

April 25, 2018

Marlene Dortch, Secretary  
Federal Communications Commission  
445 12th Street SW  
Washington, DC 20554

*Re: Promoting Investment in the 3550-3700 MHz Band*, GN Docket No. 17-258

Dear Ms. Dortch,

The American Petroleum Institute, Edison Electric Institute, Enterprise Wireless Alliance, Exelon Corporation, General Electric Company, Google LLC, Hospitality Technology Next Generation, Motorola Solutions, Inc., pdvWireless, Inc., Port of Los Angeles, Southern Linc, Union Pacific, and Utilities Technology Council hereby respond to recent, overstated assertions by AT&T Services, Inc. (“AT&T”) and T-Mobile USA, Inc. (“T-Mobile”) regarding the feasibility of urban deployments under the existing 3.5 GHz rules. AT&T and T-Mobile assert that “practical deployment issues” might arise for large carriers in urban areas if the Federal Communications Commission (the “Commission”) retains its existing rules for licensing spectrum in the 3.5 GHz band by census tract.<sup>1</sup> Once again,<sup>2</sup> AT&T and T-Mobile insist that the Commission’s goal should be to build its Citizens Broadband Radio Service (“CBRS”) licensing rules specifically and solely to ease deployments by large commercial carriers—even if these rules prevent other potential “Citizen” licensees, such as industrial IoT systems, Critical Infrastructure (“CII”) proponents, and venue owners, from practical access to the band. But the Commission has previously and rightly concluded that its rules should ensure that the 3.5 GHz band remains compatible with the full range of users and business models that the CBRS rules were intended to support in urban areas.<sup>3</sup>

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<sup>1</sup> Letter from Stacey Black, AT&T Services, Inc. to Marlene H. Dortch, Secretary, Federal Communications Commission, at 1, GN Docket No. 17-258 (filed Apr. 5, 2018) (“AT&T Letter”); Letter from Steve Sharkey, T-Mobile USA, Inc. to Marlene H. Dortch, Secretary, Federal Communications Commission, at 1, GN Docket No. 17-258 (filed Feb. 14, 2018) (“T-Mobile Letter”).

<sup>2</sup> *See generally* Comments of AT&T Services, Inc., GN Docket No. 17-258 (filed Dec. 28, 2017); Comments of T-Mobile USA, Inc., GN Docket No. 17-258 (filed Dec. 28, 2017).

<sup>3</sup> *See, e.g., Promoting Investment in the 3550-3700 MHz Band et al.*, Notice of Proposed Rulemaking and Order Terminating Petitions, FCC 17-134, 32 FCC Rcd. 8071, 8072 ¶ 2 (2017) (“NPRM”); *Id.*, Statement of Commissioner O’Rielly at 8110-8111; Remarks of Commissioner O’Rielly before the Policy Forum at AT&T: The 3.5 GHz Future Innovations Showcase at 3 (Feb. 3, 2018) (“[T]he Commission must not create a licensing model that is intended to appeal to some entities and uses while dissuading others. We must avoid

To support their claims, AT&T and T-Mobile highlight a single implausible scenario in an attempt to show that the existing rules do not easily support large-carrier business models. The Commission should recognize this example as only one of many possible deployment scenarios for major carriers, which is not demonstrative of the utility of the band for all carriers' deployments over multiple contiguous census tracts, much less those of other potential innovative users. What is more informative is the ongoing investment to commercialize CBRS for every "Citizen," including the carriers themselves, running counter to large commercial carriers' claim that the rules are incompatible with 5G deployments.

AT&T and T-Mobile base their claims about the unworkability of the existing rules on a single example of a potential Citizens Broadband Radio Service Device ("CBSD") that is not representative of real-world deployments, in one major metropolitan area with fragmented census tract ownership. Both companies examined the same urban census tract—the one within which Commission headquarters is located. They reach the predictable conclusion that operation of a single high-antenna-height, high-power CBSD within a dense urban area, apparently sited and pointed without regard to cross-border interference concerns, might cause interference to operations in adjoining tracts.<sup>4</sup> This singular example does not support the conclusion that larger areas would more effectively achieve the Commission's goals than would census tracts. Rather, their analysis demonstrates only that, in the unlikely case that a bidder acquires a single urban Priority Access License ("PAL"), deployment of a single high-power transmitter would be a poor strategy for providing service within that PAL. The operations that AT&T and T-Mobile describe<sup>5</sup> would only be logical if a licensee had acquired multiple contiguous PALs with uniform channel assignments, which they would be free to pursue at auction and in the channel-assignment process—or, potentially, on a GAA basis.

A more realistic example of service for a licensee with a single PAL would be a geographically targeted LTE deployment, such as within a hotel, convention center, or business campus. If, for example, a hotel near the Commission's headquarters either (i) sought to provide neutral-host or private LTE service, or (ii) contracted with a carrier for a local network, the more appropriate operational strategy would be to deploy multiple low-power CBSDs indoors and perhaps also CBSDs covering selected outdoor spaces. This type of deployment would be unlikely to face any of the cross-border interference issues that AT&T and T-Mobile address, and would make effective and economically productive use of the band. It would also maximize the spectral reuse and capacity of the band, a central tenet of 5G cellular systems.

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trying to presuppose an outcome rather than allowing the market to fully function."), *available at* [https://apps.fcc.gov/edocs\\_public/attachmatch/DOC-349201A1.pdf](https://apps.fcc.gov/edocs_public/attachmatch/DOC-349201A1.pdf).

<sup>4</sup> AT&T Letter, Attachment at 12; T-Mobile Letter, Attachment at 6-8.

<sup>5</sup> AT&T Letter, Attachment at 3-7; T-Mobile Letter, Attachment at 7.

We urge the Commission not to favor large carriers that seek to “engineer[] for coverage”<sup>6</sup> but rather promote spectrally efficient and innovative new uses of CBRS spectrum with balanced PAL licensing rules. Path loss and propagation characteristics of the 3.5 GHz band are better suited for geographically targeted small-cell coverage, including IoT connectivity within an industrial facility, capacity enhancement in areas such as stadiums where usage is especially high, or private LTE services for CII, venue owners, and others.<sup>7</sup> In a more typical urban scenario, with CBSD deployments that are appropriate to the CBRS licensing and technical rules, only a small fraction of CBSDs would be affected by cross-border interference.

Even in the rare cases where cross-border interference might present an issue, it can be addressed while preserving the band’s flexibility for a variety of users. For example, under the existing rules, Spectrum Access System (“SAS”) administrators are encouraged to minimize the effect of cross-border interference by preferring channel assignments that prevent possible interference between licensees.<sup>8</sup> In addition, although AT&T claims that “[l]icensees cannot combine adjoining Census Tracts to simplify the network design,”<sup>9</sup> the existing rules require SAS operators to “assign geographically contiguous PALs held by the same Priority Access Licensee to the same channels in each geographic area, to the extent feasible.”<sup>10</sup> Therefore, a well-functioning SAS would avoid a deployment scenario where a high-power CBSD would operate co-channel with an “optimized” deployment on the National Mall. Instead, a SAS would place these systems on different channels whenever possible.

However, if the Commission adopts AT&T and T-Mobile’s proposal to abandon census tracts as the appropriate geographic license size in the CBRS band, based on this very limited example which reflects a single use case, potential local licensees would not be able to solve the problems created by large license areas. Dozens of prospective PAL licensees from a range of

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<sup>6</sup> AT&T Letter, Attachment at 5.

<sup>7</sup> See, e.g., *Amendment of the Commission’s Rules with Regard to Commercial Operations in the 3550-3650 MHz Band*, Notice of Proposed Rulemaking and Order, 27 FCC Rcd. 15594, 15602 ¶ 20 (2012); Comments of Google LLC at 2, GN Docket No. 17-258 (filed Dec. 28, 2017); Comments of AT&T at 6, GN Docket No. 12-354 (filed Feb. 20, 2013); Reply Comments of CTIA at 2, GN Docket No. 12-354 (filed Dec. 20, 2013).

<sup>8</sup> 47 C.F.R. § 96.25(b)(1)(i).

<sup>9</sup> AT&T Letter, Attachment at 4.

<sup>10</sup> The CBRS rules require SAS operators to facilitate this by “assign[ing] geographically contiguous PALs held by the same Priority Access Licensee to the same channels in each geographic area, to the extent feasible.” 47 C.F.R. § 96.25(b)(1)(i). Although this rule does not literally guarantee that adjacent PALs of a common licensee will be assigned to the same frequency, situations where this result is not feasible are likely to be rare, affecting only a small subset of all census tracts. Notably, the unusual combinations of licensees and exclusion zones that would cause a SAS not to assign the same frequencies to contiguous urban PALs would also generally be incompatible with PEA-based licensing. This means that, for every case where the Commission’s expanding license areas to PEAs will benefit large carriers by eliminating these rare scenarios, they will also frustrate the preferred network deployments of another operator.

industries have all stated unequivocally that such a dramatic expansion would effectively bar them from PAL operation.<sup>11</sup> Large license areas would prevent meaningful, if any, participation in the PAL spectrum auctions by forcing users to bid on areas far larger than their intended, targeted service areas.<sup>12</sup> The record, and history, make clear that the large commercial carriers'

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<sup>11</sup> See Comments of AirLink Internet Services at 1, GN Docket No. 17-258 (filed Dec. 27, 2017); Comments of Airosurf Communications, Inc. at 1, GN Docket No. 17-258 (filed Dec. 28, 2017); Comments of Tanner Bender, BDA Wireless, LLC at 1, GN Docket No. 17-258 (filed Dec. 28, 2017); Comments of BPS Networks at 1, GN Docket No. 17-258 (filed Dec. 28, 2017); Comments of Cal.net, Inc. at 2, GN Docket No. 17-258 (filed Dec. 28, 2017); Comments of CTIconnect, LLC at 1, GN Docket No. 17-258 (filed Dec. 28, 2017); Comments of Cyber Broadband Inc. at 2, GN Docket No. 17-258 (filed Dec. 28, 2017); Comments of DMCI Broadband, LLC at 1, GN Docket No. 17-258 (filed Dec. 27, 2017); Comments of DSLbyAir, Inc. at 1, GN Docket No. 17-258 (filed Dec. 26, 2017); Comments of Eastern Oregon Net, Inc. at 2, GN Docket No. 17-258 (filed Dec. 28, 2017); Comments of e-vergent.com, LLC at 2, GN Docket No. 17-258 (filed Dec. 26, 2017); Comments of Grand County Internet Services Inc. at 1, GN Docket No. 17-258 (filed Dec. 28, 2017); Comments of In the Stix Broadband at 1, GN Docket No. 17-258 (filed Dec. 28, 2017); Comments of Link Technologies, Inc. at 3, GN Docket No. 17-258 (filed Dec. 28, 2017); Comments of New Lisbon Telephone Company, Inc. at 1, GN Docket No. 17-258 (filed Dec. 22, 2017); Comments of Pearl Creek Broadband LLC at 1, GN Docket No. 17-258 (filed Dec. 28, 2017); Comments of Portative Technologies, LLC at 1, GN Docket No. 17-258 (filed Dec. 29, 2017); Comments of Q-Wireless, LLC at 1, GN Docket No. 17-258 (filed Dec. 27, 2017); Comments of Rocket Communications Corp. at 2, GN Docket No. 17-258 (filed Dec. 28, 2017); Comments of Shelby Broadband at 1, GN Docket No. 17-258 (filed Dec. 27, 2017); Comments of SmartBurst LLC at 1, GN Docket No. 17-258 (filed Dec. 28, 2017); Comments of Verso Networks at 1, GN Docket No. 17-258 (filed Dec. 27, 2017); Comments of Vertical Broadband, LLC at 4, GN Docket No. 17-258 (filed Dec. 21, 2017); *see also* Comments of Amplex Electric, Inc. at 1, GN Docket No. 17-258 (filed Dec. 27, 2017) ("Amplex Electric Comments"); Comments of Baicells Technologies North America at 4, GN Docket No. 17-258 (filed Dec. 27, 2017); Comments of Bolt Internet Inc. at 1, GN Docket No. 17-258 (filed Dec. 27, 2017); Comments of Broadband Corp at 1, GN Docket No. 17-258 (filed Dec. 28, 2017); Comments of Cirrinity Wireless, LLC at 2, GN Docket No. 17-258 (filed Dec. 29, 2017); Comments of Express Dial Internet, Inc. dba KWISP Internet at 4, GN Docket No. 17-258 (filed Dec. 28, 2017); Comments of InfoWest, Inc. at 1, GN Docket No. 17-258 (filed Dec. 28, 2017); Comments of Intelligent Computing Solutions at 1, GN Docket No. 17-258 (filed Dec. 28, 2017); Comments of The Junction Internet LLC at 1-2, GN Docket No. 17-258 (filed Dec. 28, 2017); Comments of Kentucky Wimax at 2, GN Docket No. 17-258 (filed Dec. 26, 2017); Comments of New Wave Net Corp. at 1-2, GN Docket No. 17-258 (filed Dec. 28, 2017) ("New Wave Net Corp. Comments"); Comments of OnlineNW at 2, GN Docket No. 17-258 (filed Dec. 28, 2017); Comments of On-Ramp Indiana, Inc. at 1, GN Docket No. 17-258 (filed Dec. 26, 2017); Comments of Ridgetop Networks, LLC at 1, GN Docket No. 17-258 (filed Dec. 28, 2017); Comments of Royell Communications, Inc. at 1, GN Docket No. 17-258 (filed Dec. 28, 2017); Comments of Rural Broadband Network Services dba HighSpeedLink.net at 6, GN Docket No. 17-258 (filed Dec. 27, 2017); Comments of Sandhills Wireless, LLC at 1, GN Docket No. 17-258 (filed Dec. 28, 2017); Comments of Smart Way Communications, LLC at 1, GN Docket No. 17-258 (filed Dec. 27, 2017); Comments of Softcom Internet Communications, Inc. at 1, GN Docket No. 17-258 (filed Dec. 28, 2017); Comments of Southern Internet, Inc. at 3, GN Docket No. 17-258 (filed Dec. 28, 2017); Comments of Virginia Everywhere, LLC dba All Points Broadband at 2, GN Docket No. 17-258 (filed Dec. 28, 2017); Comments of Wonderlink Communications at 1-2, GN Docket No. 17-258 (filed Dec. 28, 2107).

<sup>12</sup> It will do the same for large carriers. But their particular business models make them uniquely suited to tolerating such spectrum acquisition costs. Therefore, instead of being effectively barred from the auction,

actions virtually eliminate any realistic chance that prospective licensees with more targeted spectrum needs will be able to acquire the spectrum they need on the secondary market.<sup>13</sup> Economic analyses of the large commercial carriers' proposal have confirmed that expanding license areas to PEAs would inappropriately and unnecessarily force "local users with high-value uses to bargain with a third party that controls their access"<sup>14</sup> and therefore "artificially limit the range of diverse users that may simultaneously co-exist and operate in the CBRS spectrum, thereby defeating a key goal of spectrum policy."<sup>15</sup>

The record also makes clear that there is no merit to carriers' concerns about the purported infeasibility of conducting PAL auctions under the existing rules. Verizon's own economist, as well as Dr. Paul Milgrom, agree that there is no technical reason why it would be infeasible for the Commission to conduct these auctions.<sup>16</sup> Issues associated with bidding on a large number of licenses can be resolved through the design of auction software.<sup>17</sup> This issue does not warrant a fundamental reconsideration of the auction rules that would exclude most other prospective PAL licensees from the market.

Some claim that only large license sizes will facilitate investment in the 3.5 GHz band,<sup>18</sup> but this is clearly not the case. For example, Nokia recently visited the Commission to showcase the "end-to-end solution" it has developed, which includes a SAS, Environmental Sensing Capability, CBSD small-cell devices, and other equipment.<sup>19</sup> This represents significant investment under the current rules. Likewise, T-Mobile, AT&T, Verizon, and others have continued to conduct trial deployments,<sup>20</sup> and have already made ambitious announcements

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expansion of license areas to PEAs makes large carriers the likely *winners* of PAL auctions under their proposed rules.

<sup>13</sup> See Amplex Electric Comments at 2; Comments of Bernhardt Communications Company at 3, GN Docket No. 17-258 (filed Dec. 26, 2017); Comments of Comcast Corporation at 13, GN Docket No. 17-258 (filed Dec. 28, 2017); New Wave Net Corp. Comments at 1; Comments of Union Pacific at 10, GN Docket No. 17-258 (filed Dec. 28, 2017); Comments of Vivint Wireless, Inc. in Response to the Notice of Proposed Rulemaking at 5, GN Docket No. 17-258 (filed Dec. 28, 2017).

<sup>14</sup> Letter from Paul Milgrom, Auctionomics, to Marlene H. Dortch, Secretary, Federal Communications Commission, ¶ 4, GN Docket No. 12-354 (Aug. 7, 2017) ("Milgrom Letter").

<sup>15</sup> William Lehr, Analysis of Proposed Modifications to CBRS PAL Framework 13 (Dec. 28, 2017)

<sup>16</sup> See Daniel R. Vincent, *Secondary Markets, License Terms and Priority Access Licenses* 3, GN Docket No. 17-258 (filed Dec. 29, 2017); Milgrom Letter ¶ 6.

<sup>17</sup> See Milgrom Letter ¶ 20.

<sup>18</sup> See, e.g., T-Mobile Letter, Attachment at 4.

<sup>19</sup> See generally Letter from Jeffrey A. Marks, Nokia, to Marlene H. Dortch, Federal Communications Commission, GN Docket Nos. 15-319, 17-183, 17-258 (filed Mar. 26, 2018).

<sup>20</sup> See, e.g., Experimental Special Temporary Authorization for AT&T Services Inc., ELS File No. 1803-EX-ST-2017, Call Sign WM9XEI (granted Jan. 5, 2018), *available at*

about the imminent availability of commercial CBRS service. Verizon recently announced that “CBRS is a key component of [its] technology strategy” and that it will add CBRS-capable smartphones to its product lineup by the end of the year.<sup>21</sup> Moreover, numerous Wireless Internet Service Providers have already begun to invest significant sums to prepare their networks for CBRS—60% of whom have done so specifically in reliance on the existing rules.<sup>22</sup> This significant investment and innovation has already occurred under the existing rules. With the right rules, experts have estimated the potential economic value of CBRS spectrum to be as much as \$260 billion.<sup>23</sup> Equipment maker Ruckus Networks has estimated the market for CBRS equipment alone to be worth \$1 billion.<sup>24</sup> But these economic opportunities as well as many existing investments would be jeopardized if the Commission reverts to traditional area-licensing strategies which prioritize compatibility with the business models of large commercial carriers above overall efficiency and accessibility for a wide range of users.

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<https://apps.fcc.gov/els/GetAtt.html?id=202930&x=>; Experimental Special Temporary Authorization for T-Mobile USA, Inc., ELS File No. 0497-EX-ST-2018, Call Sign WL9XUP (granted Mar. 27, 2018), *available at* <https://apps.fcc.gov/els/GetAtt.html?id=207133&x=>; *see also* Monica Allevan, *T-Mobile continues tests in 3.5 GHz CBRS band, seeks extension on STA in Vegas*, FierceWireless (Mar. 19, 2018, 8:05 AM), <https://www.fiercewireless.com/wireless/T-Mobile-continues-tests-3-5-ghz-cbrs-band-seeks-extension-sta-vegas>; Monica Allevan, *T-Mobile eyes GAA use of 3.5 GHz band ahead of licensed availability*, FierceWireless (Feb. 26, 2018, 1:01 PM), <https://www.fiercewireless.com/wireless/T-Mobile-eyes-gaa-use-3-5-ghz-band-ahead-licensed-availability>; Monica Allevan, *AT&T files to conduct 3.5 GHz tests in Washington, D.C., with Ericsson gear*, FierceWireless (Dec. 20, 2017, 2:26 PM), <https://www.fiercewireless.com/wireless/at-t-files-to-conduct-3-5-ghz-tests-washington-d-c-ericsson-gear>

<sup>21</sup> Monica Allevan, *Verizon: We'll have CBRS 3.5Ghz devices by end of 2018*, FierceWireless (Apr. 5, 2018, 3:31 PM), <https://www.fiercewireless.com/wireless/verizon-we-ll-have-cbrs-3-5-ghz-devices-by-end-2018>.

<sup>22</sup> Comments of the Wireless Internet Service Providers Association, Appendix A at A-1, GN Docket No. 17-258 (filed Dec. 28, 2017).

<sup>23</sup> Alistair Barr, Mark Bergen, & Scott Moritz, *Carriers Are Hoarding America's Bandwidth. Google Just Wants Them to Share*, Bloomberg (Mar. 29, 2018, 6:00 AM), <https://www.bloomberg.com/news/articles/2018-03-29/google-led-plan-to-upend-wireless-industry-gains-momentum>.

<sup>24</sup> Mike Dano, *Arris/Ruckus lays out CBRS opportunity: \$1B by 2022*, FierceWireless (Mar. 28, 2018, 12:15 PM), <https://www.fiercewireless.com/tech/arris-ruckus-lays-out-cbrs-opportunity-1b-by-2022>.

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The Commission should adhere to its previous conclusion that census-tract-sized licenses reasonably balance the needs and preferences of various potential PAL licensees and reject calls to favor any one set of companies. Census tracts support the widest possible range of potential licensees and business plans, including the promising industrial IoT and venue-specific uses that the physical characteristics of the 3.5 GHz band would support so well. Accordingly, any potential revision to the CBRS rules must ensure that census-tract license areas remain available everywhere, including urban areas, to ensure that potential new entrants have meaningful access to PAL spectrum precisely where it would be most valuable for capacity building and other targeted uses.

Respectfully submitted,

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