

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

In the Matter of)	
)	
Amendment of the Commission's Rules with)	GN Docket No. 12-354
Regard to Commercial Operations in the)	
3550-3650 MHz Band)	
)	
Petition for Rulemaking to Amend the)	RM-11788
Commission's Rules Regarding the Citizens)	
Broadband Radio Service in the)	
3550-3700 MHz Band)	
)	
Petition for Rulemaking to Maximize)	RM-11789
Deployment of 5G Technologies in the)	
Citizens Broadband Radio Service)	

**NCTA – THE INTERNET & TELEVISION ASSOCIATION
COMMENTS ON PETITIONS FOR RULEMAKING**

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I. INTRODUCTION AND SUMMARY.

The Commission and industry have arrived at a critical moment for the 3.5 GHz band. The band has already attracted significant interest from both traditional and non-traditional participants in the wireless space, and the Commission is poised to further ease the path to investment and ultimate deployment. In acting on the petitions for rulemaking filed by CTIA and T-Mobile, the Commission should balance efforts to attract investment by prospective licensees and to ease administrative burdens with preserving the core features of the innovative 3.5 GHz framework that have already garnered such broad interest. Specifically, the Commission can make modest changes to the rules and support the development of 5G services in the band while continuing to preserve: (1) low barriers to entry in the form of smaller license areas than in traditional licensed bands, and (2) a balance of general authorized access (GAA) and priority access license (PAL) spectrum accessible under the same technical rules.

Although NCTA – The Internet & Television Association (NCTA) supports the adoption of somewhat larger geographic areas and longer license terms for PALs, the Commission should not go so far as to make over 3.5 GHz in the form of a traditional licensed band. Smaller geographic areas keep barriers to entry low and, as the Commission previously found, will make the band “hospitable to a wide variety of users, deployment models, and business cases, including some solutions to market needs not adequately served by our conventional licensed or unlicensed rules.”¹ County-sized license areas strike the right balance between attracting PAL investment while ensuring the band remains accessible for non-traditional participants and

¹ *Amendment of the Commission’s Rules with Regard to Commercial Operations in the 3550-3650 MHz Band*, Report and Order and Second Further Notice of Proposed Rulemaking, 30 FCC Rcd 3959, 3962 ¶ 7 (2015) (2015 Order).

inventive business models. In contrast, adopting Partial Economic Area (PEA)-sized license areas and virtually perpetual licenses with no performance requirements would likely depress innovation and interest among those initially attracted by the band's low barriers to entry.

The Commission should also continue to preserve sufficient access to GAA spectrum and reject T-Mobile's proposal to auction the entire 3550-3700 MHz band. As the Commission predicted, the 3.5 GHz band has drawn attention from a wide variety of stakeholders because of the flexibility it offers to network operators to rely on exclusive spectrum, spectrum licensed by rule, or some combination of the two, as inputs for their services. This flexibility is predicated on the assumption that a balance of both types of spectrum will be available in every market. The Commission struck the right balance—up to 70 MHz reserved for PAL use with at least 80 MHz available for GAA—in the current rules and should not upset that balance at T-Mobile's request.

Minor changes to the technical rules, on the other hand, could improve the investment climate without undermining key characteristics of the band. Specifically, the emissions limit adjustments proposed by Qualcomm would facilitate channel bonding by both PAL and GAA operations, which will be critical to supporting growing demand for mobile—and particularly mobile video—services. NCTA also supports the proposal to protect sensitive Citizens Broadband Radio Service Device (CBSD) registration information from public disclosure, provided that GAA and PAL users can access sufficient information through the Spectrum Access System (SAS) databases to plan their network deployments.

Following the path laid out above, the Commission can strike the right balance between preserving core features of the existing framework and adopting modest changes to improve the investment climate and streamline administrative impediments. The Commission should move

forward expeditiously with such appropriately balanced changes to provide stakeholders with the regulatory certainty they need to continue their investment in standards, equipment, and eventual deployment.

II. MOTIVATED BY THE COMMISSION’S INNOVATIVE APPROACH TO SPECTRUM MANAGEMENT, MANY DIVERSE INVESTORS ARE PREPARING TO DEPLOY 3.5 GHZ SERVICES IN THE NEAR TERM.

The unique physical and regulatory characteristics of the 3.5 GHz band are already stimulating interest by both traditional and non-traditional participants in the wireless ecosystem, spurring competition and consumer benefits. The Commission specifically intended the overall regulatory picture in the 3.5 GHz band to attract interest from new entrants and non-traditional players. It noted in the *2015 Order* that the “regulatory adaptability” of the band “should make [it] hospitable to a wide variety of users, deployment models, and business cases, including some solutions to market needs not adequately served by our conventional licensed or unlicensed rules.”² And indeed, the Commission’s approach significantly reduces barriers to entry and enables flexibility. Network operators can choose to deploy in the GAA tier without obtaining an individual license if that suits their needs, or obtain a PAL covering a targeted geographic area—consistent with the propagation characteristics of the band and proposed small cell deployment model—for a discrete license term without many of the costs and obligations imposed on traditional licensed bands. Moreover, because the Commission adopted the same technical rules for PAL and GAA operations, network operators can use the same equipment to

² *Id.* ¶ 7.

operate PAL, GAA, or blended networks according to their operational needs, and easily adjust their deployments as those needs change.

The cable industry has expressed interest in 3.5 GHz specifically because of the unique framework proposed and adopted by the Commission.³ Several of NCTA's members have followed through on their interest by committing significant time and resources to standards development and testing efforts. Charter, Comcast, and CableLabs are all members of the CBRS Alliance, which is working toward LTE-based technology developments and a product certification program in the 3.5 GHz band.⁴ Through CableLabs, the industry is also participating in the Wireless Innovation Forum (WinnForum), a body developing CBRS standards.⁵ The WinnForum expects to wrap up Release 1 of the CBRS specification in Fall 2017.⁶ CableLabs and MSOs are also conducting testing and trials, supported by equipment developed by at least seven vendors.⁷

³ See Comments of the National Cable & Telecommunications Association, GN Docket No. 12-354, at 11 (filed July 14, 2014) (NCTA Comments); Letter from All Points Broadband, et al. to Chairman Ajit Pai, Commissioner Mignon Clyburn, and Commissioner Michael O'Rielly, FCC, GN Docket No. 12-354 (June 1, 2017) (All Points Broadband, et al. Letter).

⁴ CBRS ALLIANCE, <https://www.cbbsalliance.org/> (follow links to pages on Mission and Members).

⁵ WIRELESS INNOVATION FORUM, *Current Members*, http://www.wirelessinnovation.org/Current_Members.

⁶ Letter from Lee Pucker, CEO, Wireless Innovation Forum, to Marlene H. Dortch, Secretary, FCC, GN Docket No. 12-354, at Attachment slide 5 (filed May 26, 2017)

⁷ See, e.g., Grant of Experimental Special Temporary Authorization to CableLabs, Call Sign WJ9XON, for frequency 3550-3700 MHz (granted Apr. 3, 2017), [https://apps.fcc.gov/els/GetAtt.html?id=189929&x=](https://apps.fcc.gov/els/GetAtt.html?id=189929&x=;).; Martha DeGrasse, *Comcast and Huawei to Test 3.5 GHz Radio This Month*, Enterprise IOT Insights (June 5, 2017),

The unique rules for 3.5 GHz have also drawn significant attention and investment by a wide variety of other players, including traditional wireless industry interests. A search of the Commission’s experimental authorization database shows more than 200 experimental authorizations granted for frequencies between 3550-3700 MHz since the Commission adopted its *2015 Order*.⁸ The sheer number of companies participating in standards development—45 companies participating in the WinnForum and 66 companies joining the CBRS Alliance—demonstrates interest by a diverse group of stakeholders.⁹ Many 3.5 GHz stakeholders, including non-traditional players like Ruckus, Federated Wireless, Google, and GE, alongside the chip- and device-makers for traditional mobile wireless interests, including Ericsson, Nokia, and Qualcomm, demonstrated 3.5 GHz products and services at Mobile World Congress 2017.¹⁰

<http://enterpriseiotinsights.com/20170605/news/comcast-and-huawei-to-test-3-5-ghz-radio-this-month-tag4>.

⁸ Search performed using OET’s experimental authorization generic search page on July 14, 2017.

⁹ WIRELESS INNOVATION FORUM, *Current SSC Members*, <http://www.wirelessinnovation.org/ssc-committee-members>; CBRS ALLIANCE, *Members*, <https://www.cbrsalliance.org/>; *see also* All Points Broadband, et al. Letter.

¹⁰ CBRS ALLIANCE, *CBRS Alliance Member Company Demos at Mobile World Congress 2017* (Feb. 24, 2017), <https://www.cbrsalliance.org/single-post/2017/02/24/CBRS-Alliance-Member-Company-Demos-at-Mobile-World-Congress-2017>; *see also* Pete Smyth, *Momentum Builds for 3.5 GHz Mobility in 2018*, CableLabs Blog (Mar. 30, 2017), <http://www.cablelabs.com/momentum-builds-3-5-ghz-mobility-2018> (noting MWC 2017 demonstrations by AirSpan, Accelleran, Juni, Nokia and Sercom) (CableLabs Blog).

AT&T, T-Mobile, and Verizon are all conducting 3.5 GHz trials, including for 5G.¹¹ In fact, chips and equipment have already been developed that support 3.5 GHz.¹²

CTIA and T-Mobile claim that to best support the development of 5G services in the 3.5 GHz band, the Commission must remake this innovation space into just another licensed wireless band.¹³ But the amount of interest and investment in the band from traditional mobile network operators and their vendors contradicts their position that dramatic rule changes are necessary to promote investment in 5G. As discussed below, NCTA agrees that modest changes to the existing 3.5 GHz framework would promote investment and reduce administrative costs, but the idea that the Commission must make the drastic changes that CTIA and T-Mobile seek for 5G to thrive in this space strains credulity.

The carriers' position is also premised on the mistaken idea that only traditional licensed technologies can deliver 5G services. But 5G encompasses all next-generation wireless

¹¹ Monica Allevan, *T-Mobile Files to Test 3.5 GHz Gear, Sees Band as 'Ideal' for 5G*, FierceWireless (Apr. 5, 2017); Monica Allevan, *Verizon Aims to Deploy Small Cells in 3.5 GHz When Practical*, FIERCEWIRELESS (Mar. 10, 2017); Monica Allevan, *AT&T Continues Quest to Test at 3.5 GHz*, FIERCEWIRELESS (Mar. 5, 2017).

¹² CableLabs Blog (noting that Qualcomm's latest Snapdragon modem released in October 2016 supports 3.5 GHz); Monica Allevan, *A Year In, What's Happening with Google, Verizon, Nokia, and the 3.5 GHz CBRS Band?*, FIERCEWIRELESS (Apr. 7, 2017), <http://www.fiercewireless.com/wireless/a-year-what-s-happening-google-verizon-nokia-and-3-5-ghz-cbrs-band> (noting that SpiderCloud and Nokia both have products that support 3.5 GHz).

¹³ See CTIA Petition for Rulemaking to Amend the Commission's Rules Regarding the Citizens Broadband Radio Service in the 3550-3700 MHz Band, GN Docket No. 12-354, RM-11788, at 4-6 (filed June 16, 2017) (CTIA Petition); T-Mobile Petition for Rulemaking to Maximize Deployment of 5G Technologies in the Citizens Broadband Radio Service, GN Docket No. 12-354, RM-11789, at 7-8 (filed June 19, 2017) (T-Mobile Petition).

technologies that can deliver higher speeds, more capacity, and lower latency for consumers, as the Commission correctly recognized in the Spectrum Frontiers proceeding.¹⁴ As NCTA has argued elsewhere, unlicensed devices and other technologies are poised to form an important part of the 5G ecosystem.¹⁵ In fact, Nokia, Intel, Cisco, and 5G Americas have all recognized that 5G networking will rely on integrating a variety of different radio access technologies.¹⁶ The Commission need not, therefore, remake the 3.5 GHz band in the image of 700 MHz or 600 MHz, but can rest assured that flexible and varied 5G services will develop under the existing framework, subject only to modest changes.

In short, investment in 3.5 GHz by both traditional and non-traditional participants in the wireless space, including cable operators, is well underway. In response to the CTIA and T-Mobile petitions, the Commission should make only those rule changes that receive broad

¹⁴ See *Use of Spectrum Bands Above 24 GHz For Mobile Radio Services et al.*, Notice of Proposed Rulemaking, 30 FCC Rcd 11878, ¶ 1 n.1 (2015) (declining to define 5G narrowly and considering spectrum designations for both licensed and unlicensed services to support next-generation wireless technologies).

¹⁵ Comments of NCTA – The Internet & Television Association, GN Docket No. 14-177, et al., at 5-6 (filed Sept. 30, 2016).

¹⁶ *5G to Embrace Unlicensed Bands and Wi-Fi*, Mobile World Live (Feb. 24, 2016), <http://www.mobileworldlive.com/mwc16-articles/5g-to-embrace-unlicensed-bands-and-wi-fi/>; see also Nokia, *FutureWorks Looking Ahead to 5G: Building a Virtual Zero Latency Gigabit Experience*, White Paper, at 3 (2014), http://www.5gamericas.org/files/3614/3898/6583/Nokia_White_Paper_-_Looking_ahead_to_5G.pdf (“[5G] will be a combination of existing [Radio Access Technologies (RATs)] in both licensed and unlicensed bands, plus one or more novel RATs optimized for specific deployments, scenarios and use cases.”); 4G Americas, *5G Spectrum Recommendations*, White Paper, at 11 (Aug. 2015), http://www.4gamericas.org/files/6514/3930/9262/4G_Americas_5G_Spectrum_Recommendations_White_Paper.pdf; see generally CISCO, Cisco 5G Vision Series: Licensed, Unlicensed, and Access-Independent Networks (May 23, 2016), <http://www.techinvestornews.com/Mobile/Latest-Mobile-News/cisco-5g-vision-series-licensed-unlicensed-and-access-independent-networks>.

support among this diversity of stakeholders, and should preserve the key features of the 3.5 GHz innovation band that drew interest from such stakeholders in the first instance.

III. NCTA SUPPORTS MODEST CHANGES TO PAL GEOGRAPHIC AREA AND LICENSE TERM TO PROMOTE INVESTMENT AND SIMPLIFY NETWORK DEPLOYMENT AND OPERATION.

CTIA and T-Mobile have proposed that the Commission adopt changes to the PAL geographic area size and license term that would transform the 3.5 GHz band from a place where innovative business models can thrive to a traditional licensed cellular band. Although NCTA believes such drastic changes to the rules are not necessary, NCTA agrees with the carriers that modest adjustments to the Commission's existing rules could promote investment and ease administrative burdens. Specifically, NCTA supports the adoption of county—rather than census tract or PEA—sized license areas. However, the Commission should approach with caution the carriers' suggestion that it adopt a longer license term and expectation of renewal without accompanying performance requirements. Such an approach would enable spectrum squatting and reduce interest in the band from non-traditional participants.

A. County-Sized License Areas Strike the Right Balance Between Preserving Low Barriers to Entry and Minimizing Administrative Burdens.

Smaller license areas than traditional licensed bands form one of the key features of 3.5 GHz. The Commission adopted census-tract-sized license areas on the theory that using such small license sizes, "PAL applicants could target specific geographic areas in which they need additional coverage and avoid applying for areas that they do not intend to serve,"¹⁷ reducing the

¹⁷ 2015 Order ¶ 94.

capital requirements traditionally associated with acquiring mobile spectrum licenses. The Commission also found that census-tract-size licenses were a better fit for the propagation characteristics of the band and its likely use for small-cell deployments.¹⁸

CTIA and T-Mobile argue that auctioning and managing 74,000 census-tract-sized license areas leading to a total of 518,000 PALs would impose a significant burden on the Commission, on the SAS databases, and on those licensees that wish to aggregate license areas for larger deployments.¹⁹ They suggest that the Commission instead adopt 416 PEA-sized license areas, consistent with several other licensed bands.

Instead, NCTA suggests that the Commission adopt county-sized license areas, which would balance the Commission's desire for small, granular license areas to encourage innovation, with the investment certainty that larger license areas would bring. It would significantly reduce the administrative burden and risk for the Commission, the SAS databases, and licensees, by reducing the total license areas from 74,000 to approximately 3,150. This reduction would facilitate a timely and easily administered auction, simplify border coordination issues for licensees who wish to aggregate PALs for a larger footprint, and streamline SAS operations. At the same time, county-sized license areas are a better fit for more localized deployments than large PEAs, and would continue to foster "opportunities for participation with much lower capital investment requirements" than traditional licensed bands.²⁰

¹⁸ *Id.*

¹⁹ CTIA Petition at 9-10; T-Mobile Petition at 16.

²⁰ *See 2015 Order* ¶ 100.

NCTA agrees with the many commenters who have previously expressed on the record that the large license areas typical in licensed mobile bands would be a poor fit for 3.5 GHz.²¹ Such large license sizes would significantly increase barriers to entry and would therefore depress the development of the innovative business models the Commission intended to encourage. As the Commission noted, traditional license sizes are “inconsistent with our desire to promote innovative, low power uses in this band.”²² Moreover, PEA-sized licenses, under large operator control, would disadvantage aspiring rural broadband deployments, with buildout efforts concentrated in densely populated areas at the expense of rural broadband. Even the suggested likelihood of secondary-market license partitioning would come only at increased expense to aspiring rural operators and accompanying impacts on already challenged rural broadband economics. The Commission should therefore reject CTIA’s and T-Mobile’s requests to adopt PEA-sized licenses and should instead license the 3.5 GHz band by county.

B. A Ten-Year License Term Without Performance Requirements Is Not In the Public Interest.

Similar to their arguments that the Commission should enlarge the geographic area size for 3.5 GHz licenses, the carriers also reiterate their request that the Commission extend the PAL term to ten years with an expectation of renewal, as is common in traditional licensed bands.²³

²¹ See, e.g., Reply Comments of Google, Inc. on the Proposed Revised Framework, GN Docket No. 12-354, at 12 (Dec. 20, 2013); Reply Comments of Open Technology Institute at the New America Foundation and Public Knowledge, GN Docket No. 12-354, at 18 (Dec. 20, 2013).

²² 2015 Order ¶ 100.

²³ CTIA Petition at 6; T-Mobile Petition at 13.

NCTA agrees that the current three-year license terms, even with a six-year initial term,²⁴ are insufficient to obtain adequate return on investment. However, the Commission can lengthen the term substantially without undoing another key feature of the existing rules designed to reduce barriers to entry and foster the development of innovative services.

The license area size for 3.5 GHz is substantially smaller than the PEAs, Economic Areas, and Cellular Market Areas used in other bands. As the Commission has correctly pointed out, network operators likely do not require the same amount of time to build out their 3.5 GHz networks and obtain return on investment as they would in other licensed bands with larger license areas.²⁵ Even if the Commission acts on NCTA's suggestion to adopt county-sized license areas, these will remain significantly smaller than in other licensed bands. CTIA and T-Mobile have not adequately explained why they would require the same ten-year term to build out a substantially smaller area. And although T-Mobile suggests that deployments take "several years,"²⁶ this is not sufficiently specific evidence for the Commission to reverse course and determine that a ten-year term is required.

The Commission should approach with caution the carriers' suggestion that it adopt an expectation of renewal with no accompanying performance requirements.²⁷ This approach

²⁴ See 47 C.F.R. §§ 96.25(b)(3), 96.27(b).

²⁵ 2015 Order ¶ 110; *Amendment of the Commission's Rules with Regard to Commercial Operations in the 3550-3650 MHz Band*, Order on Reconsideration and Second Report and Order, 31 FCC Rcd 5011, ¶ 45 (2016) (2016 Order).

²⁶ T-Mobile Petition at 11.

²⁷ *Id.* at 12-13; CTIA Petition at 6, 8.

would, in effect, create a perpetual license with no deterrence to spectrum squatting. It would also do away with the flexibility inherent in “periodic, market-based reassignment of . . . rights in response to changes in local conditions and operator needs,” potentially reducing interest in the band by non-traditional players proposing innovative business models.²⁸ The Commission specifically found that build-out requirements were unnecessary because it adopted short license terms with no expectation of renewal.²⁹ It would be inappropriate for the Commission to adopt a ten-year term with an expectation of renewal—in effect creating a perpetual license—without requiring some demonstration that the licensee is providing service to consumers.

IV. THE COMMISSION SHOULD PRESERVE ACCESS TO GAA SPECTRUM AND SHOULD NOT AUCTION THE ENTIRE 3550-3700 MHZ BAND.

Sufficient access to GAA spectrum that can be used alone or in coordination with PALs is critical to the 3.5 GHz band ecosystem. The Commission should deny T-Mobile’s request to auction the entire 3550-3700 MHz band,³⁰ which would upset the careful balance the Commission struck between PAL and GAA use and depress investment in GAA services.

In its *2015 Order*, the Commission correctly found that “ensuring that a stable and significant quantity of spectrum is available for both Priority Access Licensees and GAA will foster innovation, encourage efficient use of the band, and create an environment conducive to a wide array of potential users and uses.”³¹ The existing 3.5 GHz rules implement this vision by

²⁸ See *2016 Order* ¶ 44.

²⁹ See *2015 Order* ¶ 113.

³⁰ T-Mobile Petition at 9-11.

³¹ *2015 Order* ¶ 63.

making available for auction up to seven PAL licenses (70 MHz of PAL spectrum) in a particular license area, guaranteeing GAA access to only 30 MHz of the 3550-3650 MHz band in any market.³² However, the Commission evened out this discrepancy by ensuring that GAA would have access to the 50 MHz of spectrum from 3650-3700 MHz,³³ providing a minimum of 80 MHz of spectrum for GAA use in every market.³⁴

The Commission's 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. NCTA agrees with Microsoft that "[a] thriving GAA ecosystem -- which includes device makers, chip makers, component suppliers, and carriers -- requires a critical mass of GAA spectrum available in every [market] nationwide."³⁵ And as the Public Interest Spectrum Coalition noted, "[e]nsuring a substantial amount of open and opportunistic [GAA] spectrum . . . is also likely a prerequisite to the benefits of a mass market for interoperable and dynamic frequency devices that can operate on either a PA[L] or a GAA basis."³⁶ Eliminating any guarantee that GAA spectrum will be available in every market by auctioning the entire

³² See 47 C.F.R. §§ 96.11, 96.13.

³³ *Id.* § 96.13 ("The 3650-3700 MHz band shall be reserved for Grandfathered Wireless Broadband Licensees and GAA Users.").

³⁴ 2015 Order ¶ 67.

³⁵ Comments of Microsoft Corporation, GN Docket No. 12-354, at 2 (filed July 14, 2014); *see also* Comments of Google, Inc. on the Proposed Licensing Framework, GN Docket No. 12-354, at 15 (filed Dec. 5, 2013) ("Google agrees that the rules should account for the possibility that there may be locations where demand for Priority Access use becomes so high as to preclude GAA operations. The Commission therefore should reserve some spectrum in this band for GAA use.").

³⁶ Reply Comments of Open Technology Institute at the New America Foundation, Institute for Local Self-Reliance, Public Knowledge, and Common Cause, GN Docket No. 12-354, at 16 (filed Aug. 15, 2014).

3550-3700 MHz band would severely undermine a network operator's flexibility in network design and deployment and could depress interest in developing 3.5 GHz equipment and innovative GAA services.

Moreover, with respect specifically to the 3650-3700 MHz band, the Commission correctly concluded that GAA was better positioned than PAL users to share these frequencies with grandfathered wireless broadband licensees both during and after the transition period.

According to the Commission:

GAA operation closely aligns with the current licensing regime in the band where licenses are awarded on a non-exclusive basis and licensees must share spectrum and coordinate operations. . . . We believe that limiting the 3650–3700 MHz band to GAA use post-transition, rather than adopting our original proposal to allow both PALs and GAA use, will minimize disruption to incumbent operators.³⁷

NCTA agrees that opportunistic users have a proven track record of successfully protecting incumbent operations and that making available the 3650-3700 MHz band for GAA rather than PAL use would smooth the transition and promote harmony in the shared band.

V. NCTA SUPPORTS MODEST CHANGES TO THE CBSD TECHNICAL RULES.

CTIA and T-Mobile in their petitions, and Qualcomm in a separate ex parte letter, suggest several changes to the technical rules for CBSD operation. NCTA supports modest technical rule changes, provided that such changes apply to both PAL and GAA operations and would not alter the protection criteria established for incumbents.

Informed by an extensive record, the Commission specifically determined that the 3.5 GHz band technical rules should apply to both PAL and GAA users. As the Commission noted in its *2015 Order*, adopting the same technical rules for both tiers of users will “allow

³⁷ *2015 Order* ¶ 410.

Citizens Broadband Radio Service users to effectively access both tiers using the same equipment.”³⁸ In its comments, NCTA described how harmonized technical rules for PAL and GAA would facilitate flexible network deployments:

[A] network operator might initially obtain a PAL for a particular area but then subsequently determine that GAA operations are suitable for deployments in that location. Conversely, an operator using GAA spectrum may seek to convert a deployment to a PAL area in order to take advantage of Quality of Service guarantees or other PAL features. And operators may elect to deploy a heterogeneous mix of PAL and GAA small cells depending on spectrum availability and operating conditions.³⁹

NCTA reads the T-Mobile, CTIA, and Qualcomm technical proposals as applicable to both GAA and PAL licensees, but emphasizes that its support for certain of these proposals is contingent upon retaining harmonized technical rules for PAL and GAA operations.

Specifically, NCTA supports Qualcomm’s proposed changes to the CBSD emissions limits to support PAL and GAA use of wider bandwidth channels.⁴⁰ The proposed emissions limits would facilitate the use of 20 MHz-wide and 40 MHz-wide channels without a penalty in the form of reduced power, while retaining the protection criteria that the Commission established for adjacent-band incumbents. In rejecting previous proposals to revisit the CBSD emissions limits, the Commission concluded, without support, that “ten megahertz channels provide a flexible, scalable, and practically deployable bandwidth for high data rate

³⁸ *Id.* ¶ 174; *see also* 47 C.F.R. Part 96, Subpart E.

³⁹ NCTA Comments at 11-12.

⁴⁰ Letter from Dean R. Brenner, Senior VP - Spectrum Strategy & Technology Policy, and John W. Kuzin, VP and Regulatory Counsel, Qualcomm Inc., to Marlene H. Dortch, Secretary, FCC, GN Docket No. 12-354 (filed June 19, 2017) (Qualcomm Ex Parte).

technologies,” and therefore “reducing OOB limits solely to accommodate wider bandwidths” was not necessary.⁴¹ However, today’s wireless services—which carry a predominant and growing share of video traffic⁴² and support ever-growing numbers of users—require wide-bandwidth channels to deliver optimal user experience.⁴³ The Commission should expect that 3.5 GHz band users will wish to bond channels and should adopt Qualcomm’s proposal to ensure that users will be able to do so without a power reduction that “would significantly diminish signal coverage, the quality of service, and the usefulness of the band for mobile operations.”⁴⁴

Notably, because Qualcomm’s proposed changes preserve the -40 dBm/MHz limit adopted to protect the operations of incumbents in adjacent bands,⁴⁵ Qualcomm anticipates that its proposal “will not have any increased impact on users in the adjacent bands.”⁴⁶ NCTA agrees that this limit should remain in place to protect adjacent C-Band operations.

⁴¹ 2016 Order ¶ 93.

⁴² Cisco states that video comprised 64% of U.S. mobile data traffic at the end of 2016 and predicts that video will constitute 80% of U.S. mobile data traffic in 2021. Cisco, *VNI Forecast Highlights Tool*, http://www.cisco.com/c/m/en_us/solutions/service-provider/vni-forecast-highlights.html# (from the North America drop-down menu, select “United States,” click the radio button for “Mobile Highlights,” and expand the heading for “Mobile Video Traffic”).

⁴³ See, e.g., National Instruments, *Introduction to 802.11ax High-Efficiency Wireless*, <http://www.ni.com/white-paper/53150/en/> (Apr. 20, 2017) (describing the next-generation Wi-Fi standard which supports 160-MHz channels); *Use of Spectrum Bands Above 24 GHz for Mobile Radio Services, et al.*, Report and Order and Further Notice of Proposed Rulemaking, 31 FCC Rcd 8014, 8053 ¶ 95 (2016) (describing the need for 200 MHz-wide channels to support high-frequency 5G services).

⁴⁴ Qualcomm Ex Parte at 1.

⁴⁵ See 47 C.F.R. § 96.41(e)(2).

⁴⁶ Qualcomm Ex Parte at 2.

In contrast, T-Mobile proposes significant changes to the emissions limits, including either eliminating the -40 dBm/MHz limit in section 96.41(e)(2) altogether or increasing the transition gap to 40 MHz.⁴⁷ Such changes would disrupt a balance the Commission carefully struck between new entrants and the protection of incumbent adjacent channel operations and are not necessary to achieve the desired benefits for channel bonding.

NCTA also supports protecting CBSD registration information from public disclosure,⁴⁸ provided that the SAS databases can access and exchange sufficiently robust registration information to enable three-tier sharing, and both GAA and PAL users can coordinate their spectrum use with a SAS database. So long as prospective users of the band can obtain sufficient information to plan and execute their network deployments, there should be no need for public disclosure of detailed registration information. Without a compelling need for disclosure to the public of this sensitive registration information—which could have adverse consequences for competition and network security—the Commission should err on the side of protection.

VI. CONCLUSION

The Commission should act only on those proposals by CTIA and T-Mobile that will promote investment and eliminate unnecessary administrative or technical impediments while preserving core features of the innovative 3.5 GHz band structure that the industry has already embraced. The Commission should move forward expeditiously to adopt modest rule changes such as larger county-sized licenses. It should also revise the emissions limits for PAL and GAA equipment to facilitate channel bonding and should protect CBSD registration information.

⁴⁷ T-Mobile Petition at 21-22.

⁴⁸ CTIA Petition at 11; T-Mobile Petition at 19.

However, the Commission should reject T-Mobile's proposal to auction the entire 3550-3700 MHz band to preserve the balance of PAL and GAA spectrum available for flexible network deployments.

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July 24, 2017

CERTIFICATE OF SERVICE

I, Gretchen M. Lohmann, hereby certify that on this 24th day of July, 2017, I served one copy of the foregoing Comments on Petitions for Rulemaking by U.S. mail on the following parties:

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/s/ Gretchen M. Lohmann