

**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 RECONSIDERATION OF  
CTIA – THE WIRELESS ASSOCIATION<sup>®</sup>**

**I. INTRODUCTION AND SUMMARY.**

CTIA – The Wireless Association<sup>®</sup> (“CTIA”) submits this Petition for Reconsideration of the order in the above-captioned proceeding, pursuant to Section 1.429 of the Commission’s rules.<sup>1</sup> CTIA recognizes the potential opportunities arising out of the innovative steps the Commission has taken in establishing the novel Citizens Broadband Radio Service (“CBRS”) three-tiered spectrum access framework in the 3550-3700 MHz band (“3.5 GHz Band”). A handful of policies adopted in the *3.5 GHz Order*, however, threaten to undermine the investment and innovation necessary for the new 3.5 GHz Band to succeed. To that end, CTIA respectfully urges the Commission to reconsider the following policies and put the 3.5 GHz Band on the right track:

- Increase the license terms for Priority Access Licenses (“PALs”) to at least five years and adopt an expectation of license renewal so that the risk of stranded investment does not deter interest in the band;

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<sup>1</sup> *Amendment of the Commission’s Rules with Regard to Commercial Operations in the 3550-3650 Band*, Report and Order, 30 FCC Rcd 3959 (2015) (“*3.5 GHz Order*”).

- Revise the decision to auction one less PAL than the total number of PALs applied for in a given census tract, so as to avoid systematically phasing out PALs with each subsequent auction;
- Increase the out-of-band emission (“OOBE”) limits that otherwise will force licensees operating 20 MHz LTE channels to engage in power backoff thereby diminishing operations in the band, and specify emission power measurements using a root mean square (“RMS”) detector instead of a peak detector; and
- Increase power limits to allow for meaningful indoor and outdoor coverage.

Modifying these policies will put the 3.5 GHz Band, and Priority Access Licensees, in a stronger position to succeed.

## **II. THE FCC SHOULD INCREASE PAL LICENSE TERMS TO AT LEAST FIVE YEARS AND ADOPT AN EXPECTATION OF LICENSE RENEWAL.**

The *3.5 GHz Order* adopted an unprecedented and unreasonably short three-year license term with no renewal mechanism,<sup>2</sup> creating a substantial risk that Priority Access Licensees will face stranded investments. This risk, in turn, will diminish the attractiveness of incorporating PAL spectrum into wide-area networks, thereby reducing investment and innovation in the band and undercutting the promise of the three-tiered spectrum access regime.

The consequences of the *3.5 GHz Order*’s restrictive policies are already playing out. An IEEE 802.11 Working Group recently concluded that the potential market in the 3.5 GHz Band does not justify the time and costs associated with developing a standard to support IEEE 802.11 Wireless Local Area Networks covering those frequencies.<sup>3</sup> A limited three-year PAL term with no renewal expectation will diminish interest in the band even further. The Commission recognizes that “PALs should be available for applications that require greater certainty as to

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<sup>2</sup> *Id.* ¶ 105.

<sup>3</sup> Comments of IEEE 802.11, GN Docket No. 12-354, at 1 (filed July 13, 2015).

interference protection because they would suffer in a congested use environment,”<sup>4</sup> and it should create a licensing framework sufficiently robust to support operations in the 3.5 GHz Band.

The short, three-year PAL license term with no renewal expectation does not provide sufficient time or assurance for operators to be able to realize a return on investment. Even if a licensee obtains two successive three-year licenses during the initial auction,<sup>5</sup> six years is not a sufficient time period in which to both build a network and obtain the financial return an operator would need to justify making such investments. Deploying a network takes several years, including standardizing a new frequency band, developing and certifying equipment, undergoing site acquisition and local zoning and permitting processes, deploying infrastructure, and incorporating the band into consumer devices. These factors create even greater uncertainty in the 3.5 GHz context given the novelty and complexity of rolling out higher frequency small cell deployments. Operators may simply choose not to invest in the band without sufficient certainty that they will be able to obtain a return on investment before a PAL license term expires.

To foster investment in and development of the 3.5 GHz Band, the Commission should extend PAL license terms to five years and grant an ongoing renewal expectancy, provided the licensee has deployed services and registered such use in a Spectrum Access System (“SAS”) database. A longer license term coupled with an ongoing expectation of renewal would provide the certainty operators and investors need to develop and deploy networks in the 3.5 GHz Band to benefit consumers.

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<sup>4</sup> 3.5 GHz Order ¶ 133.

<sup>5</sup> *Id.* ¶ 105 (“[S]olely during the first application window, we will permit an applicant to apply for up to two consecutive three-year terms for any given PAL available during such first application window, for a total of six years.”).

**III. THE FCC SHOULD REVISE THE POLICY OF AUCTIONING ONE LESS PAL THAN APPLIED FOR IN ORDER TO AVOID PHASING OUT PALS WITH EACH SUBSEQUENT AUCTION.**

The *3.5 GHz Order* adopts an auction policy that will make available one less PAL than the total number of PALs applied for in a given census tract, up to a maximum of seven.<sup>6</sup> The Commission should revise this policy as it risks gradually phasing out PALs with each subsequent auction.

For example, consider a census tract with two PAL licensees collectively holding seven licenses after the initial auction. In the next auction, if each licensee simply seeks to maintain its current operations and applies to bid for the same number of licenses that it currently holds (a total of seven), Commission policy dictates that one less PAL will be made available for auction in that census tract. Six PALs will be offered in the auction for that census tract, and at a minimum one of the licensees that has already deployed its network in that census tract will be forced to migrate to General Authorized Access (“GAA”) use or cease operations. Over time, this policy threatens to phase out PALs altogether. In the next subsequent auction, if each licensee again seeks to maintain its current operations and applies for the same number of licenses that it holds, only five PALs would be offered in that auction, and so on.

To ameliorate this problem, the Commission should adopt a five-year license term with an ongoing renewal expectation, as described above, to avoid stranding investment, unnecessarily reducing PAL spectrum access, and undermining the three-tiered spectrum access scheme.

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<sup>6</sup> *Id.* ¶ 133 (“[W]hen there are two or more applicants for PALs in a given census tract for a specific auction, we will make available one less PAL than the total number of PALS in that tract for which all applicants have applied, up to a maximum of seven.”).

**IV. THE FCC SHOULD INCREASE THE OUT-OF-BAND EMISSION LIMITS TO ALLOW LICENSEES TO OPERATE 20 MHz LTE CHANNELS AND SHOULD SPECIFY AN RMS DETECTOR FOR MEASURING EMISSION POWER LIMITS.**

The OOB limits adopted in the *3.5 GHz Order* are overly stringent as applied to the 3.5 GHz Band and likely will force licensees deploying 20 MHz LTE channels to operate at roughly half-power. Specifically, licensees operating 20 MHz LTE channels will have to engage in up to 3 dB A-MPR (“additional maximum power reduction”) under the current rules. Power backoff at this level would cause coverage challenges and significantly diminish the utility of the band. In practical terms, the current OOB limits likely will prevent operators from deploying 20 MHz LTE channels in the 3.5 GHz Band. CTIA urges the Commission to adopt an approach that will permit deployment of 20 MHz LTE channels, which will make more efficient use of spectrum resources and permit higher quality of service to consumers.

In the *3.5 GHz Order*, the FCC adopted a stringent -25 dBm/MHz emission limit at frequencies more than 10 MHz outside each channel.<sup>7</sup> However, for 20 MHz LTE channels, the separation from channel-edge must be at least 20 MHz to meet the -25 dBm/MHz limit without significantly reducing power levels (*i.e.*, engaging in approximately 3 dB A-MPR). This problem applies throughout the 3.5 GHz Band and impacts PAL and GAA operations equally. Notably, the *Further Notice* in this proceeding proposed to apply a -13 dBm/MHz limit throughout the band and acknowledged that the limit would have been consistent with the limits in many other mobile bands.<sup>8</sup> To avoid forcing power backoff and the resulting coverage issues for 20 MHz channels, the Commission should apply the -25 dBm/MHz emission limit only at

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<sup>7</sup> *Id.* ¶ 183.

<sup>8</sup> *Id.* ¶ 176 (“We proposed applying the long-standing OOB attenuation requirement of  $43 + 10 \log(P)$  dB (equivalent to -13 dBm/MHz), to all emissions from CBSDs and End User Devices outside of any channel assigned by the SAS.”).

frequencies more than 20 MHz outside each channel, and the -13 dBm/MHz limit should apply from 0-20 MHz outside the assigned channel-edge. These proposed changes are designed to allow the emissions mask to scale with bandwidth, and recognize that wider bandwidth transmission channels require a wider roll-off bandwidth.

Additionally, the FCC adopted a very stringent -40 dBm/MHz OOB limit just 20 MHz off of both band edges, below 3530 MHz and above 3720 MHz, that will similarly force 20 MHz LTE operations to implement A-MPR.<sup>9</sup> Such stringent levels so close to the band edge are unnecessary to protect services in adjacent bands. Therefore, the Commission should remove the -40 dBm/MHz OOB limit below 3530 MHz and above 3720 MHz, applying the revised channel edge limits identified above. In the alternative, should the Commission determine the -40 dBm/MHz limit is necessary to protect adjacent operations, the Commission should increase the transition gap to 40 MHz for 20 MHz LTE channels to operate with less power backoff.

Finally, the Commission should modify its measurement procedures to employ the more typically used RMS detector instead of a peak detector as adopted in the *3.5 GHz Order*.<sup>10</sup> The Commission's rules allow for average power measurements using an RMS detector for virtually all licensed mobile operations.<sup>11</sup> The decision here to use a peak detector, which was not accompanied by any discussion in the *3.5 GHz Order*, will require all forms of LTE (and other technologies) to operate at substantially lower transmit power levels. For example, the peak-to-

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<sup>9</sup> *Id.* ¶ 183.

<sup>10</sup> 47 C.F.R. § 96.41 (e)(3)(iii); *3.5 GHz Order* at 4116.

<sup>11</sup> *See, e.g.*, 47 C.F.R. § 27.50(d)(6) (“Peak transmit power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage.”); 47 C.F.R. § 27.50(i) (same); 47 C.F.R. § 27.50(b)(11) (“[M]aximum composite transmit power shall be measured over any interval of continuous transmission using instrumentation calibrated in terms of RMS-equivalent voltage.”); 47 C.F.R. § 27.50(c)(11) (“Licensees may employ equipment operating in compliance with either the measurement techniques described in paragraph (b)(11) of this section [that is, an RMS detector] or a Commission-approved average power technique.”).

average ratio for emissions from LTE signals can easily exceed 10 dB. Forcing 3.5 GHz users to operate with that much less power would effectively cripple the band's ability to support mobile broadband operations. For these reasons, the Commission should specify an RMS detector in the measurement procedures instead of a peak detector.

**V. THE FCC SHOULD INCREASE POWER LIMITS TO ALLOW FOR REASONABLE INDOOR AND OUTDOOR COVERAGE.**

The conducted power and effective isotropic radiated power (“EIRP”) limits set forth in the *3.5 GHz Order* do not allow for comprehensive indoor and outdoor coverage. First, the conducted power and EIRP limits for Category A Citizens Band Radio Service Devices (“CBSDs”) are not high enough to allow for significant indoor coverage. The Commission should increase the conducted power limit to 30 dBm and the EIRP limit to 36 dBm for Category A CBSDs.<sup>12</sup> This limit would be consistent with conventional unlicensed power levels for indoor use and would allow for reasonable indoor coverage.

Similarly, the conducted power and EIRP limits for Category B CBSDs are not high enough to provide significant outdoor coverage without the use of high gain, directional antennas.<sup>13</sup> However, in many urban areas, sectorized installations are not practical, and operators will be unable to realize the full benefits of the power limits. The Commission should therefore increase the maximum EIRP to 49 dBm for Category B non-rural CBSDs. The Commission should allow operators the flexibility to increase conducted power in exchange for lowering antenna gain, up to a maximum of 40 dBm conducted power. Finally, the Commission should likewise increase the maximum conducted power for Category B CBSDs in rural areas to

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<sup>12</sup> The *3.5 GHz Order* adopted a maximum conducted power limit of 24 dBm and an EIRP limit of 30 dBm for Category A CBSDs. *3.5 GHz Order* ¶ 213.

<sup>13</sup> The *3.5 GHz Order* adopted a maximum conducted power limit of 24 dBm and an EIRP limit of 40 dBm for Category B CBSDs in non-rural areas. *Id.*

40 dBm, and increase the maximum EIRP to a total of 56 dBm.<sup>14</sup> Granting the requested increases in maximum conducted power and EIRP limits will allow for comprehensive outdoor coverage.

## VI. CONCLUSION.

The Commission should reconsider the *3.5 GHz Order* as set forth above to foster the necessary investment and innovation in the 3.5 GHz Band and to include technical limits that allow for comprehensive coverage for both indoor and outdoor applications.

Respectfully submitted,

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<sup>14</sup> The *3.5 GHz Order* adopted a maximum conducted power limit of 30 dBm and an EIRP limit of 47 dBm for Category B CBSDs in rural areas. *Id.*