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

In the Matter of	)	
	)	
Wireless Telecommunications Bureau and	)	GN Docket No. 12-354
Office of Engineering and Technology Seek	)	RM-11788
Comment on Petitions for Rulemaking	)	RM-11789
Regarding the Citizens Broadband Radio	)	
Service	)	

To: Chief, Wireless Telecommunications Bureau
Chief, Office of Engineering and Technology

REPLY COMMENTS OF OPEN TECHNOLOGY INSTITUTE AT NEW AMERICA and PUBLIC KNOWLEDGE

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Executive Summary

The record in this proceeding overwhelmingly demonstrates that the Commission should not proceed to a rulemaking and should summarily reject the changes to the Citizens Broadband Radio Service (CBRS) licensing rules and three-tier framework proposed by Petitioners CTIA and T-Mobile, respectively. At least 9 out of every 10 commenters oppose the radical changes to the Priority Access License (PAL) rules proposed by CTIA and T-Mobile. While opposition to license areas as large as Partial Economic Areas (PEAs), 10-year terms and non-competitive renewal with no build-out requirement spans many industry sectors – from rural and small wireless ISPs, to enterprise wireless, content providers, Internet companies and consumer advocates – support for CTIA's proposed changes to PALs is, not surprisingly, limited to the largest mobile carriers, their largest suppliers (e.g., Qualcomm, Ericsson, Nokia), and the trade associations they dominate (e.g., Telecom Industry Association 5G Americas). Other stakeholders across the wireless and Internet ecosystem recognize the Petitions for what they are: A proposed spectrum industrial policy fashioned to benefit a single business model at the expense of competitors, the economy and the public interest more broadly.

Even more notable is the lack of *any record support at all* for T-Mobile's proposal to eliminate the allocation for General Authorized Access (GAA) and to auction the entire 150 megahertz for exclusive licensing under the preclusive PEA and permanent licensing scheme proposed by both T-Mobile and CTIA. Conspicuous in their silence, not even other CTIA members, or T-Mobile's major suppliers and trade associations, could bring themselves to support the company's self-serving and disruptive proposal to upend the innovate three-tier access scheme at the heart of CBRS.

An overwhelming share of the comments filed agree with OTI and Public Knowledge that the particular PAL changes proposed by CTIA and T-Mobile should be rejected because

they urge the Commission to refashion the rules for the exclusive benefit of one type of provider (a handful of wide-area cellular providers) to the detriment of thousands of other users and use cases, some of which would compete directly with CTIA's members. CTIA and T-Mobile propose to fundamentally redefine PALs to tightly fit the mobile carrier business model and, thereby, to foreclose potential competitors to, or substitutes for, the offerings of the largest mobile carriers.

The record shows strong support for the reality that license areas as large as PEAs or counties are not necessary to stimulate investment in mid-band spectrum and could easily lead to both a narrowing and a net reduction in overall investment and use of the band. The CBRS band was intended to provide complementary licensed and unlicensed spectrum, primarily on a small cell basis, for a diverse range of users and use cases. The CBRS concept of making spectrum available on a "localized" and "targeted" basis is user- and industry-neutral. Under the current rules, mobile carriers are free to aggregate contiguous census tracts, but smaller operators and localized use cases are not hostage to unproven secondary markets transactions with significant transaction costs that depend entirely on whether the big mobile carriers ultimately find it is in their self-interest to support an active secondary market for competitors.

Localized and third-party users and use cases – including rural WISPs, "neutral host" LTE networks, factories customizing machine-to-machine networks, utilities, airports, shopping malls, and sporting arenas – may or may not have the same *capabilities* as a mobile carrier "5G" offering from the user's perspective. That is a judgment the Commission should leave to the marketplace – as the *CBRS Order* wisely did – rather than adopt an industrial policy fashioned by an incumbent industry segment to foreclose diversity, innovation and choice concerning America's wireless future.

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REPLY COMMENTS OF OPEN TECHNOLOGY INSTITUTE AT NEW AMERICA and PUBLIC KNOWLEDGE

New America's Open Technology Institute and Public Knowledge (together the "Public Interest Organizations"), submit these Reply Comments in opposition to the Petitions for Rulemaking filed by CTIA[1] and by T-Mobile USA, Inc. ("T-Mobile")[2] in relation to the Citizens Broadband Radio Service ("CBRS").[3] Comments filed in this proceeding reflect an overwhelming consensus among a very diverse range of nearly 100 companies and trade associations that the Commission should reject Petitioners' proposed changes.

[1] *See* CTIA Petition for Rulemaking, GN Docket No. 12-354 (filed June 16, 2017) ("CTIA Petition").
[2] *See* T-Mobile Petition for Rulemaking, GN Docket No. 12-354 (filed June 19, 2017) ("T-Mobile Petition").
[3] *See Public Notice*, "Wireless Telecommunications Bureau and Office of Engineering and Technology Seek Comment on Petitions for Rulemaking Regarding the Citizens Broadband Radio Service," DA17- 609 (rel. June 22, 2017).

I. THE RECORD SHOWS OVERWHELMING OPPOSITION TO CHANGES TO THE CBRS LICENSING RULES

The record in this proceeding overwhelmingly demonstrates that the Commission should not proceed to a rulemaking and should summarily reject the changes to the Citizens Broadband Radio Service (CBRS) licensing rules and three-tier framework proposed by Petitioners CTIA and T-Mobile, respectively. Roughly 9 out of every 10 commenters oppose the radical changes to the PAL licensing rules proposed by CTIA and T-Mobile. While opposition to license areas as large as Partial Economic Areas (PEAs), 10-year terms and non-competitive renewal without build-out requirements spans many industry sectors – from rural and small wireless ISPs, to enterprise wireless, content providers and consumer advocates – support for CTIA's proposed changes to PALs is, not surprisingly, limited to the largest mobile carriers and a few of their largest suppliers (e.g., Qualcomm, Ericsson, Nokia), and the trade associations they dominate (e.g., Telecom Industry Association 5G Americas). The other stakeholders across the wireless ecosystem recognize the CTIA and T-Mobile Petitions for what they are: A proposed spectrum industrial policy fashioned to benefit a single business model at the expense of the economy and the public interest more broadly.

In contrast to the industry-specific spectrum policy proposed by CTIA and T-Mobile, in the *CBRS Order* the Commission made clear its intention to accommodate a far broader and diverse set of users and use cases, including rural Wireless ISPs (WISPs), utilities, enterprise broadband providers, private LTE networks (including neutral host networks in high- traffic venues), government agencies, schools and libraries. The record is now replete with an outpouring of opposition by all of these stakeholders to the cynical proposal of CTIA – on behalf of a single use case by a few national and regional mobile carriers – to resurrect the carriers' rejected petitions for reconsideration to re-open the rules in order to ensure that PALs

are only affordable and economically viable for the largest mobile carriers.

It should not be surprising that *only* the largest mobile carriers, along their half-dozen largest suppliers and trade associations, support these changes. As WISPA comments: "Maintaining short-term licenses with census tracts will enable meaningful participation for PALs by all potential users – WISPs, private networks, venues, the Internet of Things, and other business cases."[4] We further agree with WISPA (and the dozens of small wireless ISPs that filed) that, taken together, PEA license areas and 10-year license terms with renewal expectancy "would put PALs out of reach for smaller companies that simply cannot afford to compete at auction with large mobile wireless carriers for essentially permanent licenses covering hundreds of thousands of people and thousands of square miles."[5]

The Commission would be wise to retain the industry- and technology-neutral framework of CBRS and reject the CTIA's and T-Mobile's blatant gambit to hobble non-cellular providers and services.

A. The Vast Majority of Commenters Support Maintaining Census Tract Licensing Areas and Oppose Large Areas that Exclude Localized, Smaller and New Users

The vast majority of commenters, representing companies and trade associations in many different industry sectors, oppose CTIA's and T-Mobile's proposal to vastly increase the geographic size of PALs, arguing this will render PALs cost prohibitive for all but the largest mobile carriers. We strongly agree. Commenters including Motorola Solutions, Vivint Wireless, Ruckus, NCTA, Dynamic Spectrum Alliance, WISPA and dozens of rural wireless ISPs assert that increasing PAL service areas to encompass PEAs will make the "interference

[4] Comments of Wireless Internet Service Providers Assn., GN Docket No. 12-354 (filed July 24, 2017) ("WISPA Comments"), at v.
[5] *Ibid.*

protected tier of spectrum cost-prohibitive for all but the largest entities."[6] This will reduce investment and deployments outside of urban core and other high-mobile-ARPU areas, reduce localized innovation, reduce market entry, preclude fixed wireless services in low density and underserved areas, and reduce competition and potential substitutes for one-size-fits-all carrier offerings – all exactly as CTIA and T-Mobile intend.

As Vivint stated, "the combination of dense urban, suburban and rural areas into a single license" is a "major obstacle" for providers other than the largest carriers.[7] And despite its suggestion that the Commission consider county-based PALs, NCTA agrees that "larger license areas typical in licensed mobile bands would be a poor fit for 3.5 GHz" because it would "significantly increase barriers to entry and would therefore depress the development of innovative business models the Commission intended to encourage."[8]

We agree with Starry, Inc. that large license areas are not necessary to stimulate investment in mid-band spectrum and could easily lead to both a narrowing and a net reduction in overall investment and use of the band. The CBRS band was intended to provide licensed and unlicensed spectrum, primarily on a small cell basis, for a diverse range of users and use cases. Starry notes that "CBRS is designed to provide spectrum access where and when it's needed."[9] Whereas big mobile carriers are simply adding this band, among others, to augment capacity, a far wider variety of more localized operators and deployments will depend on the availability of affordable PALs to invest at all.

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[6] Comments of Motorola Solutions Inc., GN Docket 12-354 (filed July 24, 2017) ("Motorola Comments), at 3; *accord* WISPA Comments at 22-24; Comments of Vivint Wireless, Inc., GN Docket No. 12-354 (filed July 24, 2017) ("Vivint Comments"), at 5; Comments of NCTA—The Internet & Television Assn., GN Docket No. 12-354 (filed July 24, 2017) ("NCTA Comments"), at 8.

[7] Vivint Comments at 5.

[8] NCTA Comments at 10.

[9] Comments of Starry, Inc., GN Docket 12-354 (filed July 24, 2017), at 5 ("Starry Comments"). Starry stated: "It might be the case that large license areas are necessary to stimulate investment in low-band spectrum that is designed for coverage and propagates over long distances. That is not the case here."

Under the current rules, small licensing areas encourage investment where capacity is needed, while not precluding others from investing in surrounding but often quite different areas (e.g., the suburbs or office park outside the urban core). Starry notes that "[w]ireless providers will use sophisticated models to determine where in their networks they have the greatest need for additional capacity, and focus their CBRS deployments in those areas." Because incumbent carriers use the band to enhance capacity as needed, "it makes no sense for [carriers] to acquire vast geographic areas they have no need, desire, or intention to serve."[10]

We agree as well with provisional SAS operators, such as Sony and Google, who explained that spectrum management at the census tract-level is manageable and within the technical capability of SAS administrators. Sony reports that it found that any difference in cost or complexity between census tract and PEA geographic units "is minor and extremely manageable with a sufficiently robust database implementation."[11] Google commented that no potential SAS administrators have claimed census tract units are beyond their technical capability.[12]

Google and Starry also agree that managing a large number of small-area licenses should not present any problems for large mobile carriers, since they already have the technical capability and expertise to manage large numbers of licenses. Google notes that mobile carriers that "offer service over a large number of census tracts will already have internal systems in place to manage their extensive spectrum holdings."[13] For example, Sprint and its subsidiary

[10] Starry Comments at 5.
[11] Letter from James Morgan, Director and Counsel, Sony Electronics Inc., to Marlene H. Dortch, FCC Secretary, GN Docket No. 12-354 (filed July 21, 2017), at 1-2.
[12] Comments of Google Inc. and Alphabet Access in Response to Petitions for Rulemaking, GN Docket No. 12-354 (filed July 24, 20178) ("Google Comments"), at 25.
[13] Google Comments at 24. Google added that Sprint and its Clearwire subsidiary already hold more than 30,000 active licenses. *See id.*

Clearwire hold over 30,000 active licenses.[14] Federated Wireless, another provisional SAS administrator, did not note any agreement with the petitioners' assertion that it would be too difficult for SAS administrators to use census tracts as the geographic units.[15]

We agree with Google that using census tracts as the geographic unit does not create interference protection issues.[16] Google's comments clarify that the SAS protects actual CBSD deployments, rather than census tract boundaries, and that the census tract only serves to define the coverage area in the negative in the database: "The formal boundaries of the license area do not define the area to be protected, except to the extent that service outside of license areas is not protected."[17]

We also agree with commenters such as the City of New York and Southern Linc that the already-established geographic area framework works well for urban deployment scenarios. The City of New York comments that the current, "well-articulated licensing framework will enable building owners, stadium operators and even, potentially, municipalities to ensure there are no holes in urban deployments of next generation '5G' wireless technologies, investing in shared infrastructure where no single operator is incentivized to build."[18] There are many areas and use cases in cities that do not correlate with mobile carrier incentives to deploy on CBRS or to customize the connectivity to localized needs. As a result, our groups strongly agree with New York City that the PAL changes proposed by Petitioners are likely to "lead to slower

[14] Google Comments at 24.
[15] *See* Comments of Federated Wireless, Inc., GN Docket No. 12-354 (filed July 24, 2017) ("Federated Wireless Comments"). Despite its agreement with Petitioners that census tracts "could be burdensome," even Nokia, which applied to be an SAS administrator, stated that it is "important that the Commission also explore the desirability for smaller geographic license sizes…." Comments of Nokia, GN Docket No. 12-354 (filed July 24, 2017) ("Nokia Comments"), at 6.
[16] *Contra* Comments of Verizon, GN Docket No. 12-354 (filed July 24, 2017) ("Verizon Comments"), at 8; Comments of Ericsson, GN Docket No. 12-354 (filed July 24, 2017), at 6 ("Ericsson Comments").
[17] Google Comments at 25 ("[T]he claimed actual service area, which is based on calculations of CBSD coverage area, is the area the SAS protects.").
[18] Letter from Michael A. Gamino Jr., Chief Technology Officer, City of New York, to The Honorable Ajit Pai, *et al.*, GN Docket No. 12-354 (filed July 24, 2017) ("New York City Comments"), at 1.

buildouts and more dead zones."[19]

Other commenters also highlight the utility of small-area PALs to urban users and use cases, and especially to "next generation" networks and internet-of-things applications that have commercial as well as public interest benefits. Southern Linc, for example, notes the CBRS band's ability to support "smart city" applications (e.g., video cameras, pollution monitors and gunshot sensors), as well as next generation electric grid applications, including video surveillance of critical assets and the deployment of phasor measurement units to achieve the next level of grid reliability and efficiency.[20]

The census tract framework for geographic areas is particularly well-suited to benefit rural and underserved areas. We agree with the dozens of commenters who suggest census tract geographic areas will encourage investment in rural broadband development – whereas license areas as large as PEAs or even counties would most assuredly preclude rural operators from acquiring a license and thereby also leveraging GAA capacity in the band. Vivint Wireless notes that Southern California has only two PEAs covering the entire Los Angeles and San Diego areas.[21] The Los Angeles PEA stretches east to the Nevada border, with most of its thousands of square miles lying in rural and small town areas outside of L.A. County. Vivint states that it will "enthusiastically invest" in PALs based on the current rules, but large PEAs would make that untenable. The company commented that "the requested changes will harm opportunities for fixed-wireless broadband entrants like Vivint and will lock out new competitors."[22]

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[19] New York City Comments at 2.
[20] Comments of Southern Linc, GN Docket No. 12-354 (filed July 24, 2017) ("Southern Linc Comments"), at 2.
[21] Vivint Comments at 5.
[22] Vivint Comments at 1-2. *See also* Letter from Richard Bernhardt, Managing Director, Bernhardt Communications Company, to Marlene H. Dortch, FCC Secretary, GN Docket No. 12-354 (filed July 24, 2017) ("These proffered changes [by the Petitions] would devastate opportunities for WISPs and many

Affordable spectrum, market entry and competition is particularly needed for rural broadband to flourish. The Rural Wireless Association and NTCA, in joint comments, note that licensing PALs on a PEA basis would cause the price of PALs "to skyrocket and would freeze out many small and rural providers, and particularly new entrants, from the auction process."[23] NTCA and RWA also correctly observe that "entities that wish to serve traditional geographic license areas are free to aggregate multiple contiguous census tracts," and that the Commission correctly reasoned in its unanimous *CBRS Order* that "[d]ivesting large, unwanted swaths through secondary market transactions could impose significant transaction costs"[24] even assuming the big mobile carriers ultimately find it is in their self-interest to support an active secondary market for competitors.

WISPA summed up the negative impact large licensing areas, whether PEAs or even counties, would have on the utility of this band for rural and other low-density and currently underserved areas:

> Simply put, requiring PALs to be auctioned by PEAs will exponentially increase the geographic area and population of auctioned spectrum, dramatically increase the cost of PALs, and assuredly foreclose participation by smaller providers that have a desire to serve smaller areas but lack the ability to bid against . . . multi-billion dollar mobile wireless providers for areas that far exceed the size of smaller, targeted areas.[25]

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others smaller and varied entities . . . to enter, use and provide services under CBRS"), at 2; Letter from Craig Brown, Chief Executive Officer, Blueriver Networking Services, Inc., to Marlene H. Dortch, FCC Secretary, GN Docket No. 12-354 (filed July 24, 2017) ("To have this investment obsoleted in the short term by adopting the recommendations in the CTIA and T-Mobile petitions would be a devastating financial blow for a company such as ours") ("Blueriver Letter"), at 2; Letter from Mike Boley, President and CEO, Wabash Communications, Inc., to Marlene H. Dortch, FCC Secretary, GN Docket No. 12-354 (filed July 24, 2017) ("If adopted, the mobile industry's proposals would undermine our existing investment in 3650-3700 GHz spectrum and inhibit further investment and deployment in the entire 150 Megahertz of spectrum") ("Wabash Letter"), at 2 .

[23] Comments of Rural Wireless Assn. and NTCA—The Rural Broadband Association, GN Docket No. 12-354 (filed July 24, 2017) ("NTCA/RWA Comments"), at 5.

[24] *Amendment of the Commission's Rules with Regard to Commercial Operations in the 3550-3650 MHz Band*, 30 FCC Rcd 3959, 4079 (2015) ("*CBRS Order*") at ¶¶ 94-101.

[25] WISPA Comments at 21.

Filings by dozens of small wireless operators concur with WISPA's position and offer an indication of the targeted investment and deployment in rural and underserved areas that would be stifled if the Commission reversed itself to entertain the mobile industry's proposal. Highspeedlink.net, a wireless internet service provider in Virginia, comments that the CBRS band "has been part of our long term planning to continue to cost effectively serve our community as well as grow our business. Access to this spectrum both in the GAA form as well as PAL will allow us to not only grow our investments even more so, but will allow us to move into a more secure spectrum space that will allow our company to offer more services."[26] Kentucky-based WISP Fastnet Wireless comments that "Once CBRS is complete we plan on making a huge overlay of our existing network to give even more speeds to existing customers and enhancing coverage to leave nobody unserved."[27] WISPs are already investing in rural deployment based on the current geographic area framework, and this framework is particularly suited to encourage and sustain such development.

License areas as large as PEAs or counties will almost certainly leave PAL spectrum unused for many years, and perhaps indefinitely, in low-density and hence low-ARPU environments outside of central urban areas, shopping districts, and high-traffic venues. Smaller ISPs and more locally-focused wireless service providers do not have the capital or business case to outbid national or regional mobile carriers for licenses that could be dozens or even hundreds of times larger than needed. As the record overwhelmingly demonstrates, traditional

[26] Letter from James Bouse, Owner, Brazos WiFi, to Marlene H. Dortch, FCC Secretary, GN Docket No. 12-354 (filed July 24, 2017) ("All of our new tower sites are being outfitted with LTE systems with the expectation that the CBRS band will allow us to better service those folks which are hard to reach"); Letter from TecInfo Communications, LLC, to Whom It May Concern, GN Docket No. 12-354 (filed July 24, 2017) ("Additional investment has been made, testing equipment operating at 3.65-3700MHZ utilizing the CBRS band. TecInfo Communications, along with many industry peers are prepared to continue investing into network expansion, reaching many more unserved rural Americans"), at 3

[27] *See* Wabash Letter at 2 ("As a small fixed wireless provider in rural Ohio we have invested heavily in equipment operating in the 3650-3700 GHz and are currently adding equipment upgrades to provide faster rural internet service").

wide-area, cellular licensing scheme would reverse the purpose of this innovative CBRS band. It would foreclose the ability of the largest possible number of businesses, venues, small providers, community anchor institutions and other entities to self-provision or customize a localized, high-capacity data network for a myriad of purposes, including mobile data offload, private LTE networks, machine-to-machine implementations, smart city applications and untold other local connectivity needs.

Finally, we note that NCTA and Charter suggest that the Commission consider county-based licensing areas. Replacing census tracts with county-based PALs, they assert, "would significantly reduce the administrative burden and risk" by reducing the total number of license areas from 74,000 to 3,150.[28] OTI and Public Knowledge disagree that PALs as large as counties would be substantially less preclusive. Auctioning PALs as large as counties create the same barriers to entry, innovation and investment as licenses the size of PEAs, only somewhat less so.[29] As a practical matter, PALs the size of counties would exclude virtually all other small wireless operators and use cases from acquiring interference protection as a cornerstone of a 3.5 GHz deployment. For a national or regional mobile carrier, the most desirable counties are those that contain the 50 largest metropolitan markets. But these same counties typically include, in addition, hundreds and in some cases thousands of square miles of diverse non-urban areas with significantly varying conditions – areas where big mobile carriers have little incentive to use this band to add capacity, except possibly along busy highways or in a handful of high-traffic areas. Small ISPs, enterprise wireless providers and other localized use cases would be no more able to acquire most counties than they would a PEA.

While there are roughly 3,000 counties across the United States, many of these counties

[28] Comments of NCTA at 8-10; Comments of Charter Communications Inc., GN Docket No. 12-354 (filed July 24, 2017) ("Charter Comments"), at 3.
[29] *See* Comments of OTI and Public Knowledge, GN Docket No. 12-354, RM-11788, RM-11789 (July 24, 2017) ("OTI/PK Comments"), at 20.

cover enormous areas that include rural, suburban, exurban and urban areas all within one county. Los Angeles County, for example, is home to 10,137,915 people and stretches roughly 4,057 square miles.[30] The county also incorporates vastly different types of areas. Hollywood (with sprawling studio complexes that might use a PAL for customized networks), downtown Los Angeles, Long Beach, and large parts of the Angeles National Forest–San Gabriel Mountains National Monument are all within Los Angeles County.[31]

Similarly, the neighboring county of San Bernardino County includes the city of San Bernardino (population of 216,239),[32] on the edge of metro Los Angeles, but it also sprawls eastward, covering over 20,000 square miles[33] of small towns, vast empty stretches of highway, as well as the Mojave National Preserve.[34] If you look at Coconino County, Arizona (which stretches 18,618 square miles),[35] similar issues would arise for an area that includes Flagstaff, Ariz. (population of 71,459)[36] as well as the Grand Canyon National Park and large stretches of empty areas dotted with small towns.

These are just three examples of the similar problems auctioning PALs the size of counties could bring for a system that was designed to enable both small wireless ISPs and a

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[30] See QuickFacts: Los Angeles County, U.S. Census Bureau, *available at* https://www.census.gov/quickfacts/fact/table/losangelescountycalifornia/LND110210.
[31] See Google Maps: Los Angeles County, *available at* https://www.google.com/maps/place/Los+Angeles+County,+CA/@34.466741,-118.7652409,9z/data=!4m5!3m4!1s0x80dd2ad30164cd31:0x837d28d6cfbd392a!8m2!3d34.0522265!4d-118.2436596.
[32] See QuickFacts: San Bernardino city, U.S. Census Bureau, *available at* https://www.census.gov/quickfacts/fact/table/sanbernardinocitycalifornia,US/PST045216.
[33] See QuickFacts: San Bernardino County, U.S. Census Bureau, *available at* https://www.census.gov/quickfacts/fact/table/sanbernardinocountycalifornia/INC110215.
[34] See Google Maps: San Bernardino County, *available at* https://www.google.com/maps/place/San+Bernardino+County,+CA/@34.7852791,-117.2529163,8z/data=!4m5!3m4!1s0x80c52a8ae8311be5:0xa438bdbc918edca!8m2!3d34.9592083!4d-116.419389.
[35] See QuickFacts, Coconino County, Ariz., U.S. Census Bureau, *available at* https://www.census.gov/quickfacts/fact/table/coconinocountyarizona/RHI325216.
[36] See QuickFacts: Flagstaff city, Arizona, U.S. Census Bureau, *available at* https://www.census.gov/quickfacts/fact/table/flagstaffcityarizona/PST045216.

wide variety of new users and use cases to bring connectivity to small, targeted areas. Licenses for counties as large and diverse as Los Angeles or San Bernardino Counties will only be affordable to incumbent wide-area mobile carriers, since the licenses that will be valued entirely by the dense city and suburban portion of the county. The ability to tailor PALs to be the size of a corporate or college campus, shopping mall or public venue, would be completely undermined by licenses as large as counties.

B. The Record Demonstrates Strong Support for Maintaining Relatively Short Licensing Terms with No Automatic Renewal Expectancy

The Petitioners propose to replace limited-term PALs with 10-year license terms that renew automatically. The vast majority of commenters agree that turning PALs into the equivalent of traditional cellular industry licenses -- particularly in combination with larger licensing areas – would effectively preclude entities other than the largest, incumbent mobile carriers from acquiring PALs. While some commenters outside the cellular industry express support for somewhat longer terms, most agree that ten-year terms with automatic renewal and no build-out requirements undermines the goals the Commission established in its unanimous *CBRS Order* in 2015. The record demonstrates widespread support from diverse parties for maintaining relatively short licensing terms and for a competitive renewal process that allows new entrants and new technologies to gain access to PALs based on a marketplace that is likely to evolve rapidly over time. The record continues to strongly support the balance adopted by the Commission in the *CBRS Order*: "Non-renewable, short-term licenses are an essential component of the overall framework . . . permitting periodic, *market-based reassignment* of these rights in response to changes in *local conditions and operator needs*."[37]

[37] *CBRS Order* at ¶ 44 (emphasis added).

We agree with Starry, Google, Ruckus, Motorola, NCTA, NTCA/RWA and many other commenters expressing the concern that 10-year license terms with renewal expectations will lead to spectrum warehousing. Long and effectively permanent license terms reduce the incentive for license holders to acquire only the spectrum they plan to put to work in a timely manner.[38] Google correctly states that longer terms lead to the risk that licensees will "warehouse their rights to the protected spectrum, rather than deploying service or subleasing to potential competitors who might win away the licensees' customers with better or less expensive services."[39] RWA and NTCA note that ten-year terms without strict build-out requirements "would encourage large providers to accumulate CBRS spectrum in contravention of 309(j) of the Act 'to prevent stockpiling or warehousing of spectrum'."[40] We also agree with Motorola that long license terms and non-competitive renewals "would ensure that valuable interference protected spectrum would be controlled by single entities for extended periods of time, without any competition in large areas" and will "stunt innovation in the band."[41]

Whether or not warehousing becomes a problem, most commenters agree the proposed changes would foreclose other new uses and users from gaining access to PALs. As the Dynamic Spectrum Alliance states, long license periods with renewal expectancy "concentrate spectrum access costs into a single up-front barrier to entry, potentially barring many local businesses and rural carriers" from use of the band.[42] We further agree with Starry that "[l]onger license terms in CBRS, especially coupled with large license areas, will reduce the availability of spectrum for other uses, thus limiting the pool of companies that could invest in

[38] *See* Starry Comments at 5; Ruckus Comments at 8.
[39] Google Comments at 22; *see* RWA/NTCA Comments at 9 (RWA and NTCA note that ten-year terms without strict build-out requirements "would encourage large providers to accumulate CBRS spectrum in contravention of 309(j) of the Act 'to prevent stockpiling or warehousing of spectrum.'")
[40] RWA/NTCA Comments at 9.
[41] Motorola Comments at 4-5.
[42] Comments of Dynamic Spectrum Alliance, GN Docket No. 12-354 (filed July 24, 2017) ("DSA Comments"), at 12.

the band and minimizing overall investment."[43]

The record demonstrates that the exact kinds of investment that relatively short and non-renewable terms were intended to produce would be suppressed if the proposed mobile industry changes are adopted. We agree with the County of Bland, Virginia that "[c]hanging these rules at this point . . . creates concern."[44] Governments and municipalities such as Bland County, small businesses, and taxpayers benefit from shorter license and stricter renewal terms.[45] We agree with commenters, including Ruckus and Leidos, who believe the result of 10-year terms with renewal expectancy, combined with large licensing areas, will be to drive small operators, start-ups, market entrants, innovators and individual enterprises and local institutions (such as schools, libraries, public parks, harbors, et al.) out of the PAL market.[46]

Many comments also note that like small licensing areas, short terms and competitive re-bidding for PALs do not foreclose access to PALs for the big mobile carriers. As the Rural Wireless Association and NTCA comment, the current framework does not foreclose nationwide mobile wireless providers from participating – it just does not give a particular small

[43] Starry Comments at 5; *see also* Comments of Ruckus, a business unit of Brocade Communications, Inc., GN Docket No. 12-354 (filed July 24, 2017) ("Ruckus Comments"), at 8. Ruckus states:

> If Priority Access is licensed at the PEA level with a virtually perpetual duration, it would rule out that access for all aside from those companies whose business models are based on selling services covering huge areas over very long periods. In effect, these changes would create a PAL tier tailored to the specific needs of four companies, while blocking access to the thousands, perhaps tens or hundreds of thousands, of smaller companies and entities who could otherwise benefit from Priority Access.

[44] Comments of Bland County, VA, GN Docket 12-354 (filed July 24, 2017), at 1.

[45] *See* OTI/PK Comments at 25-26; *see also* Ruckus Comments at 8:

> If the opportunity to access the CBRS spectrum with the certainties and protections afforded at the PAL tier is taken away from all of the smaller deployers and operators (e.g. enterprises, universities, hospitals, hotels, municipal authorities, industrial manufacturers, rural Wireless ISPs, etc.) it may cause them to rethink their entire strategy for utilizing the CBRS band.

[46] Ruckus Comments at 8 ("[T]hese changes would create a PAL tier tailored to the specific needs of four companies, while blocking access to the thousands, perhaps tens or hundreds of thousands, of smaller companies and entities"); Comments of Leidos, Inc., GN Docket No. 12-354 (filed July 24, 2017) ("Leidos Comments"), at 2 ("[U]sing PEAs for licensing and increasing the term to 10 years are factors that are likely to make PALs much less attainable and will further alienate the public and private system operators from the band.").

group of companies an unfair competitive advantage."[47]

It's notable that many comments question whether 10-year license terms or renewal are necessary in this particular band. NCTA observes that if PAL areas remain smaller than PEAs, "CTIA and T-Mobile have not adequately explained why they would require the same ten-year term to build out a substantially smaller area." Similarly, RWA and NTCA assert that in its Order on Reconsideration, the Commission correctly concluded that given the transmit power limits of CBRS, "economics and upgrade cycles for small cell use may resemble those for Wi-Fi deployments rather than traditional macro cell deployments."[48] In the urban and high-traffic areas most conducive to mobile carrier deployment, the band will be one of several adding capacity over a relatively small area using a type of micro or pico cell. The Dynamic Spectrum Alliance correctly observes that unlike traditional cellular bands – where mobile carriers could not tolerate "coverage gaps" – "because all 3.5 GHz equipment must be capable of operating in any 3.5 GHz channel, even the expiration of a PAL term need not strand a licensee's investment in that local area – it may continue to operate in GAA spectrum in the same way it operated in PAL spectrum."[49]

We also agree with NCTA and other commenters expressing the concern that Petitioners are proposing to turn PALs into a "perpetual license" without accompanying performance requirements.[50] Our groups agree with NCTA's warning that long terms with an expectation of renewal, but without strict build-out requirements, "would enable spectrum squatting and reduce interest in the band from non-traditional participants."[51] The Commission correctly concluded in the *CBRS Order* that its decision "not to impose specific construction

[47] RWA/NTCA Comments at 8-10.
[48] *Amendment of the Commission's Rules with Regard to Commercial Operations in the 3550-3650 MHz Band*, 31 FCC Rcd 5011 (2016) ("*CBRS Recon Order*"), at ¶ 45.
[49] DSA Comments at 13.
[50] NCTA Comments at 12.
[51] NCTA Comments at 8.

requirements for PALs further increases the flexibility and fungibility of these licenses and reduces the barriers to fluid movement between service tiers."[52] However, as NCTA notes, the Commission decided build-out requirements were unnecessary only because it adopted relatively short license terms with no expectation of renewal. We reiterate our belief that if the Commission proceeds to a NPRM that considers longer license terms and/or automatic renewal, the agency should also impose strict build-out requirements not on an overall population basis, but on a census tract basis.[53]

II. THE RECORD DEMONSTRATES OVERWHELMING OPPOSITION TO CHANGING THE THREE-TIER CBRS FRAMEWORK AND TO AUCTIONING ANY OF THE 80 MHZ ALLOCATED FOR GENERAL AUTHORIZED ACCESS

There appears to be *no record support at all* for T-Mobile's proposal to eliminate the allocation for General Authorized Access (GAA) and to auction the entire 150 megahertz for exclusive licensing shaped around the needs of the dominant mobile carriers. No other comments support T-Mobile's proposal to auction the entire 3550-3700 MHz band, including the other national mobile carriers, or even T-Mobile's own major suppliers and trade associations that filed comments supporting other aspects of T-Mobile's Petition.

An overwhelming majority of commenters affirmatively oppose T-Mobile's proposal, while some others ignore it. The comments of Verizon, AT&T, U.S. Cellular do not mention T-Mobile's proposal.[54] Nor do the comments of Qualcomm, Nokia and Ericsson. Additionally, the major trade associations representing the mobile industry – including petitioner CTIA – did

[52] *CBRS Order* at ¶ 44 (emphasis added).
[53] OTI/PK Comments at 27.
[54] *See* Verizon Comments; Comments of AT&T Services, Inc., GN Docket No. 12-354 (filed July 24, 2017) ("AT&T Comments"); Comments of United States Cellular Corporation, GN Docket No. 12-354 (filed July 24, 2017) ("US Cellular Comments").

not endorse T-Mobile's plan to eliminate the GAA portion of the band.[55]

Our groups strongly concur with the Dynamic Spectrum Alliance, WISPA, NCTA, Ruckus, Federated Wireless, Rise Broadband, rural wireless operators and many other stakeholders that strongly oppose T-Mobile's proposal. We agree with DSA that T-Mobile's proposed changes would be a "disaster for the many businesses that have invested in the band in reliance on a three-tiered framework with robust GAA,"[56] and we agree with WISPA that it "would change the fundamental purpose of the band."[57] A combination of licensed and unlicensed spectrum is necessary for sustainable growth and development throughout the wireless ecosystem. We further agree with DSA that "the unlicensed and lightly-licensed bands . . . [are] providing low cost broadband solutions to billions of people around the world; supporting billions of devices; creating vibrant competition between thousands of companies; inventing new applications and even whole industries around the access to this service. And ultimately, adding trillions of dollars to the global economy."[58]

Our groups agree with NCTA that the Commission's 2015 decision was "well-supported by the record. As many commenters expressed, innovators must have access to sufficient GAA spectrum in order to maximize 3.5 GHz investment."[59] CBRS is explicitly a technologically neutral service and "could potentially engender a wide diversity of network deployments, including by some nontraditional entrants that do not operate mobile networks in other spectrum."[60] We agree with NCTA that "[s]ufficient access to GAA spectrum that can be used

[55] *See* CTIA Petition; Comments of 5G Americas on T-Mobile Petition, GN Docket No. 12-354 (filed July 24, 2017) ("5G Americas Comments"); RWA/NTCA Comments; Comments of the Telecommunications Industry Association, GN Docket No. 12-354 (filed July 24, 2017) ("TIA Comments"); Comments of the Enterprise Wireless Alliance, GN Docket No. 12-354 (filed July 24, 2017) ("EWA Comments").
[56] DSA Comments at 14.
[57] WISPA Comments at 26.
[58] DSA Comments at 18.
[59] NCTA Comments at 13.
[60] *CBRS Order* at ¶ 228.

alone or in coordination with PALs is critical to the 3.5 GHz band ecosystem."[61] Ensuring a substantial amount of open and opportunistic GAA spectrum in every market is likely a prerequisite to realizing the benefits of a mass market for interoperable and dynamic frequency devices that can operate on either a PAL or GAA basis.

T-Mobile's proposal would be a particularly low blow to rural America and ongoing efforts to narrow the digital divide in low-density exurban and small town areas. It is important to realize that the 3650-3700 MHz band has been lightly licensed for nearly a decade and is already encumbered by fixed wireless deployments, mostly in rural areas, by WISPs, utilities, and other enterprise users. As WISPA and other small rural wireless ISPs point out, the Commission acknowledged in the *CBRS Order* that in reliance on the light-licensing framework that currently governs 3650-3700 MHz, there have been "substantial investments in equipment deploying various services in the band."[62] Accordingly, we agree with NCTA that with regards to this band, "the Commission correctly concluded that GAA was better positioned than PAL users to share these frequencies [3650-3700 MHz] with grandfathered wireless broadband licensees both during and after the transition period."[63]

Federated Wireless observes that the T-Mobile's proposal is nothing more than a "bald-faced attempt to transform the innovative three-tier sharing framework into a traditional exclusive licensing scheme."[64] Angie Communications calls T-Mobile's gambit "utterly disturbing and anti-competitive."[65] We agree with WISPA that T-Mobile is "simply wrong in its belief that converting the band to 150 megahertz of exclusively licensed spectrum will have

[61] NCTA Comments at 12. NCTA, citing Microsoft, also asserts that "[a] thriving GAA ecosystem – which includes device makers, chip makers, component suppliers, and cariers – requires a critical mass of GAA spectrum available in every [market] nationwide." *Id.* at 13.
[62] *CBRS Order* at ¶ 4074.
[63] NCTA Comments at 14; *see also* WISPA Comments at 26-30.
[64] Federated Wireless Comments at 5.
[65] Comments of Angie Communications USA, Inc., GN Docket No. 12-354 (filed July 24, 2017) ("Angie Comments"), at 3.

positive effects."[66] Auctioning the GAA portion of the band is not necessary to encourage carriers to invest in and deploy 5G technologies in the band, and would in reality only serve to depress investment in the band by further foreclosing its use by smaller wireless ISPs and a wide variety of other wireless service providers and venues.

III. THERE IS STRONG SUPPORT FOR MAINTAINING TRANSPARENCY OF CBSD REGISTRATION INFORMATION

A number of other major commenters joined the Public Interest Organizations in strongly opposing the proposals by CTIA and T-Mobile to rescind public disclosure of the basic CBSD registration information used by SAS operators to calculate protection areas both between PALs and for the purpose of facilitating access to vacant PAL spectrum on a GAA basis. WISPA correctly observes that CBRS is not an unlicensed service – and that public databases of spectrum licensing information has been standard practice for decades. "CBRS is 'licensed by rule,' such that the SAS essentially takes the place of ULS in identifying where the spectrum is in use," WISPA explains.[67] This is an essential point: Each SAS operates on delegated authority to register and record licensing information on use of the public's airwaves.

There is no reason that the anonymized CBSD information for this particular band should be shrouded in secrecy while other apparently more expensive and high-power systems are disclosed in ULS and other Commission licensing databases. The so-called privacy and cybersecurity claims of Petitioners, to the extent they are sincere in the slightest, are not unique to this band. Google correctly points out that today virtually all mobile carrier "transceiver locations are visible to passerby, logged by crowd-sourced applications, and publicly

[66] WISPA Comments at 27.
[67] *Id.* at 31.

documented."[68] 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."[69] Far from being anonymized, the public can see the name and often the contact information for site-based licensees.

Not only do the registrations for CBSD deployments present no greater security or competitive concerns but, as Google correctly states (as we did in our comments), "there are legitimate reasons to make this information publicly available, such as enabling potential operators to investigate the feasibility of providing GAA services in an area prior to incurring the cost of attempting to reserve specific spectrum."[70] Federated Wireless similarly suggests the Commission take the privacy and security concerns of CTIA and T-Mobile into account, "while also ensuring that current and prospective users are able to successfully plan their deployments."[71] Holding licensees and SAS operators accountable for erroneous or obsolete information that can over time undermine the efficient use of the band is another important policy purpose facilitated by public access, as it is with all FCC licensing databases.

[68] Google Comments at 28.
[69] *Id*. at 29.
[70] *Ibid*.
[71] Federated Wireless Comments at 10.

IV. CONCLUSION

Our groups urge the Commission to respect the views of the vast majority of parties in the record and summarily dismiss the CTIA and T-Mobile proposals and focus on an expedited implementation of the rules as adopted in 2015 and 2016. The handful of comments supporting a rulemaking to adopt the radical changes to the PAL licensing rules proposed by Petitioners are limited to the mobile carriers and a few of their major suppliers and trade associations. No other stakeholders support the proposed combination of PEA licensing areas, 10-year license terms and renewal expectancy without strict build-out requirements. For its part, T-Mobile's separate proposal to reallocate the GAA portion of the 3.5 GHz band for auction has absolutely no support in the record, not even from the cellular industry parties that filed comments. We urge the Commission to reiterate that the purpose of this three-tier and small cell band is to facilitate spectrum access for a wide variety of uses and users, including smaller wireless operators and other entities that seek the interference protection of one or more PALs to address local connectivity needs – and who would be foreclosed if PALs are fashioned to be optimal for a handful of large mobile and wide-area carriers.

Respectfully submitted,

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