectation of renewability, amounting to de facto perpetual licenses.

The Commission also asks whether, if the term is extended, an associated construction requirement is necessary. The DSA believes that in asking this question, the Commission is highlighting the economic inefficiency of the proposal to extend PAL

¹⁵ General Electric Company Reply Comments at 8-16,
<https://ecfsapi.fcc.gov/file/10809259041990/GE%20Reply%20Comments%20-%208.2017%20-%20FINAL.pdf>.

¹⁶ Wireless Internet Service Providers Association (WISPA) Comments at p. 20-25,
<https://ecfsapi.fcc.gov/file/10724505007250/CBRS%20Comments.pdf>.

terms to ten-years with a presumption of renewal. Such provisions would require an associated build-out requirement, which would add regulatory costs and oversight/enforcement burden. Rather, the market-based approach of having shorter terms, more auctions, and wider access to the band is far more preferable than the type of regulatory oversight of build-out that would be required in moving to 10-year PALs. But if the Commission does increase the term, as proposed, we believe that build-out must be required to prevent valuable spectrum from being warehoused or wasted on a long-term basis.

Further, we believe that adding a renewal expectancy will also add the need for the Commission to evaluate whether the technology that is deployed is up-to-date, and consistent with the purposes of the “Innovation Band” as envisioned by this Commission only a few short years ago. To do otherwise will merely be granting a blank check to the PAL auction winners, without any necessary incentives to drive for highest valued use. Though the NPRM notes the importance of CBRS in the deployment of “5G technology,”¹⁷ the fact of the matter is that the definition of 5G technology is still being determined. One thing that is clear is that 5G will not be a mere continuation of traditional wireless networks, and will instead be a technologically heterogeneous network of networks, including IOT, private LTE, small cells, and other yet-to-be-discovered applications.¹⁸ Creating de facto perpetual licenses stifle those

¹⁷ NPRM at ¶ 2.

¹⁸ See Recommendation ITU-R M.2083-0 (09/2015) IMT Vision – Framework and overall objectives of the future development of IMT for 2020 and beyond, M Series, Mobile, radio determination, amateur and related satellite services (https://www.itu.int/dms_pubrec/itu-r/rec/m/R-REC-M.2083-0-201509-!!!PDF-E.pdf).

advancements. Having frequent auctions, on the other hand, lowers barriers to entry, promotes deployment of new technology and innovation, and ensures that the users who value the spectrum the most are able to obtain PALs and use them.

2. Geographic License Areas

Background: In the *First Report and Order*, the Commission adopted census tracts as the appropriate license size for PALs, concluding that census tracts were the appropriate geographic size to allow “flexible and targeted network deployments, promot[e] intensive and efficient use of the spectrum, [and] also allow[] easy aggregation to accommodate a larger network footprint.”¹⁹ Given that census tracts vary in size depending on population density, nest into counties, other political subdivisions, and into other Commission used licensing areas (e.g., CMAs, EAs, and Partial Economic Areas), the Commission believed them to mirror key considerations in targeted deployment by service providers. Census tracts were also viewed as aligning well with small cell deployments, which have low power and small size.²⁰

The Commission addressed the requests of some commenters for larger PALs, consistent with other licensed mobile bands. The Commission stated that “the mandate of Section 309(j) strongly supports our goal ... of providing economic opportunity to a wide variety of applicants” and that the census tract sized PAL would provide “opportunities for participation with much lower capital investment requirements.”²¹

¹⁹ *First Report & Order*, ¶ 108.

²⁰ *Id.* ¶ 97-98.

²¹ *Id.* ¶ 100.

NPRM: In the NPRM, the Commission states that it proposes to increase the geographic licensing area of PALs to stimulate investment, promote innovation, and encourage efficient use of spectrum.²² The Commission seeks comment on whether larger PALs would facilitate deployment of a variety of technologies, including 5G, whether PEAs are the right size for PALs, whether PEAs balance the objectives in section 309(j) of the Act, and what impact PEAs would have on rural deployment and existing investment.

DSA Position: As stated in DSA's comments to the petitions, DSA continues to believe that the Commission found the correct balance when it concluded that census tracts were the appropriate geographic size for PALs. Neither petitioners nor commenters in support of the petitions have added new information that was not already in the record that the Commission considered at the time of the *First Report and Order*. Indeed, the record is exceedingly clear: large PEA-sized PALs would only be useful and valuable for national wireless carriers. A large number of non-carrier entities filed stating exactly this. Even for large wireless carriers, the value of PEA-sized PALs is questionable given that the CBRS band, due to the incumbency issues and technical rules, is designed for small cell deployments. Large PAL sizes like those suggested would run counter to the deployment plans that the band will require.

PEA-sized PALs, which can span hundreds of square miles and cover millions of people, would be too expensive and highly inefficient to acquire for entities seeing to

²² *CBRS NPRM* ¶ 23.

cover campuses, hotels, warehouses, schools, or rural communities with small cell networks. PEA-sized PALs would require these new entrants in the band to acquire expansive licenses, covering areas and spectrum that may be thousands of times larger than their actual use,²³ which in turn will greatly increase the price of access to the PAL tier, and effectively shut out those without large amounts of up-front capital to take part in an auction. For example, the PEA covering the New York City area also covers a vast population and geography including Long Island and other parts of New York State, much of New Jersey and Connecticut, as well as parts of Pennsylvania.²⁴ On the other hand, New York City alone contains 2168 census tracts.²⁵ Indeed, the record demonstrates that the universe of entities for which PEA sized PALs may be beneficial is only one – large wireless carriers.

Diminishing the opportunity for a greater diversity of entities to purchase PALs is unlikely to increase the variety of technologies that are deployed in the band. Large PALs will have a greater tendency to support a more common and uniform use case, rather than smaller PALs. Given that 5G is still an evolving concept, larger PALs are inconsistent with even the notion that the band will be 5G focused.

Further, PEA-sized PALs would be inconsistent with Section 309(j) of the Act, as it would strongly bias the PAL opportunity in favor of large wireless carriers. It is hard to

²³Census tracts, as defined by the United States Census Bureau, are “small, relatively permanent statistical subdivisions of a country” and have “a population size between 1,200 and 8,000 people, with an optimum size of 4,000 people.” www.census.gov/geo/reference/gtc/gtc_ct.html. There are approximately 77,000 census tracts in the U.S. Partial Economic Areas are significantly larger than census tracts. The United States is divided into 416 PEAs. DA-14-759A1.pdf.

²⁴See https://apps.fcc.gov/edocs_public/attachmatch/DA-14-759A4.pdf.

²⁵<http://www1.nyc.gov/assets/planning/download/pdf/data-maps/maps-geography/census-factfinder/cff-faq.pdf>.

imagine how a larger PAL could “promote (i) an equitable distribution of licenses and services among geographic areas, (ii) economic opportunity for a wide variety of applications, including small businesses, rural telephone companies, and businesses owned by members of minority groups and women, and (iii) investment in and rapid deployment of new technologies and services.”²⁶ The Commission’s attempts to suggest that secondary markets and disaggregation rules may save this negative result is also incorrect, as is noted below.

The Commission recognized this outcome in the *First Report and Order*. The Order states that “traditional licensing areas will not allow users of the band to acquire PALs only for [small] geographical areas they intend to serve. Divesting large, unwanted swaths through secondary markets transactions could impose significant transactions costs. On the other hand, should users of the band desire to provide service within traditional geographical license areas, they can aggregate multiple contiguous census tracts.”²⁷ The Commission thus recognized that there was a choice between making PALs naturally suited for a large variety of entities, consistent with Section 309(j), and allowing aggregation of adjacent PALs by the large and sophisticated national carriers that are well equipped to handle the transaction costs, or make PALs large, effectively available to only large carriers and impose a tax on all entities, both large and small, to create secondary markets to disaggregate to excess inherent in large PALs. The

²⁶47 U.S.C. § 309(j)(4)(C).

²⁷ *First Report & Order*, ¶ 100.

Commission decided wisely in the *First Report and Order* and we urge the Commission to maintain the current rule.

Finally, the record is clear that rural deployment would be negatively impacted by larger PALs. Large PALs, such as those based on PEAs, would include both urban and rural areas within a single PAL. Rural service providers would be forced to bid on vast geographical areas they never intend to serve, for PAL spectrum they never intend to use, and outbid other services providers--such as the large mobile carriers--seeking to serve urban areas with greater capacity. These economic barriers to entry would almost certainly make it impossible for rural service providers to acquire such PALs. Further, acquiring rural parts of PALs through secondary auctions would merely raise the costs to those rural service providers, companies that can least afford to pay the “hidden tax” of these transaction costs. The inefficiency created would thus harm those that are most challenged to bear the operational burden and cash outlay.

3. Secondary Markets

Background: The Commission’s *Second Report and Order* concluded that unlike traditional cellular bands, with very large license areas and ten-year license terms, “the 3.5 GHz Band’s relatively short license terms and small license areas should facilitate faster deployment of service and allow providers to target smaller populations, meeting the same goals.”²⁸ The Commission instead determined that a “light touch leasing process” can serve the same goal of making unused spectrum available on a market-

²⁸ Order on Reconsideration and Second Report and Order, *Amendment of the Commission’s Rules with Regard to Commercial Operations in the 3550-3650 MHz Band*, GN Docket No. 12-354, 31 FCC Rcd 5011, at ¶ 229 (2016) (*Second Report and Order*).

driven basis since PAL holders “are free to lease any portion of their spectrum or license outside of their PAL Protection Area” and “without additional administrative burden.”²⁹ NPRM: The NPRM proposes to allow partitioning and disaggregation of PALs in secondary market transactions and asks: “If we were to adopt a larger geographic license area for some or all PALs, would allowing partitioning and disaggregation of PALs enable prospective PAL licensees ‘to acquire PAL rights in smaller geographic areas where their business needs call for it.’”³⁰

DSA Position: DSA believes that although allowing partitioning and disaggregation offers some benefits, particularly in rural areas (where even census tracts can be very large), it would be completely ineffective as a means of facilitating access to PAL spectrum by smaller service providers, or enterprise and industrial users seeking interference protection for targeted and localized deployments. A better alternative is the current framework, which enables PAL holders to aggregate census tracts as needed to expand their deployments. Secondary markets are likely to be far more efficient in meeting the needs of a PAL licensee for additional census tracts than they would be in facilitating a partitioning of PEA or other large size (e.g., county-sized) licenses that, in all likelihood, can be acquired only by national or regional service providers that have historically demonstrated they are disinclined to sell or lease spectrum to potential competitors or customers. Large service providers are also in a far better position to navigate the complexities of secondary markets to expand their PAL

²⁹ *Id.* at ¶ 228.

³⁰ *Id.* at ¶ 228, quoting AT&T Reply Comments at 6-7.

footprint or capacity as compared to smaller and more local entities. Whether or not the Commission allows partitioning and disaggregation, it should retain census tracts as the fundamental (and most efficient) building block for CBRS networks.

The NPRM asks to what extent would partitioning and disaggregation facilitate the objectives of Section 309(j), including specifically the promotion of “economic opportunity for a wide variety of applications.” DSA believes that if the option to partition or disaggregate a PAL is added to the current PAL licensing framework, it could enhance the flexibility of secondary markets. However, it is speculative at best to conclude that partitioning and disaggregation would mitigate the preclusive impact of PAL areas larger than census tracts. Large PAL licensees will have little incentive to allow for competition and have no track record of creating robust secondary markets for smaller companies. Even with a build-out requirement, if PAL terms are extended to ten years, large PAL licensees could warehouse spectrum for years (far beyond the replacement life cycle of small cell deployments or rural point-to-point wireless service providers) before regulatory pressure encourages disaggregation and partition. Plainly stated, revising the rules to create traditional licenses most suitable for the large national carriers (e.g., large areas, long terms, non-competitive renewal) undermines the Congressional objectives stated in Section 309(j). A unanimous Commission in 2015 concluded that “traditional licensing areas will not allow users of the band to acquire PALs only for [the small] geographical areas they intend to serve.”³¹ As we noted in the section above, in the context of the CBRS framework and technical rules, a

³¹ *First Report & Order* at ¶ 100.

PAL area much larger than a census tract would be inconsistent with *each and every objective* of Section 309(j) of the Act, as it would strongly bias the PAL opportunity in favor of one small group of large national carriers.

The advantage of the current rules is that they allow large service providers, or virtually any wireless operator, to add capacity or to aggregate contiguous census tracts either by acquiring more PALs or through the spectrum exchanges that are expected to emerge to take advantage of the light-touch leasing process. In contrast to license areas as large as PEAs, the current framework will make PALs would be more liquid and more likely to attract purchasers who set themselves up as local wholesalers of leased access to individual enterprises and venues. Smaller operators and localized use cases would not be hostage to an unproven secondary market for partitioning licenses that will depend entirely on whether a handful of providers that acquire PALs as large as PEAs or counties ultimately decide it is in their self-interest to facilitate spectrum access for potential competitors or substitutes for their own network services.³² National or even regional service providers have little if any incentive to support the emergence of alternative, edge-based networks, disruptive technologies, or new ISP market entrants that could turn into competitors or substitutes.

Even if the Commission authorizes the full range of secondary market transactions, there is no obligation and little incentive for the largest service providers to either

³² See Comments of Southern Linc, GN Docket No. 12-354, RM-11788, RM-11789, at 7-8 (filed July 24, 2017) (“there is no requirement for any licensee to lease, partition or disaggregate a license, and even if permitted . . . there would be even less of an incentive for a PAL holder to do so given the lack of any build-out or coverage requirements.”).

partition or lease the unused portions of large license areas. WISPA correctly noted in its comments opposing the Petitions that “historically, large carriers acquire licenses for large areas, build out in the urban core where the population is more dense, and warehouse spectrum in rural areas that could be used for broadband deployment.”³³ WISPA and other rural service providers have noted that despite inadequate fixed and mobile coverage in most rural areas, there is little evidence of an active market to partition or disaggregate unused carrier spectrum to meet that demand.³⁴ As Google observed in its comments, “the buy-and-hold behavior” of incumbent carriers in other bands suggests that once carriers acquire spectrum, that “do not relinquish it, even if goes unused or underused.”³⁵

In addition, although any operator can fall back on the 80 megahertz of GAA spectrum to bridge a PAL coverage gap, many small providers do not view unprotected GAA spectrum as a viable substitute for the interference protection that accompanies a PAL. There are potentially thousands of industrial and enterprise networks, deployed to connect critical infrastructure, for specialized IoT networks, telemetry, and for other sensitive communication, that have as much if not greater need for PAL spectrum.³⁶ And, unlike large mobile carriers, these enterprise and industrial users will not have the

³³ Comments of WISPA, GN Docket No. 12-354, RM-11788, RM-11789 (filed July 24, 2017), at 25.

³⁴ See, e.g., Comments of Rural Wireless Assn and NTCA—The Rural Broadband Association, GN Docket No. 12-354, RM-11788, RM-11789 (filed July 24, 2017), at 5;

³⁵ Comments of Google, GN Docket No. 12-354, RM-11788, RM-11789, at 26 (filed July 24, 2017) (“incumbent carriers’ buy-and-hold behavior in other bands suggests that they likewise will not engage in partitioning or disaggregation here. . . . The truth is that the carriers, once they have spectrum, do not relinquish it, even if goes unused or underused.”).

³⁶ See, e.g., Reply Comments of General Electric, GN Docket No. 12-354, RM-11788, RM-11789, at 3-7 (filed August 8, 2017) (“GE Relies on High-Throughput, Low-Latency Connections in the 3.5 GHz Band to Develop IoT, Telemetry, and Critical Infrastructure Applications”).

benefit of aggregating CBRS spectrum (whether PAL or GAA) with exclusively licensed spectrum on other bands. For large service providers, PALs represent *additional capacity* to augment carrier aggregation in high traffic and high ARPU areas – and not the single and only opportunity to customize an internal IoT or other network that incorporates at least a modest amount of interference-protected bandwidth.

Large service providers will have even less incentive to partition or lease portions of license areas larger than census tracts in the absence of strict build-out requirements that are based on geographic coverage and not only on population coverage. The Commission correctly concluded in the *First Report and Order* that its decision “not to impose specific construction requirements for PALs further increases the flexibility and fungibility of these licenses and reduces the barriers to fluid movement between service tiers.”³⁷ However, the Commission decided build-out requirements were unnecessary only because it adopted small license areas and relatively short license terms with no expectation of renewal. Although we could imagine options for geographic build-out rules that could enhance incentives to partition or lease some unused portions of a large license area, it would still be far less spectrum efficient and less conducive to fueling innovation and services by the widest possible range of businesses when compared to the current framework of small areas, complemented by competitive renewal and light-touch leasing.³⁸

³⁷ *First Report and Order* at ¶ 44 (emphasis added).

³⁸ Also, even with built-out requirements, the incentives for PAL holders won't change until the regulations start to apply. For a ten-year term, for example, carriers can hold spectrum for many years before deciding to disaggregate, far beyond the expected life cycle or estimate ROI of small cells or rural deployments.

Finally, even if large service providers would be willing to partition and sell some large portion of a PEA or county-sized PAL, the transaction costs could be prohibitive for most smaller entities. DSA believes the Commission’s 2015 *CBRS Order* correctly observed that “[d]ivesting large, unwanted swaths through secondary market transactions could impose significant transaction costs.”³⁹ Venues and other enterprise wireless users also have little experience with navigating secondary markets for something as complex as partitioning and transferring a license.⁴⁰ Smaller entities may also need spectrum in a quantity or location that is not sufficiently profitable for a national mobile carrier absent additional and strong incentives for that carrier. DSA believes that a more liquid and inclusive secondary market for access to CBRS spectrum by *all* interested parties is best achieved by a combination of small PAL areas (e.g., census tracts) and a market-driven spectrum exchange facilitated by a very streamlined spectrum manager leasing process.

4. SAS Public Disclosure of CBSD Registration Information

NPRM: In the NPRM, the Commission proposes to amend the Part 96 rules to “prohibit SASs from disclosing publicly CBSD registration information that may compromise the security of critical network deployments or be considered competitively sensitive.”

DSA Position: DSA believes that the current rules requiring disclosure by SAS administrators of anonymized CBSD information adequately protect confidentiality and

³⁹ *First Report and Order* at ¶ 100 (“On the other hand, should users of the band desire to provide service within traditional geographical license areas, they can aggregate multiple contiguous census tracts.”).

⁴⁰ See 47 C.F.R. 101.1111, which prescribes the application process for licensing partitioning and disaggregation.

sensitive and competitive network information. Deployment in the GAA and PAL tiers requires that information about the spectral environment and channel availability be made available to the public, especially to potential network operators. Thus, in this rulemaking, the Commission must seek to strike a balance to ensure that CBSD information and frequency usage data are available, while protecting legitimate and documented competitive and network security concerns.

DSA is unaware of any legitimate reason why anonymized CBSD information for this particular band should be shrouded in secrecy while very specific (and carrier-identified) information about other licensed wireless deployments are disclosed in ULS and other Commission licensing databases. Public databases of site-based spectrum licensing information has been standard practice for decades. As Google correctly observed in its comments on the petitions, today virtually all mobile carrier “transceiver locations are visible to passerby, logged by crowd-sourced applications, and publicly documented.”⁴¹ An example is T-Mobile’s base station serving the Commission’s headquarters. Anyone with Internet access can view the basic information on that deployment (eNB ID 51119) including not only the location, but “cell IDs, physical cell identity allocations, air interfaces, uplink and downlink frequencies used, and received signal strength.”⁴² Far from being anonymized, the public can see the name and often the contact information for site-based licensees. Privacy and cybersecurity concerns are

⁴¹ Google Comments, GN Docket No. 12-354, RM-11788, RM-11789 (filed July 24, 2017), at 28.

⁴² *Id.* at 29.

by no means unique to this band and, in fact, should be less of a concern because access points will cover very limited areas.

Public disclosure of the basic CBSD registration information used by SAS operators to calculate protection areas between PALs and access to vacant PAL spectrum on a GAA basis is critical to the integrity and efficient functioning of the CBRS framework. The legitimate reasons to make this information publicly available include enabling potential operators to investigate the feasibility of providing GAA services in an area prior to incurring the cost of attempting to reserve specific spectrum⁴³ and “ensuring that current and prospective users are able to successfully plan their deployments.”⁴⁴ Moreover, because the band’s “use-or-share” requirement makes *unused* PAL spectrum available for potential opportunistic use, aspiring users need to know what frequencies in local areas are vacant. Holding licensees and SAS operators accountable for erroneous or obsolete information that undermine the efficient use of the band is another important policy purpose facilitated by public access, as it is with all FCC licensing databases.

The Commission should not therefore restrict the type of information made available to the public based on concerns that are unsupported in the record. DSA is open to a process that would allow for network operators to access to such information on a confidential basis; however, DSA cautions that restrictions adopted by the

⁴³ *Id.*

⁴⁴ Federated Wireless Comments, GN Docket No. 12-354, RM-11788, RM-11789 (filed July 24, 2017), at 10.

Commission on the type of information that can be disclosed by SAS administrators and the method of access could deter users from entering the band at all.

5. Competitive Bidding Procedures for PALs

a. Assignment of PALs

Background: After reviewing the extensive public record the Commission's concluded in its 2015 *First Report and Order* that the channels in the 3.5 GHz Band will be assigned by a SAS.⁴⁵ The Commission stated that "SAS-controlled frequency assignment is an essential component of the three-tiered authorization framework adopted."⁴⁶ It specifically noted that the automated frequency assignment enabled by the SAS is necessary to ensure the protection of incumbent Federal users from other users in the band.⁴⁷ The Commission required devices be operable across the entire 150 MHz CBRS Band and took steps to ensure a predictable spectrum environment for network planning by PAL licensees by requiring a SAS to:

- Assign geographically continuous PALs held by the same licensee to the same channels in each geographic area, to the extent feasible.⁴⁸
- Assign multiple channels held by the same PAL licensee to continuous channels in the same license area to the extent feasible.⁴⁹

⁴⁵ See *First Report and Order* at 80.

⁴⁶ See *Id.* at 81.

⁴⁷ *Id.*

⁴⁸ 47 C.F.R. 96.25(b)(1)(i)

⁴⁹ 47 C.F.R. 96.25(b)(2)(i)

Section VI of T-Mobile’s 2017 Petition for Rulemaking⁵⁰ included proposed language to allow entities to bid on particular spectrum blocks with the CBRS Band and to make corresponding changes to the Commission’s Part 96 rules. T-Mobile would limit the role of a SAS to “...limiting PAL use to protect incumbent access, if required, and to facilitate GAA access to the band.”⁵¹

NPRM: The NPRM seeks comment on the feasibility and desirability of allowing PAL holders to bid on specific channel assignments, given the “other constraints of the band, including the protection of incumbents.”⁵² Among other things, the Commission asks whether the two-phase auction employed for the 600 MHz forward auction can be applied to the CBRS. It also asks about alternative auction methodologies that “might be appropriate to balance the SAS Administrator’s need to dynamically avoid interference with Priority Access licensee’s desire for certainty and the ability to aggregate contiguous spectrum.”⁵³

DSA Position: DSA believes that allowing PAL licensees to bid on specific channel assignments is neither feasible, desirable, or necessary. Spectrum management through dynamic assignment of PAL frequencies is required to protect incumbent Federal users and is the cornerstone of the CBRS’s three tier of access framework. A two-stage spectrum auction, with the second stage being the “assignment

⁵⁰ RM 111 at 15

⁵¹ *Id.*

⁵² FNPRM at 49

⁵³ *Id.*

phase” of PAL frequencies is a static approach and inconsistent with the unique characteristics and nature of the CBRS framework.

DSA doubts that such a two-stage auction approach will increase investment in the CBRS Band or conversely that the inability of entities to obtain PAL(s) for specific frequencies will discourage such investment. Deep pocketed entities that intend to pursue PALs in urbanized census tracts because they see a good business opportunity will do so regardless. We are seeing such investments today in the creation of the CBRS ecosystem. In less densely populated census tracts, it is hard to envision scenarios where a two-stage auction would add value. The one thing an assignment phase would add here is additional bureaucratic step with its associated costs. We are concerned, though, that in urban census tracts, an assignment phase ups the overall ante required to obtain a PAL and may discourage smaller entities from considering a bid.

Fundamentally, the two-stage auction methodology employed for the 600 MHz forward auction is not a good fit for the CBRS band. The 600 MHz band plan is based on Frequency Division Duplexing, where there is an uplink and downlink blocks, with the predominant use case being for macro cells. The CBRS band plan is based on Time Division Duplexing, where the predominant use case may be small cell in the more urban areas and point-to-multipoint in more rural areas. In general, for the assignment phase of the 600 MHz auction, the more desirable spectrum letter blocks were the ones further removed from the duplex gap and channel 37 to minimize interference. In the

CBRS band, the rationale to reserve specific PAL frequencies would seemingly be to guarantee contiguous channels rather than to minimize interference.

It is important to note the Commission's Part 96 rules require a SAS to assign geographically continuous PALs held by the same licensee to the same channels in each geographic area, to the extent feasible,⁵⁴ and assign multiple channels held by the same licensee to continuous channels in the same 'license area to the extent feasible,⁵⁵ more than adequately meets the requirements for network planning.

In fact, trials and planned deployments of unlicensed LTE-based technologies in the 5 GHz bands for offloading broadband data by Mobile Network Operators (MNO) should dispel any notion that PALs must have access to the same spectrum blocks in the CBRS band on a consistent basis to foster investment. The unlicensed 5 GHz spectrum for supplemental downlink will not necessarily be on same channel(s) all the time. It will depend on the local spectrum environment. Additionally, the size of the 5 GHz channel will vary depending on how much spectrum is available at that location and how much spectrum can be aggregated. The fact that the supplemental downlink channel(s) for unlicensed LTE technologies in the 5 GHz band can vary both in frequency and bandwidth has not stopped MNOs from pursuing such a business strategy should inform the Commission that PAL holding MNOs will be able to perform network planning in the CBRS band even without the certainty of specific frequencies.

⁵⁴ 47 C.F.R. 96.25(b)(1)(i)

⁵⁵ 47 C.F.R. 96.25(b)(2)(i)

Finally, the Commission must consider that access to certain CBRS frequencies in coastal areas is contingent on Federal approval of Environmental Sensor Capability (ESC). DSA is concerned that adoption of static channel assignments would give Federal incumbents a reason to take additional time to digest fully what such a change to the agreement negotiated between the Commission and NTIA previously may mean operationally and politically. The Commission should not take actions that can lead to further delays in PAL licensees and GAA users from accessing all CBRS frequencies across the entire United States.

For these reasons, the Commission should not modify its rules to allow specific PAL frequencies to be bid on.

C. Conclusion

When the Commission approved the existing CBRS rules, there was significant excitement regarding the possibilities of using the dynamic access structure to unlock previously untapped spectrum in ways that have not been possible. The Commission took a courageous step forward, but did so recognizing that the 3.5 GHz band in the United States was, due to the incumbent users of the Federal government and others, different than lower frequency bands that had previously been cleared for broadband wireless services. Requirements to protect U.S. Government services, along with the more limited propagation characteristics of the band, made the band ideally suited to small cell deployment. These factors then drove logical and practical decisions regarding such issues

as shorter PAL terms and smaller geographical size, that then enables more deregulatory approaches including not requiring build-out requirements or showings regarding technology deployment.

Unlike many other bands where the Commission has established rules, the CBRS band has required significant resources to be spent by industry after the rules were established. The Wireless Innovation Form, along with the CBRS Alliance, were established and have worked to establish standards and technical rules, as well as create the business ecosystem necessary to make the CBRS band an innovation marvel and success story. Every sector of the necessary ecosystem has participated in the process and invested significant sums of time and money to bring the CBRS band to the doorstep of success.

The DSA urges the Commission to heed the concerns expressed by the majority of commenters that the changes to the PAL and other rules, first requested by petitioners and now proposed by the Commission, are both unnecessary and counterproductive to enabling the fullest use of the band. These changes will harm the significant investment that has been made by so many parties, and serve only the interests of the few large wireless carriers. As has been clearly established above, even in the case of these carriers, the proposed rules do not enable more deployment of infrastructure or fast deployment, it merely enables the PAL spectrum licenses to be used to exclude deployment by new infrastructure investors.

The CBRS band still provides the opportunity to demonstrate U.S. leadership in both technology and regulatory foresight. The DSA encourages the FCC to allow the existing

work in the CBRS band to move forward without significant changes to the rules. The abundant spectrum future the Commission envisioned is close at hand. The Commission needs merely to allow it to happen.