

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 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)	

COMMENTS OF UNITED STATES CELLULAR CORPORATION

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United States Cellular Corporation (“USCC”) submits these comments in support of the Petitions for Rulemaking filed by CTIA and T-Mobile USA, Inc.,¹ and urges the Commission to release a Third Further Notice of Proposed Rulemaking in this proceeding seeking comment on the proposals set forth by CTIA and T-Mobile.

I. INTRODUCTION & SUMMARY

Wireless service providers will require a mix of low-, mid- and high-band spectrum in order to provide consumers with a seamless 5G experience, with the mid-band spectrum providing unique coverage and capacity benefits. Given that “the 3.5 GHz band is the only mid-band spectrum available for 5G in the U.S. spectrum pipeline,”² this spectrum will be a crucial component of wireless providers upcoming deployments of 5G networks. The Commission, therefore, must ensure that the licensing and technical rules for the 3.5 GHz band facilitate investment in the Citizens Broadband Radio (“CBR”) Service to the greatest extent possible. USCC generally applauds the Commission’s efforts thus far with respect to making the 3.5 GHz band available for commercial 5G deployments, but agrees with CTIA, T-Mobile, and others that

¹ See Petition for Rulemaking, CTIA (June 16, 2017) (“CTIA Petition”); Petition for Rulemaking, T-Mobile USA, Inc. (June 19, 2017) (“T-Mobile Petition”). All filings cited herein were filed in the above-listed docket.

² T-Mobile Petition at 5; see CTIA Petition at 3.

the complexity and uncertainty inherent in the current CBR Service licensing and technical rules will stymie investment in the 3.5 GHz band, and thus, undermine the CBR Service's potential to help meet consumers' data demands and to facilitate the nation's transition to 5G.

In particular, as detailed herein, authorizing Priority Access Licenses ("PALs") on the basis of census tracts will result in an unmanageable licensing scheme that will depress interest, and thus investment, in the 3.5 GHz band. USCC therefore urges the Commission to instead authorize PALs on the basis of Partial Economic Areas ("PEAs"), which are large enough to eliminate much of the complexity that would arise from census tract-level licensing, but also small enough to continue to permit targeted service deployments. In addition, the unreasonably short three-year terms for PALs and the inability to renew PALs for subsequent terms will greatly diminish the attractiveness of PALs because this licensing framework would give rise to an unreasonable risk that licensees' investments in the 3.5 GHz will become stranded. USCC, therefore, urges the Commission to increase the PAL term to ten years, and to establish a procedure for awarding license renewal expectancies.

Further, USCC urges the Commission to repeal the requirement that it only make PALs available in license areas for which mutually-exclusive applications have been filed, and that it limit the number of PALs made available based on the level of such mutual exclusivity. Given that a large number of different service providers require the quality of service guarantees that will be available in the 3.5 GHz band only via a PAL, investment in the 3.5 GHz band may be minimal or non-existent in those markets without PALs, or with an insufficient number of PALs, as a result of the mutual exclusivity requirement. Finally, USCC urges the Commission to increase the power limits for both Citizen Broadcast Radio Devices ("CBSDs") and End User Devices operating in the 3.5 GHz band because the limited coverage that will result from the

current power limits will drive up network costs, and thereby risk decreased investment in the 3.5 GHz band.

II. PALs SHOULD BE AUTHORIZED ON THE BASIS OF PEAs, RATHER THAN CENSUS TRACTS

USCC joins CTIA and T-Mobile in urging the Commission to authorize PALs on the basis of PEAs, rather than at the census tract level.³ As T-Mobile explained, for a variety of reasons, “census tract licensing will result in an unmanageable licensing scheme, depressing interest in the 3.5 GHz band.”⁴ For instance, because census tract-level licensing would involve 74,000 license areas and up to 518,000 PALs, it “will be difficult for the SAS to administer and manage,”⁵ as well as “unnecessarily challenging ... for licensees themselves to manage,”⁶ including in the auction context given that potential PAL licensees “will be required to evaluate each census tract – each of which vary in size – in order to determine which licenses best suit [their] business needs.”⁷ Census tract-level licensing also will create “unnecessary interference risks given the extensive border areas between different licensees operating in adjacent census tracts.”⁸

PEA-based licensing, in contrast, would involve a far more manageable 416 license areas. Due to their larger size, PEAs would “result in fewer administrative burdens for the Commission, SAS administrators, and licensees, alike,”⁹ would make PAL auctions far less

³ See CTIA Petition at 10; T-Mobile Petition at 16.

⁴ T-Mobile Petition at 16.

⁵ *Id.*

⁶ CTIA Petition at 9.

⁷ T-Mobile Petition at 16.

⁸ CTIA Petition at 9; see Comments of Qualcomm Inc., p. ii (July 14, 2014) (“[T]he large number of licenses ... creates multiple orders of magnitude greater interference management needs at the boundaries between licensed areas.”); Comments of Mobile Future, p.6 (July 14, 2014); Reply Comments of AT&T, p. 7 (Dec. 20, 2013).

⁹ T-Mobile Petition at 17.

complicated,¹⁰ and would “reduce[] border areas and accompanying risks for interference.”¹¹

PEAs also would be consistent with the licensing approach the Commission adopted for the millimeter wave (“mmW”) bands, which likewise will be used for the deployment of 5G networks.

In addition, the Commission has found that PEAs “can be easily aggregated into larger areas.”¹² PEAs, therefore, would better fulfill one of the Commission’s goals in this proceeding – namely, “allowing easy aggregation to accommodate a larger network footprint.”¹³ At the same time, PEAs are small enough to “encourage entry by providers that contemplate offering wireless broadband service on a localized basis...”¹⁴ Accordingly, despite their larger size, PEAs nevertheless would sufficiently advance other Commission goals in this proceeding, including “allow[ing] flexible and targeted network deployments” and “promoting intensive and efficient use of the spectrum.”¹⁵ Moreover, because of the light-touch leasing rules adopted for the 3.5 GHz band, PEAs would “continue to enable opportunities for those providers interested in micro-targeting service in smaller areas.”¹⁶ If the Commission authorizes PALs on the basis of PEAs, USCC also encourages it to permit the partitioning and disaggregation of PALs. As the Commission has explained, permitting partitioning and disaggregation “can facilitate the

¹⁰ See *Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions*, Report and Order, 29 FCC Rcd 6567, 6597 (2014) (“*Incentive Auction Order*”) (finding that PEAs would not “unduly complicating the auction”).

¹¹ CTIA Petition at 10; see *Use of Spectrum Bands Above 24 GHz For Mobile Radio Services*, Report and Order and Further Notice of Proposed Rulemaking, 31 FCC Rcd 8014, 8046 (2016) (“*mmW Bands Order*”) (noting that the use of PEAs will “simplify[] frequency coordination”).

¹² *Incentive Auction Order*, 29 FCC Rcd at 6597.

¹³ *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, 3991 (2015) (“*3.5 GHz Order*”).

¹⁴ *Incentive Auction Order*, 29 FCC Rcd at 6597.

¹⁵ *3.5 GHz Order*, 30 FCC Rcd at 3991.

¹⁶ CTIA Petition at 10.

efficient use of spectrum, and expedite provision of services in areas that might not otherwise receive service in the near term.”¹⁷

Finally, USCC questions the Commission’s justifications for adopting census tract-level licensing for the 3.5 GHz band. For instance, although the Commission described the use of census tracts as “the appropriate middle ground among the competing proposals” in this proceeding,¹⁸ USCC agrees with T-Mobile that, rather than represent a “middle ground” compromise, authorizing PALs on the basis of census tracts “represents a bias in favor of how spectrum is used on an unlicensed basis.”¹⁹ As T-Mobile has explained, while census tract-level licensing “may be appropriate for spectrum used in a limited area on a ‘spot’ basis ... it is fundamentally inconsistent with how carriers – or any licensed users – deploy spectrum.”²⁰ Most carriers will instead seek to acquire PALs “throughout a market as part of a strategy to provide the type of coverage or capacity best satisfied by small cells,” and are unlikely to try to pursue this strategy on a piecemeal, census tract-level basis.²¹ USCC also agrees with T-Mobile that, despite the general interest in deploying small cells in the 3.5 GHz band, the adoption of such small license areas wrongly assumes that this band will be used only for very small cell base operations, when in reality, it “may be used for different applications, including for carriers’ backhaul needs, which would require point-to-point configurations and a larger protection area to cover both ends of a link.”²²

¹⁷ *Incentive Auction Order*, 29 FCC Rcd at 6891.

¹⁸ *3.5 GHz Order*, 30 FCC Rcd at 3993.

¹⁹ T-Mobile Comments (July 2014) at 9.

²⁰ *Id.*

²¹ *Id.*; see CTIA Petition at 8 (“[P]roviders may well choose to incorporate 3.5 GHz PAL spectrum into their ubiquitous outdoor wide-area networks.”).

²² Reply Comments of T-Mobile USA, Inc., p. 8 (Dec. 20, 2013); see *3.5 GHz Order*, 30 FCC Rcd at 3992 (“Census tract-level licensing [] aligns well with small cell deployment.”).

III. THE COMMISSION SHOULD INCREASE THE PAL TERM TO TEN YEARS AND ADOPT A RENEWAL EXPECTANCY

USCC supports the requests by CTIA and T-Mobile that the Commission increase the PAL term to ten years and adopt a renewal expectancy.²³ A maximum PAL term of six years, with no renewal rights, is an inadequate amount of time for a service provider to build out a network and receive a sufficient return on its investment in the 3.5 GHz band, especially given the significant time and complexity involved in deploying large numbers of small cells.²⁴ Consequently, as CTIA explains, the current licensing framework creates an unreasonable risk that service providers will expend money and resources to acquire PALs and deploy networks and “then face stranded investment in just three or six years.”²⁵ The current framework, therefore, will “diminish the attractiveness of PALs, reduce investment and innovation in the band, and limit the potential of the three-tiered CBRS spectrum access regime to succeed.”²⁶

In contrast, a ten-year license term with a renewal expectancy “would facilitate robust markets, substantial investment, and the development of new technologies in the band...”²⁷ A ten-year license term with a renewal expectancy also would be consistent with the Commission’s proven approach in many other bands, including the mmW bands, which also will be used for the deployment of 5G networks. Notably, in adopting the ten-year license term for the mmW bands,

²³ See CTIA Petition at 8; T-Mobile Petition at 13. USCC also agrees with T-Mobile that, “as a consequence of issuing licenses for a longer term with a renewal expectancy, it is appropriate for the Commission to impose performance requirements on PAL holders.” T-Mobile Petition at n. 48. Alternatively, WISPA recently proposed that “PALs could be renewed upon payment of a fee based on the auction price paid by the PAL holder...” Letter from Stephen E. Coran, Counsel for the Wireless Internet Service Providers Association, to Marlene H. Dortch, Secretary, FCC, p. 2 (Apr. 7, 2017).

²⁴ See *Comment Sought on Streamlining Deployment of Small Cell Infrastructure by Improving Wireless Facilities Siting Policies*, Public Notice, 31 FCC Rcd 13360, 13366 (2016) (noting that applicants for small cell sites “are frequently required to contend with a long and costly process”).

²⁵ CTIA Petition at 6.

²⁶ *Id.*; see T-Mobile Petition at 11.

²⁷ T-Mobile Petition at 13.

the Commission explained that such action “will give licensees sufficient certainty to invest in their systems, particularly as the new technology is still nascent and will require time to fully develop.”²⁸ Likewise, in awarding a renewal expectancy for the mmW bands, the Commission noted that such action “will provide incentives for licensees to continue to provide service.”²⁹

Finally, USCC notes that, in previously declining to adopt a renewal expectancy, the Commission stated that the investment made by a licensee that fails to re-obtain a PAL for a subsequent term would not be stranded because the provider could “use the same equipment in the same area as a GAA licensee.”³⁰ This reasoning, however, is based on the false premise that a former licensee’s operations could be adequately accommodated via access to the 3.5 GHz band on a GAA basis. In reality, the availability of GAA spectrum fails to provide the interference protection rights that are “necessary to meet stringent quality of service requirements for commercial services and which encourage innovation and capital investment in the spectrum.”³¹ Moreover, in areas where demand for spectrum is high, there would be no guarantee that a former licensee would even have sufficient access to GAA spectrum.³²

IV. PALs SHOULD BE MADE AVAILABLE IN EVERY LICENSE AREA, REGARDLESS OF THE EXISTENCE OF MUTUAL EXCLUSIVITY

USCC supports T-Mobile’s request that the Commission amend its rules to permit the assignment of PALs in every license area, including those license areas for which there is only one PAL applicant.³³ USCC notes that Commissioner O’Rielly and a majority of commenters in

²⁸ *mmW Bands Order*, 31 FCC Rcd at 8078.

²⁹ *Id.*

³⁰ *3.5 GHz Order*, 30 FCC Rcd at 3996.

³¹ Comments of Cantor Telecom Services, L.P., p. 9 (July 15, 2015); *see* CTIA Petition at 6-7.

³² *See* CTIA Petition at 7; Comments of Alcatel-Lucent, p. 4 (Dec. 5, 2013) (“[T]here is no guarantee of availability of GAA spectrum featuring the amount of bandwidth and quality of service required.”).

³³ *See* T-Mobile Petition at 14.

this proceeding have already expressed their support for this proposal.³⁴ USCC also urges the Commission to repeal the requirement in Section 96.29(c) of its rules that one less PAL will be made available in a license area than the total number of PALs in that license area for which applicants have applied. Instead, given the importance of PALs to many service providers, the number of PALs made available in a given license area, whether in the initial or a subsequent auction of PALs, should be equal to the number of PALs for which applicants have applied, up to a maximum of seven PALs. Such action also will facilitate the success of the three-tiered spectrum access framework because, absent the quality of service guarantees of a PAL, investment in the 3.5 GHz band will suffer.³⁵

USCC believes that the best approach for implementing this proposal would be to offer seven PALs in every license area via an ascending clock auction format, regardless of the number of PAL applicants for any license area. Under this approach, the PALs in each license area would be subject to a minimum opening bid, as well as the existing spectrum aggregation limit of four PALs. If the aggregate demand in a license area does not exceed seven PALs, the applicant(s) would receive the number of PALs for which they applied, subject to the payment of the minimum opening bid for those PALs. To the extent that aggregate demand is less than seven PALs for a given license area, the Commission would assign the number of PALs for

³⁴ See *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, 5131 (2016) (Statement of Commissioner Michael O'Rielly Approving in Part, Dissenting in Part) ("O'Rielly Recon Statement") ("PALs should be available in any census tract – even if there is only one entity interested in priority access."); see, e.g., Reply to Opposition to Petition for Reconsideration of CTIA – The Wireless Association, p. 9 (Oct. 29, 2015) ("CTIA Reply to Opposition"); Petition for Reconsideration of Motorola Solutions Inc., p. 5 (July 23, 2015) ("Motorola Solutions Recon Petition"); Reply of Federated Wireless, Inc., to Oppositions to Petitions for Reconsideration, p. 4 (Oct. 29, 2015) ("Federated Wireless Reply to Oppositions"); Reply to Oppositions of the Utilities Telecommunications Council, p. 1 (Oct. 29, 2015) ("UTC Reply to Oppositions") (Oct. 2015) at 1; Opposition of the Wireless Internet Service Providers Association, p. 13 (Oct. 19, 2015) ("WISPA Opposition"); Reply Comments of Cantor Telecom Services, L.P., p. 2 (Aug. 14, 2015) ("Cantor Reply Comments").

³⁵ See Cantor Reply Comments at 2; Comments of the Consumer Electronics Association, p. 3 (Dec. 5, 2013).

which there was demand, again subject to the payment of the opening minimum bid for those PALs, and the remaining spectrum in that license area would be made available on a GAA basis.

USCC notes that, if the Commission makes PALs more attractive by adopting PEA-based license areas and a ten-year license period with a renewal expectancy, it will be far less likely that the aggregate demand in any license area will be less than seven PALs. Nevertheless, the Commission should amend its rules as proposed herein to ensure that those requiring exclusive spectrum rights have an opportunity to acquire PALs even if the demand for PALs is low in the license area of interest. Moreover, as discussed below, even with significant demand for PALs in every license area, the current rules would risk gradually phasing out PALs over time.

Revising the current competitive bidding procedures to ensure the availability of PALs in every license area is necessary given the significant importance of exclusive-use spectrum to many wireless service providers and users. For instance, a variety of potential CBR Service operators require the quality of service guarantees that will only be available in the 3.5 GHz band via a PAL, including broadband service providers,³⁶ hospitals,³⁷ utilities and other critical infrastructure industries,³⁸ and providers of video surveillance, telemetry, and monitoring services.³⁹ As Jon Peha astutely observed earlier in this proceeding, “[i]f there is benefit to PALs, then why should any region be denied that benefit just because there is only one bidder?”⁴⁰

Notably, the Commission already agreed with the logic of this reasoning when it adopted the “rural area” exception to the mutual exclusivity requirement. Although a lack of mutual

³⁶ Motorola Solutions Recon Petition at 6.

³⁷ See WISPA Opposition at 13.

³⁸ See UTC Reply to Oppositions at 1.

³⁹ CTIA Reply to Opposition at 9.

⁴⁰ Petition for Reconsideration, Jon M. Peha, p. 2 (July 22, 2015).

exclusivity may be more likely in rural license areas, the Commission adopted this exception to create an opportunity for operators in these areas “to secure assured exclusive access to spectrum,”⁴¹ not because the odds are greater that mutual exclusivity may not arise in such areas. This reasoning applies equally to every provider that requires exclusive-use spectrum, regardless of location. USCC’s proposed approach also would not be based on an inherently arbitrary distinction between a license area that qualifies for the “rural area” exception and a license area with a slightly higher population density.

Although the Communications Act “does not permit the award of initial licenses through competitive bidding in the absence of mutually-exclusive applications,”⁴² as the Commission acknowledged, the Act does *not* prohibit the Commission from granting licenses in the absence of mutual exclusivity.⁴³ In fact, when it first adopted its competitive bidding rules, the Commission noted that, in the absence of mutually-exclusive applications, it generally would process any applications pursuant to its normal procedures.⁴⁴ With respect to PALs, however, the Commission decided to require mutual exclusivity, finding that the grant of PALs in the absence of mutual exclusivity “would not result in as efficient an assignment of the spectrum as licensing the spectrum for shared GAA use” because, according to the Commission, this approach will ensure that the spectrum is put to use by preventing spectrum warehousing.⁴⁵ However, as Commissioner O’Rielly subsequently explained, “[i]ssuing PALs to one entity will

⁴¹ *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, 5024 (2016) (“3.5 GHz Recon Order”).

⁴² *3.5 GHz Order*, 30 FCC Rcd at 4003.

⁴³ *Id.* (“[W]e could issue PALs for these areas on a non-auctioned basis.”).

⁴⁴ *See Implementation of Section 309(j) of the Communications Act - Competitive Bidding*, Second Report and Order, 9 FCC Rcd 2348, 2376 (1994).

⁴⁵ *3.5 GHz Order*, 30 FCC Rcd at 4003-04.

[] not lead to inefficiencies or spectrum warehousing, as any spectrum that is not ‘in use’ by a Priority Access licensee can be accessed by GAA so it doesn’t necessarily lay fallow.”⁴⁶

The Commission also justified its decision to require mutual exclusivity in part on its belief that, “[i]n the absence of multiple competing applications ... there should be ample GAA spectrum available for interested parties, thereby obviating the need for exclusive rights.”⁴⁷ On this point as well, however, USCC agrees with Commissioner O’Rielly, who stressed that a “lack of multiple auction participants does not mean that the available GAA spectrum is sufficient to meet everyone’s needs and, therefore, PALs are not necessary.”⁴⁸ Moreover, as discussed above, by definition, the GAA tier cannot provide the quality of service guarantees required by many potential CBR Service operators and users.

USCC also notes that the mutual exclusivity requirement conflicts with the Commission’s expressed intent in this proceeding. Specifically, although the Commission’s “underlying principle” for the 3.5 GHz band was that “PALs should be available for applications that require greater certainty as to interference protection,”⁴⁹ the approach ultimately adopted by the Commission “relies purely on market demand to both trigger an auction and allocate PALs according to that demand...”⁵⁰ Moreover, the Commission adopted the mutual exclusivity requirement despite its belief that there is a “substantial likelihood” that mutual exclusivity will not arise in many areas, and thus, that PALs will not be made available in a large number of license areas as a result of this requirement.⁵¹

⁴⁶ O’Rielly Recon Statement, 31 FCC Rcd at 5131.

⁴⁷ *3.5 GHz Recon Order*, 31 FCC Rcd at 5024.

⁴⁸ O’Rielly Recon Statement, 31 FCC Rcd at 5131.

⁴⁹ *3.5 GHz Order*, 30 FCC Rcd at 4002.

⁵⁰ *3.5 GHz Recon Order*, 31 FCC Rcd at 5025.

⁵¹ *See 3.5 GHz Order*, 30 FCC Rcd at 4003.

In addition to highlighting the need for PALs in every license area regardless of mutual exclusivity, T-Mobile, like CTIA previously, explained how the current competitive bidding procedures “risk systematically phasing out PALs with each subsequent auction.”⁵² Specifically, these procedures could prevent existing licensees in a given license area from simply maintaining their current number of PALs because the Commission will offer one less PAL for that license area in the subsequent auction absent new demand for PALs in the license area or increased demand by the existing licensees. As a result, the current procedures will discourage investment in the 3.5 GHz band because, due to the uncertainty “as to whether [licensees] will be able to maintain their operations after the initial license period expires,”⁵³ licensees will fear that their investments will be stranded.

Of course, if the Commission adopts a license renewal expectancy as USCC and others urge, licensees would not face this uncertainty and risk of stranded investment.⁵⁴ However, if the Commission declines to adopt a renewal expectancy despite the various public interest benefits discussed above that would arise from such an expectancy, USCC urges the Commission to at least amend its rules in order to allow existing licensees in this situation to retain the PALs they already hold, perhaps subject to the payment of a minimum opening bid during each subsequent auction.

V. HIGHER POWER LIMITS ARE NEEDED FOR CBR SERVICE DEPLOYMENTS TO BE ECONOMICALLY FEASIBLE

USCC supports T-Mobile’s request that the Commission increase the power limits for CBSDs operating in the 3.5 GHz band to levels sufficiently high for robust deployment of 5G

⁵² T-Mobile Petition at 13; *see* Petition for Reconsideration of CTIA – The Wireless Association, p. 4 (July 23, 2015) (“CTIA Recon Petition”).

⁵³ T-Mobile Petition at 14.

⁵⁴ *See id.* 14, n. 53; CTIA Recon Petition at 4.

technologies. Specifically, T-Mobile asks the Commission: (1) to increase the maximum EIRP for Category A CBSDs from 30 dBm/10 MHz to 36 dBm/10 MHz; (2) to increase the maximum EIRP for non-rural Category B CBSDs from 47 dBm/10 MHz to 49 dBm/10 MHz; and (3) to increase the maximum EIRP for rural Category B CBSDs from 47 dBm/10 MHz to 56 dBm/10 MHz.⁵⁵ Notably, the record in this proceeding already contains significant support for these higher power levels.⁵⁶

In addition, USCC urges the Commission to go slightly further than T-Mobile's proposal by also increasing the power for non-rural Category B CBSDs by 9 dB so that every Category B CBSD, regardless of location, is subject to the same maximum EIRP of 56 dBm/10 MHz. There is no reason to restrict the power of an entire category of CBSDs because some subset of non-rural areas may be too congested to accommodate a higher power level. As the Commission has emphasized, a higher CBSD power limit simply is "an increase in the *maximum allowable* EIRP," not a "guaranteed power level for CBSD deployments."⁵⁷ Moreover, as the Commission previously recognized, such action would "simplify the rules by removing the distinction between rural and non-rural power levels, allowing for uniform development and deployment of Category B CBSDs."⁵⁸ At a minimum, USCC urges the Commission to allow Category B CBSDs using multiple-beam antennas to operate with an aggregate output power transmitted

⁵⁵ T-Mobile Petition at 23.

⁵⁶ See, e.g., CTIA Recon Petition at 7-8; Verizon Petition for Reconsideration, p. 1 (July, 23, 2015) ("Verizon Recon Petition"); Federated Wireless Reply to Oppositions at 2; Petition for Reconsideration by Nokia Networks, p. 9 (July 23, 2015); Petition for Reconsideration, Wireless Innovation Forum, p. 7-8 (July 22, 2015) ("WinnForum Recon Petition").

⁵⁷ 3.5 GHz Recon Order, 31 FCC Rcd at 5033 (emphasis in original).

⁵⁸ *Id.* at 5032.

simultaneously on all beams of up to 8 dB above the power limit for an individual beam, as the Commission allows for fixed multiple-beam transmitters in the 3650-3700 MHz band.⁵⁹

The proposed power increases are necessary because, as T-Mobile explains, “the existing power levels will limit the coverage that cell sites can achieve, thereby driving up network costs and risking decreased investment in the band.”⁶⁰ More specifically, Verizon previously detailed how the limited coverage resulting from the current power limits will drive up network costs because service providers will need to: (1) purchase additional small cells in order to achieve the same level of coverage as higher-power operations; (2) lease more sites in order to accommodate these additional small cells; and (3) spend more on backhaul facilities in order to connect these additional sites to the network.⁶¹ Accordingly, higher power levels are necessary for deployments in the 3.5 GHz band to be economically feasible,⁶² and thus, to ensure sufficient interest and investment in this band.⁶³

USCC submits that, rather than being excessive, T-Mobile’s proposed power increases simply would better reflect real-world deployments, as well as better align with the power requirements for other authorized services. For instance, the current maximum EIRP of 30 dBm/10 MHz for Category A CBSDs is 6 dB lower than the maximum power for Wi-Fi operations in the 2.4 GHz band.⁶⁴ Increasing the maximum EIRP for Category A CBSDs to 36 dBm/10 MHz, therefore, would merely “be consistent with conventional unlicensed power levels

⁵⁹ See *Wireless Operations in the 3650-3700 MHz Band*, Report and Order and Memorandum Opinion and Order, 20 FCC Rcd 6502, 6522 (2005).

⁶⁰ T-Mobile Petition at 23.

⁶¹ See Verizon Recon Petition at 3-4.

⁶² CTIA Reply to Opposition at 5.

⁶³ See Verizon Recon Petition at 4 (“The higher these deployment costs are, the less economic investment in 3.5 GHz systems will be.”); Federated Wireless Reply to Oppositions at 4 (noting that the current EIRP limits will “constrain[] commercial interest and investment in the Citizens Band”).

⁶⁴ See Verizon Reply Comments, p. 7 (Aug. 15, 2014) (“Verizon Reply Comments”).

for indoor use...”⁶⁵ The ability of operators to share the 3.5 GHz band at these power levels, however, would be greater than in the 2.4 GHz band given the inferior propagation characteristics of the 3.5 GHz band.⁶⁶ In addition, even with the proposed power increase, Category B CBSDs “will still operate at power levels no greater than those employed in typical small cell deployments...”⁶⁷ In addition to helping remedy the issues discussed above with respect to the current power limits, by decreasing the power gap between Category B CBSDs and typical existing small cells, the proposed higher power limit would permit quicker, less expensive deployments in the 3.5 GHz band because providers would be able to leverage their existing small cell infrastructure.⁶⁸

The Commission previously declined to increase the power limit for Category A CBSDs because this would require larger Exclusion Zones around incumbent federal operations in the 3550-3650 MHz band. USCC, however, believes that expanded Exclusion Zones are preferable to restricting the power level of every CBSD to a level that would make deployments uneconomical and undermine the potential of the new 3.5 GHz CBR Service.⁶⁹ Alternatively, rather than increase the size of the Exclusion Zones, the SAS could restrict CBSD operations within a specified distance of the existing Exclusion Zones to the current power limits. As noted, CBSDs will not be entitled to always operate at the maximum allowable EIRP, but instead will be required “to operate only at power levels and in locations authorized by the SAS.”⁷⁰

⁶⁵ CTIA Recon Petition at 7; *see* WinnForum Recon Petition at 9.

⁶⁶ *See* Verizon Reply Comments at 7.

⁶⁷ Federated Wireless Reply to Oppositions at 4.

⁶⁸ *See* Verizon Recon Petition at 1.

⁶⁹ *See* Verizon Reply Comments at 7 (“[E]ven if higher power levels do necessitate somewhat larger zones, that would not constitute a reason to prohibit such power levels outside the zones.”).

⁷⁰ *3.5 GHz Recon Order*, 31 FCC Rcd at 5033.

Moreover, given the time that has passed since the Commission first adopted the CBR Service rules, it is now more likely that the Environmental Sensing Capability (“ESC”) will be deployed simultaneously with, or at least shortly after, the SAS. Once the ESC is operational, the Exclusion Zones will be converted to Protection Zones, and thus, any increase in the required size of the Exclusion Zones due to higher power limits would be moot. Although CBSDs will be permitted to operate within the Protection Zones, higher maximum power levels will not lead to greater interference risks because, “based on ESC inputs, the SAS [will] instruct commercial users to vacate a channel when proximity to federal operations (in frequency, location, or time) presents a risk of harmful interference to federal radar systems.”⁷¹

Finally, USCC urges the Commission to also increase the maximum EIRP for End User Devices in the 3.5 GHz band from 23 dBm/10 MHz to 26 dBm/10 MHz, which would be consistent with the power limit for mobile and portable stations operating in the 3650-3700 MHz band.⁷² USCC also notes that 3GPP has proposed to increase the power limit for user equipment operating in band 41 (*i.e.*, the 2.5 GHz band) to 26 dBm/10 MHz.⁷³ In addition to generally increasing the performance of End User Devices, this higher power limit would help to address the uplink/downlink power imbalance in the 3.5 GHz band as a result of the higher CBSD power limits.⁷⁴ At the same time, this action would not increase any interference risks given that the higher power limit would simply be an increase in the maximum allowable EIRP, and End User Devices would remain subject to the requirement that they “may operate only if they can

⁷¹ *3.5 GHz Order*, 30 FCC Rcd at 4070.

⁷² See 47 C.F.R. §90.1321(c).

⁷³ See 3GPP Technical Specification 36.886, v.14 (June 2016) (available at <https://portal.3gpp.org/desktopmodules/Specifications/SpecificationDetails.aspx?specificationId=2943>).

⁷⁴ See Comments of the Wireless Internet Service Providers Association, p. 9 (July 14, 2014) (explaining that the power limit for End User Devices “[e]ffectively reduces the link distance and reliability to the least common denominator of 23 dBm/10 MHz EIRP, such that any benefits intended by [higher-power CBSDs] are negated”).

positively receive and decode an authorization signal transmitted by a CBSD, including the frequencies and power limits for their operation.”⁷⁵

VI. CONCLUSION

For the reasons set forth above, the Commission should grant the petitions filed CTIA and T-Mobile and initiate a further rulemaking in this proceeding with the goal of eliminating, or at least significantly reducing, the complexity and uncertainty inherent in the current CBR Service rules. A failure to address these issues will lead to far less interest in CBR Service operations, and thus, significantly decreased investment in the 3.5 GHz band.

Respectfully submitted,

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⁷⁵ 47 C.F.R. §96.47(a).