

June 11, 2024

Mr. Ronald T. Repasi  
Chief, Office of Engineering and Technology (OET)  
Federal Communications Commission  
45 L Street, NE  
Washington, DC 20554

Mr. Joel Taubenblatt  
Chief, Wireless Telecommunications Bureau (WTB)  
Federal Communications Commission  
45 L Street, NE  
Washington, DC 20554

Re: Promoting Investment in the 3550-3700 MHz Band  
GN Docket Nos. 15-319 and 17-258

Dear Messrs. Repasi and Taubenblatt:

By this letter, the National Telecommunications and Information Administration (NTIA) provides notice, as part of the above-referenced proceedings,<sup>1</sup> of permissible changes to the aggregate interference model that Spectrum Access System (SAS) administrators use to protect federal operations in the 3.55-3.7 GHz (3.5 GHz) band from Citizens Broadband Radio Service (CBRS) users.<sup>2</sup> As described below, NTIA requests that the Commission permit certified SAS administrators to modify the existing aggregate interference model by adding Time Division

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<sup>1</sup> See, e.g., *Amendment of the Commission's Rules with Regard to Commercial Operations in the 3550-3650 MHz Band*, GN Docket No. 12-354, Report and Order and Second Further Notice of Proposed Rulemaking, 30 FCC Rcd 3959 (2015); *Amendment of the Commission's Rules with Regard to Commercial Operations in the 3550-3650 MHz Band*, GN Docket No. 12-354, Order on Reconsideration and Second Report and Order, 31 FCC Rcd 5011 (2016); *Promoting Investment in the 3550-3700 MHz Band*, GN Docket No. 17-258, Order, 33 FCC Rcd 4987 (WTB/OET 2018); *WTB And OET Approve Four Spectrum Access System Administrators For Full Scale Commercial Deployment In The 3.5 GHz Band And Emphasize Licensee Compliance Obligations In The 3650-3700 MHz Band Under Part 96*, GN Docket No. 15-319, Public Notice, 35 FCC Rcd 117 (WTB/OET 2020).

<sup>2</sup> See Letter from Paige R. Atkins, Assoc. Admin., Office of Spectrum Mgt., NTIA, to Julius P. Knapp, Chief, Office of Eng. and Tech. and Donald K. Stockdale, Jr., Chief, Wireless Telecom. Bureau, FCC (May 17, 2018) (*NTIA 2018 Letter*), <https://www.ntia.doc.gov/fcc-filing/2015/ntia-letter-fcc-commercial-operations-3550-3650-mhz-band>; <https://www.fcc.gov/ecfs/search/search-filings/filing/10530233711963>. See also Letter from Charles Cooper, Assoc. Admin., Office of Spectrum Mgt., NTIA, to Ronald T. Repasi, Chief, OET, and Donald Stockdale, Jr., Chief, WTB, FCC (Jan. 22, 2020), <https://www.ntia.doc.gov/fcc-filing/2015/ntia-letter-fcc-commercial-operations-3550-3650-mhz-band>; *Promoting Investment in the 3550-3700 MHz Band*, Order, 33 FCC Rcd 4987 (2018) (*DPA Waiver Order*), <https://www.fcc.gov/document/3550-3700-mhz-waiver-order>.

Duplex (TDD)<sup>3</sup> and loading factors,<sup>4</sup> accounting for clutter loss,<sup>5</sup> and using a 50% confidence factor and 50% reliability factor for the propagation loss calculations.<sup>6</sup> These changes to the aggregate interference model are intended to improve shared access to the 3.5 GHz band by: (1) reducing the size of Dynamic Protection Area (DPA) neighborhoods along the coastlines and around federal facilities throughout the country;<sup>7</sup> (2) decreasing the number of Citizens Broadband Radio Service Device (CBSD) grants that are suspended when a DPA is activated; and (3) increasing the fidelity of the propagation modeling due to higher confidence through experience. Significantly, SAS administrators that successfully implement these changes should be able to authorize service to approximately **72 million more people** (for a total of approximately 240 million) nationwide without periodic service adjustments to protect federal operations, while also providing greater spectrum access within DPA neighborhoods due to fewer and less frequent grant suspensions.<sup>8</sup>

Consistent with our established coordination procedures for the 3.5 GHz band<sup>9</sup> and the Commission's rules, NTIA requests that the Commission permit the SAS administrators to apply the following changes to the aggregate interference model used to protect federal operations in the band:

- The SAS administrators can be permitted to assume an 80% TDD activity factor and 20% network loading factor for each CBSD in the aggregate interference calculation. The total

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<sup>3</sup> Time Division Duplex (TDD) uses different time slots for uplink and downlink signals over the same frequency (for a CBSD transmitter).

<sup>4</sup> Network Loading Factors are the traffic load of base stations across a network (or part thereof).

<sup>5</sup> Clutter Loss is the difference in the transmission loss or basic transmission loss with and without the presence of terminal clutter at either end of the path with all other path details being the same.

<sup>6</sup> Path Loss (or transmission loss) is the reduction in power density (attenuation) of an electromagnetic wave as it propagates through space.

<sup>7</sup> DPAs are pre-defined protection areas that extend beyond the coastline or that enclose a protected terrestrial radar facility, which may be activated or deactivated as necessary to protect DoD radar systems. *See DPA Waiver Order*. Specific coordinates for the DPAs and DPA neighborhood areas are available at <https://www.ntia.doc.gov/fcc-filing/2015/ntia-letter-fcc-commercial-operations-3550-3650-mhz-band>.

<sup>8</sup> Nothing in this letter should be read to supersede the obligation for CBRS users to comply with the Commission's CBRS rules, including 47 CFR §96.15(a)(1) ("CBSDs and End User Devices must not cause harmful interference to and must accept interference from federal Incumbent Users authorized to operate in the 3550-3700 MHz band and below 3550 MHz"). In addition, CBRS users' CBSDs operated outside of DPA neighborhoods would still be subject to pre-emption pursuant to the War Powers clause of the Communications Act. *See* 47 USC §606, 47 CFR §96.15(a)(4) ("[i]f the President of the United States (or another designated Federal Government entity) issues instructions to discontinue use of CBSDs pursuant to 47 USC §606, SAS Administrators must instruct CBSDs to cease operations as soon as technically possible").

<sup>9</sup> *See, e.g.*, Letter from Charles Cooper, Associate Administrator, Office of Spectrum Management, NTIA, to Ronald T. Repasi, Acting Chief, OET, FCC, and Donald K. Stockdale, Jr., Chief, Wireless Telecommunications Bureau, FCC (June 23, 2020) (on file in GN Docket No. 17-258) (modifying protection criteria for 11 port facilities).

impact will reduce, by 8 dB, the Equivalent Isotropic Radiated Power (EIRP) used in the aggregate interference calculations for each CBSD.<sup>10</sup>

- The SAS administrators can be permitted to use median Irregular Terrain Model (ITM) terrain dependent propagation loss (in dB)—using reliability and confidence factors of 0.5—to calculate the aggregate received power levels within a DPA. The ITM was developed by NTIA’s Institute of Telecommunications Sciences.<sup>11</sup>
- The SAS administrators can be permitted to apply median clutter loss—calculated using the methodology described in Recommendation ITU-R P.2108,<sup>12</sup> section 3.2—for any CBSD with an antenna height Above Ground Level (AGL) of less than or equal to 6 meters, that is operating at a distance of at least 250 meters from a DPA boundary.

NTIA respectfully requests that the Commission permit the SAS administrators to apply these refinements to the aggregate interference model only after acceptance testing—including testing in a non-operational environment—demonstrating their ability to effectively implement these changes.

Approximately 168 million people live outside of the current Category B DPA Neighborhoods.<sup>13</sup> After the SAS administrators implement the refined model outlined here and the Category B DPA neighborhoods are reduced accordingly, the total number of people outside Category B DPA neighborhoods should increase to 240 million people nationwide. Although the affected population is distributed throughout the country, some of the most notable increases should be in the states and urban areas listed below.<sup>14</sup> After the SAS administrators implement these changes, CBRS operations in these areas would no longer be subject to required pre-emption that protects federal operations.

State	Population Increase
Texas	9,265,249
Pennsylvania	8,115,375
North Carolina	7,985,493
Georgia	7,871,790
Arizona	4,534,721
California	4,403,507
New York	4,033,110
Oklahoma	3,582,029
Maryland	3,441,464
South Carolina	2,897,046

<sup>10</sup>  $80\% \times 20\% = 16\%$

$10 \log_{10}(0.16) = -8 \text{ dB}$

<sup>11</sup> <https://github.com/NTIA/itm>

<sup>12</sup> <https://www.itu.int/rec/R-REC-P.2108/en>

<sup>13</sup> Category B for CBRS allows comparatively higher-power operation. See 47 CFR §§96.41, 96.45.

<sup>14</sup> <https://www.census.gov/programs-surveys/geography/guidance/geo-areas/urban-rural.html>

<b>Virginia</b>	2,829,432
<b>Alabama</b>	2,654,720
<b>Nevada</b>	2,009,216
<b>Louisiana</b>	1,449,871
<b>Mississippi</b>	1,426,322
<b>West Virginia</b>	1,287,504
<b>Arkansas</b>	1,201,391

<b>Urban Area</b>	<b>Population Increase</b>
<b>Atlanta, GA</b>	4,232,044
<b>Phoenix--Mesa--Scottsdale, AZ</b>	3,328,098
<b>Las Vegas--Henderson--Paradise, NV</b>	1,815,938
<b>San Antonio, TX</b>	1,618,685
<b>Pittsburgh, PA</b>	1,557,003
<b>Baltimore, MD</b>	1,540,336
<b>Washington--Arlington, DC--VA--MD</b>	1,396,928
<b>Austin, TX</b>	1,207,721
<b>Charlotte, NC--SC</b>	1,050,610
<b>Sacramento, CA</b>	1,017,790

NTIA and the Department of Defense (DoD) have worked closely with the Commission as it has implemented rules governing CBRS, for which the Commission established a groundbreaking spectrum-sharing paradigm that has enabled commercial access to mid-band spectrum for next-generation wireless deployments (including 5G). The successful ongoing evolution of CBRS spectrum-sharing demonstrates how a collaborative partnership among government and industry stakeholders can facilitate meaningful spectrum-sharing and critical spectrum access while protecting key government systems vital for national security and other public services.

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NTIA looks forward to continuing its collaboration with the Commission, DoD, and industry to protect the federal 3.5 GHz band radar systems while minimizing constraints on Citizens Broadband Radio Service operations. Should you have any questions, please contact me

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or Edward Drocella, Chief, Spectrum Engineering and Analysis Division, Office of Spectrum Management, at edrocella@ntia.gov or (202) 482-2608.

Sincerely,

/s/

Charles Cooper  
Associate Administrator  
Office of Spectrum Management