

**Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, DC 20554**

In the Matter of )  
 )  
Amendment of the Commission's Rules with )  
Regard to Commercial Operations in the 3550- ) GN Docket No. 12-354  
3650 MHz Band )

**COMMENTS OF T-MOBILE USA, INC.**

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**COMMENTS OF T-MOBILE USA, INC.**

T-Mobile USA, Inc. (“T-Mobile”)<sup>1/</sup> submits these comments in response to the April 23, 2014, Further Notice of Proposed Rulemaking (“*FNPRM*”) issued by the Commission in the above-referenced proceeding, seeking comment on proposed rules for a new Citizens Broadband Radio Service (“*CBRS*”) in the 3550-3650 MHz band (“*3.5 GHz Band*”).<sup>2/</sup> T-Mobile continues to appreciate and support the FCC’s efforts to make additional spectrum, including the 3.5 GHz Band, available for small cell technologies that will support mobile broadband networks. However, the proposed rules, by limiting how and where 3.5 GHz Band systems can be used by licensed entities, will impede the successful deployment of the band. The Commission should modify the proposed rules to promote the type of regulatory environment that will allow *all* entities to exploit the full potential of the spectrum.

**I. INTRODUCTION AND SUMMARY**

T-Mobile has been and continues to be an active participant in this proceeding.<sup>3/</sup> As it previously explained, the role of small cells and backhaul are becoming increasingly important in

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<sup>1/</sup> T-Mobile USA, Inc. is a wholly-owned subsidiary of T-Mobile US, Inc., a publicly traded company.

<sup>2/</sup> See *Amendment of the Commission’s Rules with Regard to Commercial Operations in the 3550-3650 MHz Band*, Further Notice of Proposed Rulemaking, GN Docket No. 12-354, FCC 14-49 (rel. Apr. 23, 2014) (“*FNPRM*”).

<sup>3/</sup> See *Amendment of the Commission’s Rules with Regard to Commercial Operations in the 3550-3650 MHz Band*, Notice of Proposed Rulemaking, 12 FCC Rcd. 15594 (2012) (“*NPRM*”); *Commission*

carriers' networks, and the 3.5 GHz Band can complement other spectrum to satisfy coverage and capacity needs.<sup>4/</sup> In particular, the 3.5 GHz Band can be used as a component of the heterogeneous access networks that mobile broadband providers are now deploying.<sup>5/</sup>

The FCC notes in the *FNPRM* that its goal is to adopt rules that promote efficient and widespread use of the 3.5 GHz Band for a variety of potential users.<sup>6/</sup> Toward this end, the Commission, building upon concepts originally raised in the *NPRM* and *Public Notice*, proposes a framework that would authorize small cell and other broadband uses of the 3.5 GHz Band on a shared basis with incumbent federal and non-federal users of the band.<sup>7/</sup> Specifically, based on recommendations from the President's Council of Advisors on Science and Technology ("PCAST"), the *FNPRM* proposes to establish a three-tiered framework for shared access to the band – Incumbent Access, Priority Access ("PA"), and General Authorized Access ("GAA") tiers – with oversight and enforcement through a Spectrum Access System ("SAS").<sup>8/</sup> The *FNPRM* also includes proposals for protecting incumbents, licensing spectrum to PA users using Priority Access Licenses ("PALs"), establishing technical criteria, and managing the SAS.

While T-Mobile appreciates the Commission's diligence and hard work over the last few years to develop its proposals for the 3.5 GHz Band, it continues to believe that the FCC's

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*Seeks Comment on Licensing Models and Technical Requirements in the 3550-3650 MHz Band*, Public Notice, 28 FCC Rcd. 15300 (2013) ("*Public Notice*"); *see also* Comments of T-Mobile USA, Inc., GN Docket No. 12-354 (filed Feb. 20, 2013) ("T-Mobile *NPRM* Comments"); Reply Comments of T-Mobile USA, Inc., GN Docket No. 12-354 (filed Apr. 5, 2013) ("T-Mobile *NPRM* Reply Comments"); Comments of T-Mobile USA, Inc., GN Docket No. 12-354 (filed Dec. 5, 2013) ("T-Mobile *Public Notice* Comments"); Reply Comments of T-Mobile USA, Inc., GN Docket No. 12-354 (filed Dec. 20, 2013) ("T-Mobile *Public Notice* Reply Comments").

<sup>4/</sup> See T-Mobile *NPRM* Comments at 4-5; T-Mobile *Public Notice* Comments at 2.

<sup>5/</sup> See T-Mobile *NPRM* Reply Comments at 2-3; T-Mobile *Public Notice* Comments at 2.

<sup>6/</sup> See *FNPRM* ¶ 8.

<sup>7/</sup> See *id.* ¶ 3.

<sup>8/</sup> See *id.* ¶ 5.

proposed framework can be further improved. For instance, while one of the premises of the *FNPRM* is to implement some of the PCAST recommendations, that spectrum use paradigm remains largely unproven. The public interest would be better served by limiting its more complete implementation to GAA spectrum – rather than attempting to overlay it on licensed PAL spectrum, where user devices will be controlled by a licensee’s network. As T-Mobile has explained before, clear, exclusive spectrum is the most effective way for carriers to deploy services to consumers.<sup>9/</sup> While the spectrum that will be licensed in the 3.5 GHz Band will be encumbered, the Commission should not further limit its utility by subjecting it to the full range of PCAST recommendations. Instead, the Commission should implement the PCAST’s sharing recommendations – including giving the SAS significant authority over spectrum management – only in the GAA segment of the band.

To the extent the Commission adopts its proposed three-tiered approach, a stable supply of 3.5 GHz Band spectrum for licensed use with more traditional licensing rules is necessary to promote the device ecosystem and use of the band, ultimately creating a more robust market for unlicensed operations that will also use the spectrum. T-Mobile therefore recommends that, *first*, the Commission should re-evaluate its allocation of spectrum between PA and GAA users and set a floor of 40 megahertz of spectrum for PA use. *Second*, because the proposed Exclusion Zones are unnecessarily large, the Commission should re-evaluate the protections afforded to federal incumbents. *Third*, PALs should be issued using more traditional licensing mechanisms – *i.e.*, using areas larger than census tracts, at fixed frequencies, and for terms greater than one

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<sup>9/</sup> See, e.g., T-Mobile *NPRM* Comments at 10; see also T-Mobile *Public Notice* Comments at 2-3; T-Mobile USA, Inc. Response to House White Paper on Modernizing U.S. Spectrum Policy, at 4-5 (filed Apr. 25, 2014), available at [http://energycommerce.house.gov/sites/republicans.energycommerce.house.gov/files/analysis/CommActUpdate/WP2\\_Responses\\_43-58.pdf](http://energycommerce.house.gov/sites/republicans.energycommerce.house.gov/files/analysis/CommActUpdate/WP2_Responses_43-58.pdf).

year. *Fourth*, the FCC’s technical rules should accommodate a wide variety of applications, allowing higher power levels for licensed services. *Finally*, the role of the SAS as well as any necessary reporting requirements to the SAS should be limited, particularly as it relates to licensed spectrum.

## **II. THE COMMISSION SHOULD RE-EVALUATE ITS DIVISION OF SPECTRUM**

The Commission proposes reserving a minimum of 50 percent of the spectrum in any given census tract – after accounting for frequencies reserved for the Incumbent Access tier – for GAA use, with the remainder for PA licensees.<sup>10/</sup> It also proposes to allow opportunistic GAA use of “unused” PAL channels and asks how “use” of a PAL should be determined.<sup>11/</sup>

The FCC’s proposed division of spectrum will not create widespread and diverse use of the 3.5 GHz Band. Instead, and as T-Mobile previously explained, reserving a specific amount of spectrum in the 3.5 GHz Band for exclusive licensing would facilitate greater spectrum use.<sup>12/</sup> Not only would creating a specific reservation of spectrum for licensed use simplify sharing by allowing licensees to directly coordinate their operations with incumbent users,<sup>13/</sup> but it would also provide the certainty that carriers need to invest and develop a robust equipment market.<sup>14/</sup> Unlicensed users would, in turn, benefit from the economies of scale and scope that carriers would create and have more immediate access to cutting-edge equipment at reasonable prices.

Rather than permit the amount of available PA and GAA spectrum to fluctuate, the Commission should establish a floor of spectrum for licensed PA use. T-Mobile previously suggested that a defined amount of spectrum in each geographic area be reserved for licensed

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<sup>10/</sup> See *FNPRM* ¶ 28.

<sup>11/</sup> See *id.* ¶¶ 36-37.

<sup>12/</sup> See T-Mobile *NPRM* Comments at 8-9.

<sup>13/</sup> See *id.* at 8.

<sup>14/</sup> See T-Mobile *Public Notice* Comments at 9.

operations.<sup>15/</sup> T-Mobile recognizes that because of incumbent government and non-government operations, its earlier requests may result in GAA users having little capacity. Therefore, in order to preserve some spectrum for GAA use while ensuring sufficient PAL spectrum to generate market demand and interest, the Commission should impose a floor of 40 megahertz of spectrum for PAL use. Existing 3GPP standards contemplate spectrum use in 10- and 20-megahertz blocks, with the possibility of aggregating two 20-megahertz blocks into an effective 40-megahertz channel through channel bonding. Reserving 40 megahertz for PAL users will enable multiple entities to obtain PAL authorizations in a market for 20-megahertz blocks. If more than 40 megahertz of spectrum is made available, then the amount of spectrum over 40 megahertz should be evenly split between licensed and unlicensed operations. Adopting this approach presents a win-win as it would afford GAA users sufficient spectrum, especially if the Commission adopts its proposal to expand its framework to the 3650-3700 MHz band,<sup>16/</sup> while also promoting the development of a robust equipment ecosystem for the band.

T-Mobile also supports allowing GAA users to access PA spectrum when it is unassigned or affirmatively unused.<sup>17/</sup> In order to determine whether spectrum covered by a PAL is actually in use, PAL users should be required to notify the SAS when they initiate operations in an area. “Use” should be determined by self-reporting, and if a PAL user provides the necessary notification to the SAS that it has commenced operations, the PAL spectrum should *not* be made available for GAA users.

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<sup>15/</sup> See, e.g., *id.* at 3, 9 (urging the Commission to make 60 megahertz of spectrum available for PA use); T-Mobile *NPRM* Comments at 3, 8 (requesting that the Commission make at least 50 megahertz of spectrum available in the 3.5 GHz Band for licensed use).

<sup>16/</sup> See *FNPRM* ¶¶ 163-169.

<sup>17/</sup> See T-Mobile *Public Notice* Comments at 9-10.

### III. THE *FNPRM* PROVIDES GREATER INCUMBENT PROTECTIONS THAN WARRANTED

To protect federal incumbents, the FCC proposes requiring CBRS devices (“CBSDs”) – *i.e.*, base stations – to comply with the geographic Exclusion Zones established by the National Telecommunications and Information Administration (“NTIA”) in its Fast Track Report.<sup>18/</sup> Under this approach, commercial operations would not be permitted in the Exclusion Zones, which NTIA has determined would extend approximately one to 60 kilometers from ground-based and airborne radar systems and up to several hundred kilometers from certain high-power shipborne Naval radars.<sup>19/</sup> Recognizing that the conclusions of the Fast Track Report may no longer be appropriate, the FCC adds that it will work with NTIA to reassess these zones in the coming months and, if possible, plans to reduce these zones.<sup>20/</sup>

T-Mobile appreciates that the FCC recognizes it must work with NTIA to reassess the size and scope of Exclusion Zones, which are unrealistic for several reasons. *First*, the currently proposed Exclusion Zones effectively make the band unusable. As T-Mobile previously pointed out and the FCC acknowledged, the Exclusion Zones would cover approximately 60 percent of the United States population.<sup>21/</sup> This means that the 3.5 GHz Band would be unavailable to the majority of U.S. consumers, seriously diminishing its attractiveness to equipment manufacturers and therefore threatening any meaningful use of the band.

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<sup>18/</sup> See *FNPRM* ¶ 38; see also NTIA, *An Assessment of the Near-Term Viability of Accommodating Wireless Broadband Systems in the 1675-1710 MHz, 1755-1780 MHz, 3500-3650 MHz, 4200-4220 MHz, and 4380-4400 MHz Bands*, at iv (Oct. 2010) (“Fast Track Report”), available at [http://www.ntia.doc.gov/files/ntia/publications/fasttrackevaluation\\_11152010.pdf](http://www.ntia.doc.gov/files/ntia/publications/fasttrackevaluation_11152010.pdf).

<sup>19/</sup> See *FNPRM* ¶ 138.

<sup>20/</sup> See *id.* ¶ 140.

<sup>21/</sup> See T-Mobile *NPRM* Comments at 9; *NPRM* ¶ 6.

*Second*, the proposed Exclusion Zones are based on assumptions in the Fast Track Report that are no longer accurate with respect to use of the 3.5 GHz Band. The Exclusion Zones proposed by NTIA were based on the deployment of high-power, macrocell networks.<sup>22/</sup> However, the FCC expects to establish rules in this proceeding to permit lower-power small cell operations that could reduce the size of Exclusion Zones.<sup>23/</sup> Indeed, recent studies from NTIA’s Institute for Telecommunication Sciences explain that federal radar operations in the 3.5 GHz Band are limited, further reducing the potential harmful impact that 3.5 GHz Band operations could have on federal users.<sup>24/</sup>

*Third*, LTE and other technologies are being developed that can be used to ensure that non-incumbent operations protect incumbent users without simply excluding them from a broad geographic area. These technologies would allow both incumbent and non-incumbent operators to exist in the same band in the same area.<sup>25/</sup> As technology continues to advance, it is highly likely that Exclusion Zones will no longer be necessary at all.

*Finally*, rather than adopt Exclusion Zones for PALs, the Commission should employ Coordination Zones that would allow PA operations within these restricted areas on a

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<sup>22/</sup> See *FNPRM* ¶ 138.

<sup>23/</sup> See *id.* ¶ 140; see also T-Mobile *NPRM* Reply Comments at 9-10; Frank H. Sanders, *et al.*, *Effects of Radar Interference on LTE Base Station Receiver Performance*, at 44 (Dec. 2013) (reissued May 2014), available at <http://www.its.bldrdoc.gov/publications/2742.aspx> (noting that studies have been conducted on macrocell LTE deployments and suggesting that additional testing should be performed on microcell LTE base stations).

<sup>24/</sup> See Michael Cotton and Roger Dalke, *Spectrum Occupancy Measurements of the 3550-3650 Megahertz Maritime Radar Band Near San Diego, California*, at 1 (Jan. 2014), available at <http://www.its.bldrdoc.gov/publications/details.aspx?pub=2747>.

<sup>25/</sup> See, e.g., Qualcomm, *LTE Advanced in Unlicensed Spectrum* (last visited July 14, 2014), <http://www.qualcomm.com/solutions/wireless-networks/technologies/lte-unlicensed>; see also Arvind Padmanabhan, *LTE Small Cells in Unlicensed Spectrum* (June 12, 2014), available at <http://iedf.in/index.php/blog/item/lte-small-cells-in-unlicensed-spectrum> (noting that “LTE-U will ensure that resources are shared fairly. This way, Wi-Fi access points in the area will not be starved just because LTE-U is also operating in the same area”).

coordinated basis. As demonstrated in the AWS-3 proceeding and explained by NTIA’s Commerce Spectrum Management Advisory Committee Working Group 1, permissive use areas like Coordination Zones “potentially allow more use of the spectrum than Exclusion Zones.”<sup>26/</sup> In that proceeding, T-Mobile noted that Coordination Zones maximize the potential use of spectrum by, among other things, “providing a mechanism for operations within the Protection [or Coordination] Zone pursuant to coordination.”<sup>27/</sup> If the Commission nonetheless adopts its proposal to implement Exclusion Zones, it should not rely on NTIA’s initial analysis to determine their size. The FCC should further evaluate this issue and determine the appropriate size based on the contemplated uses of the 3.5 GHz Band and recent advances in technology.

#### **IV. PRIORITY ACCESS LICENSES SHOULD BE ISSUED USING A MORE TRADITIONAL STRUCTURE**

The FCC proposes to allow any entity eligible to hold an FCC license to apply for and hold a PAL.<sup>28/</sup> Consistent with PCAST recommendations, PALs would be authorized at the census tract level, but the FCC asks whether it should adopt alternative geographic license sizes and whether package bidding should be permitted.<sup>29/</sup> The Commission also proposes authorizing PALs over 10-megahertz unpaired channels, which would be dynamically assigned by the SAS.<sup>30/</sup> PALs would be available for one-year license terms with no renewal.<sup>31/</sup> While T-Mobile

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<sup>26/</sup> CSMAC, *Final Report: Working Group 1 – 1695-1710 MHz Meteorological-Satellite*, at 5 (July 23, 2013) (“*WG1 Final Report*”), available at [http://www.ntia.doc.gov/files/ntia/publications/wg1\\_report\\_07232013.pdf](http://www.ntia.doc.gov/files/ntia/publications/wg1_report_07232013.pdf); see also *Amendment of the Commission’s Rules with Regard to Commercial Operations in the 1695-1710 MHz, 1755-1780 MHz, and 2155-2180 MHz Bands*, Report and Order, GN Docket No. 13-185, FCC 14-31, ¶ 19 (rel. Mar. 31, 2014); *Amendment of the Commission’s Rules with Regard to Commercial Operations in the 1695-1710 MHz, 1755-1780 MHz, and 2155-2180 MHz Bands, et al.*, Notice of Proposed Rulemaking and Order on Reconsideration, 28 FCC Rcd. 11479, ¶ 15 (2013).

<sup>27/</sup> Comments of T-Mobile USA, Inc., GN Docket No. 13-185, *et al.*, at 9 (filed Sept. 18, 2013).

<sup>28/</sup> See *FNPRM* ¶ 42.

<sup>29/</sup> See *id.* ¶¶ 44-46.

<sup>30/</sup> See *id.* ¶¶ 47-48.

supports allowing broad access to the Priority Access tier, the FCC’s proposals for administering and licensing PALs should be revised to reflect more traditional licensing approaches.

**A. PAL Geographic Areas Should Be Larger Than Census Tracts.**

Contrary to the FCC’s claims, licensing PALs using census tracts does not represent a “middle ground” compromise.<sup>32/</sup> Instead, it represents a bias in favor of how spectrum is used on an unlicensed basis. The Commission’s proposal may be appropriate for spectrum used in a limited area on a “spot” basis. While that may be a fair assessment of how GAA users will employ the spectrum, it is fundamentally inconsistent with how carriers – or any licensed users – deploy spectrum. As T-Mobile has explained, many carriers may wish to secure access to 3.5 GHz Band spectrum throughout a market as part of a strategy to provide the type of coverage or capacity best satisfied by small cells.<sup>33/</sup> Carriers are not likely to implement that strategy on a census tract-by-census tract basis; that is not how carrier operations are structured. Requiring carriers to evaluate licenses based on over 74,000 census tracts in order to implement that strategy would also be unnecessarily burdensome and, because of the proposed limited duration of licenses, could create instability, making the band unattractive to carriers.<sup>34/</sup> Therefore, the Commission should license the 3.5 GHz Band using geographic areas no smaller than counties, which is more accurately a “middle ground” between census tracts and traditional license areas like Cellular Market Areas or Economic Areas.

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<sup>31/</sup> See *id.* ¶¶ 49-52.

<sup>32/</sup> See *id.* ¶ 46.

<sup>33/</sup> See T-Mobile *Public Notice* Comments at 6.

<sup>34/</sup> See T-Mobile *Public Notice* Reply Comments at 6-7.

## **B. PAL Frequency Assignments Should Be Fixed.**

PALs should also cover specific spectrum – not channels assigned dynamically by the SAS. Similar to the FCC’s proposed geographic area for PALs, the concept of dynamic use of spectrum is antithetical to the network planning in which carriers engage. Carriers carefully evaluate the channels they use in a particular place and time in order to optimize and make the most efficient use of their spectrum resources.<sup>35/</sup> Moreover, the 3.5 GHz Band may be used for various applications, including backhaul and small cell deployments that will be integrated into heterogeneous access networks. Allowing the SAS to dynamically change spectrum assignments would hinder licensees’ planning activities and impair their ability to manage integrated networks.<sup>36/</sup>

The FCC suggests that the SAS would be permitted to assign specific frequencies to PA licensees upon request, and, if a licensee has PALs in adjacent census tracts, the SAS should “endeavor” to assign contiguous frequencies across geographic boundaries.<sup>37/</sup> However, there is no guarantee that any request made by a PAL licensee would or could be honored by the SAS. The uncertainty created by this proposal would frustrate licensees’ spectrum management activities and deter investment in the 3.5 GHz Band by licensees, which will ultimately impact unlicensed operations. Carriers simply cannot cede such broad authority over spectrum management to a third party. As T-Mobile has suggested, the role of the SAS should be limited to identifying when spectrum is available for use by either PAL operators or GAA devices.<sup>38/</sup>

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<sup>35/</sup> See T-Mobile *Public Notice* Comments at 11; T-Mobile *Public Notice* Reply Comments at 10.

<sup>36/</sup> See T-Mobile *Public Notice* Reply Comments at 10-11.

<sup>37/</sup> See *FNPRM* ¶ 48.

<sup>38/</sup> See T-Mobile *Public Notice* Comments at 11.

### **C. PAL Terms Should Be Longer Than One Year.**

Finally, one-year licenses are too short. Licensees often need more than one year to invest in infrastructure and build out their spectrum.<sup>39/</sup> Like other components of the Commission's plan, a one-year term is appropriate for limited or opportunistic spectrum use, not management of a complex carrier network. While the Commission proposes to accept applications for PALs annually and to make up to five consecutive years of PALs available in any given window,<sup>40/</sup> the better approach would be for the FCC to issue exclusive PALs on a multi-year basis, similar to the 10-year licenses commonly issued in other wireless services.<sup>41/</sup> Moreover, PAL licensees should be afforded a renewal expectancy for the same channel block they are originally authorized in order to provide licensees with the regulatory certainty they need to innovate and invest in the 3.5 GHz Band.

### **V. THE TECHNICAL RULES MUST ACCOUNT FOR A VARIETY OF USE CASES**

The FCC proposes to allow CBSDs to operate only if authorized by the SAS and if they follow frequency assignment and power limitations set by the SAS.<sup>42/</sup> In order to accommodate a range of CBRS use cases, the Commission proposes to adopt, except for fixed point-to-point radio systems, a 24 dBm (per 10 megahertz) peak transmit power for CBSDs that are not operating in rural areas and a maximum aggregate EIRP of 30 dBm for devices with a 6 dBi antenna gain.<sup>43/</sup> For CBSDs operating in rural areas, the Commission proposes a 30 dBm (per 10 megahertz) peak transmit power and a maximum EIRP of 47 dBm for devices with a 17 dBi

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<sup>39/</sup> See T-Mobile *Public Notice Reply Comments* at 5-6.

<sup>40/</sup> See *FNPRM* ¶ 51.

<sup>41/</sup> See T-Mobile *Public Notice Reply Comments* at 5.

<sup>42/</sup> See *FNPRM* ¶ 65.

<sup>43/</sup> See *id.* ¶ 74.

antenna gain.<sup>44/</sup> In addition to proposing these power limits, the Commission seeks comment on whether it should require CBSDs to be interoperable across all frequencies from 3550-3700 MHz.<sup>45/</sup>

Because they are under the control of a network operator, PAL systems can be more easily identified and controlled than GAA devices. The Commission should therefore establish different power limits for each, permitting higher power levels for PAL licensees. Specifically, as T-Mobile previously suggested, the Commission should adopt a maximum transmit power of at least 37 dBm (5 watts) for PALs.<sup>46/</sup> While T-Mobile recognizes that authorizing too high of a power level may defeat the FCC’s goal of maximizing the 3.5 GHz Band for small cell use, the Commission’s proposal only accommodates one type of use – low-powered GAA devices. Moreover, the proposed power limitations would make the 3.5 GHz Band less capable than the 2.4 GHz or 5 GHz bands that are used for unlicensed operations. In order to ensure that the FCC fulfills its goal of “allow[ing] for a wide variety of innovative services to be deployed in the 3.5 GHz Band,”<sup>47/</sup> the Commission should consider developing technical rules and power limits that are more appropriate for additional contemplated applications of the band – *i.e.*, non-line-of-sight small cells and backhaul.<sup>48/</sup>

T-Mobile agrees that CBSDs should be interoperable across all frequencies from 3550-3700 MHz. Although the Commission should generally avoid technological mandates, it can and should support an interoperability requirement through the 3GPP process to ensure that devices are capable of operating across the entire band. As T-Mobile has explained in other

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<sup>44/</sup> See *id.*

<sup>45/</sup> See *id.* ¶ 64.

<sup>46/</sup> See T-Mobile *Public Notice* Comments at 13; T-Mobile *Public Notice* Reply Comments at 9-10.

<sup>47/</sup> *FNPRM* ¶ 74.

<sup>48/</sup> See T-Mobile *Public Notice* Comments at 13.

contexts, interoperability creates significant benefits including facilitating the provision of wireless broadband services to rural and other underserved areas, enhancing economies of scale in the handset market, and expanding roaming opportunities.<sup>49/</sup> The Commission need not require LTE devices, whether used in the GAA or PAL spectrum, to interoperate with equipment using other technologies. In particular, there is no need to mandate that unlicensed LTE equipment interoperate, for example, with unlicensed devices using the IEEE 802.11 suite of standards. Just as the Commission permits different mobile wireless platforms like Code Division Multiple Access, Time Division Multiple Access, and Global System for Mobile communications to co-exist, it should take the same approach here.<sup>50/</sup>

## **VI. THE SCOPE OF THE SPECTRUM ACCESS SYSTEM AND ITS INTERACTIONS WITH DEVICES SHOULD BE LIMITED**

The Commission proposes to establish the SAS using the Television White Space (“TVWS”) database as a model.<sup>51/</sup> Administrators would be allowed to collect “reasonable fees” from PA licensees and GAA users for use of the SAS and associated services.<sup>52/</sup> In addition, CBSDs would be required to provide the SAS with, among other things, information on their geographic location within  $\pm 50$  meters horizontal and  $\pm 3$  meters vertical and to report their location to the SAS within 60 seconds of a change in location exceeding the accuracy requirement.<sup>53/</sup> T-Mobile respectfully requests that the Commission re-evaluate these proposals, particularly as they pertain to PAL licensees.

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<sup>49/</sup> See Reply Comments of T-Mobile USA, Inc., GN Docket No. 13-185, *et al.*, at 21 (filed Oct. 28, 2013).

<sup>50/</sup> As noted above, LTE operations will be able to accommodate other technologies in the band.

<sup>51/</sup> See *FNPRM* ¶ 90.

<sup>52/</sup> See *id.* ¶ 109.

<sup>53/</sup> See *id.* ¶¶ 62-63.

**A. The SAS Should Not Be Permitted to Control a System's Operating Parameters.**

T-Mobile recognizes the efficacy of leveraging the FCC's previous experience in implementing the SAS. However, the SAS extends the TVWS concept into uncharted territory. The TVWS database effectively serves as a repository of information; it houses data on available channels and provides that information to TV band devices upon request.<sup>54/</sup> TV band devices are permitted to operate only after they receive the list of available channels and may only transmit on those available channels.<sup>55/</sup> The proposed SAS, on the other hand, would engage in affirmative system management. In addition to determining which frequencies CBSDs could operate on, the SAS would determine the maximum permissible radiated transmission power levels for CBSDs and enforce Exclusion Zones.<sup>56/</sup>

As noted above, SAS management of licensed spectrum is inconsistent with a carrier's ability to control its network. Licensees need flexibility to deploy various applications in the 3.5 GHz Band, each of which involve different power levels, interference protection criteria, and other technical parameters.<sup>57/</sup> These applications will not be known to the SAS (nor should they be) and thus should not be controlled by it.<sup>58/</sup> To hold otherwise would be to allow the SAS to dictate a licensee's operations, potentially hamstringing its system efficiency as well as stifling future innovation.<sup>59/</sup>

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<sup>54/</sup> See 47 C.F.R. § 15.713(a).

<sup>55/</sup> See *id.* § 15.713(e).

<sup>56/</sup> See *FNPRM* ¶ 95.

<sup>57/</sup> See T-Mobile *Public Notice* Comments at 11.

<sup>58/</sup> See T-Mobile *Public Notice* Reply Comments at 11-12.

<sup>59/</sup> See T-Mobile USA, Inc. Paper on the Proposed Spectrum Access System, GN Docket No. 12-354 (filed Jan. 3, 2014).

Unlicensed operations are different. Accordingly, SAS management of GAA devices, operating on unlicensed spectrum, would be appropriate.

**B. The SAS Should Not Be Permitted to Collect Fees from PAL Licensees.**

Fees should not be charged to PAL licensees. The Commission already proposes to assign PALs through auction,<sup>60/</sup> and PAL licensees would be required to pay for their use of the spectrum through that process. Although the TVWS database administrator is permitted to charge a fee to operators of TV band devices,<sup>61/</sup> those operators are not required to undergo an auction process in order to use the spectrum. If the Commission finds that it is necessary for the SAS to recover the costs associated with its services, such fees should be assessed only on GAA device users.

**C. The SAS Reporting Requirements are Impractical and Onerous.**

Finally, the Commission should re-evaluate its proposed geographic location reporting requirements. While today's devices could provide the SAS with information on their geographic location within  $\pm 50$  meters horizontal, they cannot provide geographic information to the SAS within  $\pm 3$  meters elevation with sufficient accuracy. The  $\pm 3$  meters elevation requirement is simply not consistent with current technology.<sup>62/</sup> Further, the FCC's proposal to require CBSDs to "re-check" and report their location every 60 seconds is unnecessarily burdensome. The Commission defines CBSDs as "fixed or portable base stations,"<sup>63/</sup> and such

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<sup>60/</sup> See *FNPRM* ¶¶ 118-134.

<sup>61/</sup> See 47 C.F.R. § 15.714.

<sup>62/</sup> See, e.g., T-Mobile USA, Inc. Comments on Third *FNPRM* on Location Accuracy, PS Docket No. 07-114, at 4 (filed May 12, 2014) (explaining that even if emerging technologies, such as barometric pressure sensors, are fully implemented, carriers would not be able to meet the FCC's proposed 3 meter vertical indoor location accuracy requirement as "studies indicate that it is highly unlikely that these sensors will be capable of providing accurate estimates of actual altitude, absent the placement of reference sensors in every multistory building").

<sup>63/</sup> See *FNPRM* at Appendix A.

stations are not likely to move often or quickly. Moreover, requiring CBSDs to continuously re-evaluate their location diverts resources from carriers' core operations, which can adversely affect traffic on their network. The Commission should avoid creating such an unnecessary data-gathering requirement.

## **VII. CONCLUSION**

T-Mobile continues to support the FCC's efforts to foster use of the 3.5 GHz Band by carriers and others to help meet their small cell and other needs. As the Commission adopts rules for the band, it is important that they maximize use of the spectrum for both licensed and unlicensed users. T-Mobile looks forward to working with the FCC on these important matters and, for the reasons discussed above, urges the Commission to carefully consider the proposals outlined herein.

Respectfully submitted,

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