

**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; Licensing Models and	)	
Technical Requirements in the	)	
3550-3650 MHz Band	)	

**REPLY COMMENTS OF AT&T**

AT&T Services Inc. ("AT&T") offers these reply comments in the proceeding captioned above.<sup>1</sup>

On November 1, 2013, the Commission released a Public Notice<sup>2</sup> soliciting further comment on specific alternative licensing proposals that commenters on the 3.5 GHz NPRM had suggested. In its comments on the PN, AT&T generally supported the Commission's tiered approach. AT&T noted that the proposed regime protects incumbent users while offering Priority Access and General Access users opportunities for a variety of innovative broadband services. While expressing overall support for the innovative licensing and management approach the Commission proposed for the 3550-3650 MHz band, AT&T observed that daunting technical and regulatory challenges lay ahead before the implementation of the FCC's plan can go forward. Most of the comments filed in response to the PN shared this view and offered sugges-

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<sup>1</sup> In December 2012, the Commission released a Notice of Proposed Rulemaking seeking comment on a new Citizens Broadband Service in the 3550-3650 MHz band (3.5 GHz Band) for shared, commercial uses, including small cell networks. *See* Amendment of the Commission's Rules with Regard to Commercial Operations in the 3550-3650 MHz Band, GN Docket No. 12-354, Notice of Proposed Rulemaking, 27 FCC Rcd 15594 (2012) ("NPRM or 3.5 GHz NPRM"). The NPRM proposed a three-tier framework intended to facilitate rapid broadband deployment while protecting existing incumbent users of the 3.5 GHz Band. *See* 3.5 GHz NPRM, 27 FCC Rcd at 15612-21, ¶¶ 53-77.

<sup>2</sup> Commission Seeks Comment on Licensing Models and Technical Requirements in the 3550-3650 MHz Band, Public Notice FCC 13-144 (November 1, 2013) ("PN").

tions aimed at smoothing the Revised Framework's<sup>3</sup> implementation. In short, these comments may be described as a "crawl-walk-run strategy," which many – including AT&T – view as the surest path to providing service in this band in the quickest amount of time with a minimum of problems.

**I. THE SPECTRUM ACCESS SYSTEM THAT THE FCC PROPOSES FOR THE 3.5 GHZ BAND IS A COMPLEX SYSTEM WHOSE DEPLOYMENT MUST PROCEED DELIBERATELY TO AVOID DELAYS IN LAUNCHING SERVICE IN THE BAND.**

The heart of the FCC's approach to providing and managing service in the band is the spectrum access system ("SAS").<sup>4</sup> Google has proposed an innovative SAS that, among other things, would enable the dynamic assignment of General Authorized Access ("GAA") operators to unused spectrum.<sup>5</sup> In addition, as proposed, Google's SAS would manage PAL spectrum auctions<sup>6</sup> and any potential interference among the incumbents, PALs, and GAA.<sup>7</sup> Essentially Google's SAS proposes a wide-ranging automated management system for the multi-tiered shared use of the 3.5 GHz band. AT&T congratulates Google for its innovative thinking about shared use of the 3.5 GHz spectrum. As wireless telecommunications continue to expand, it is this kind of thinking that can unlock greater portions of the radio spectrum for use in providing ever more complex communications solutions.

It is no overstatement to say that, no matter who creates the SAS, it will be the most sophisticated and complicated spectrum management system yet deployed by the FCC. Clearly, the deployment of so a complex system is fraught with potential missteps and hazards. This complexity is also heightened by the fact the database will contain the location and operating

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<sup>3</sup> PN at ¶ 2.

<sup>4</sup> Because this PN is focused mainly on licensing issues, AT&T expects that the FCC will provide further opportunities to comment on the SAS.

<sup>5</sup> PN Comments of Google at 13.

<sup>6</sup> AT&T expects that it will have an opportunity to comment in depth about auction procedures for this band.

<sup>7</sup> *Id.* at 5 and following.

characteristics of federal systems that are required for our national security. And recent events provide powerful evidence of the need to exercise caution when deploying complicated projects.<sup>8</sup> Consequently, AT&T urges the FCC to move deliberately and prudently in the implementation of this innovative, but very complex, technology. Mistakes or problems in the launch of SAS could delay the benefits expected to flow from the shared use of the 3.5 GHz band. While the Commission's upcoming workshop will reveal the state of the art of SAS systems, AT&T believes any order for SAS functionality would be premature until such systems have been fully tested in a production environment.

In its comments, Verizon proposed that

[T]he Commission [pursue] an incremental approach under which it dedicates part of the band to the ambitious Multi-Tier Framework, while also reserving some of the spectrum for a different regime (a “Transitional Framework”) that supports shorter-term deployment of existing technologies.<sup>9</sup>

Many commenters have described the complicated features they believe an SAS must have.<sup>10</sup> It is not reasonable to assume that the interrelated complexities and challenges of these SAS requirements can all be resolved at once. This implies that, without some transitional measure, exploitation of the 3.5 GHz band must await the development and thorough testing of the SAS. AT&T therefore recommends that the Commission consider creating a transitional phase along the lines proposed by Verizon. This would have the merit of beginning service in the band quickly for both PALs and GAA operators. At the same time, the development and vetting of the high-tech SAS can move forward in an atmosphere devoid of crisis.

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<sup>8</sup> See, e.g., D.C. Streetcars Begin Slow Testing Process On H Street, available at [http://wamu.org/news/13/12/16/dc\\_streetcars\\_begin\\_slow\\_testing\\_process\\_on\\_h\\_street](http://wamu.org/news/13/12/16/dc_streetcars_begin_slow_testing_process_on_h_street).

<sup>9</sup> PN Comments of Verizon at 2.

<sup>10</sup> See, e.g., PN Comments of Motorola Solutions, Inc. at 2 and the Wireless Internet Service Providers Association at 18.

It is clear that the SAS will have access to an enormous amount of operator, consumer, and device data to manage spectrum use in the band. The scope and depth of the data collection necessarily gives rise to concerns about the safety and proper use of the data. In establishing the SAS, the Commission must set requirements that will ensure the protection of these data from misuse. The Commission should declare in unambiguous terms that spectrum assignment is an FCC function no matter who is assigned to manage the task as the FCC's agent. If such an assignment were to be made, as seems likely – and even desirable – in this instance, then the FCC must declare further that all data associated with or arising from the operation of the SAS belongs to the FCC and no other party, and that the data can be used for no other purpose. FCC ownership of the data arising from the SAS will provide an important measure of comfort to carriers, incumbent federal users, and customers using the multi-tiered shared platform this proceeding intends to create. Indeed, the FCC should propose specific rules governing the legitimate use of these data backed by meaningful penalties for their violation. Moreover, the FCC should contract with a vendor qualified and approved by the DoD, NTIA and the GSA to develop the SAS as a “work made for hire.” In this way, the FCC would own the SAS and have undisputed control over the operation of the system and its data.

The Commission's SAS proposal envisions dynamic frequency assignment of unpaired 10 MHz channels.<sup>11</sup> AT&T believes that PALs should be granted fixed spectrum assignments, rather than dynamically assigned spectrum and that the interaction of PALs with the SAS will be primarily for registration purposes, not the assignment of licenses. Like AT&T, some other

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<sup>11</sup> In its PN comments, AT&T agreed that dynamic assignment of GAA devices to unused PAL spectrum should be permitted so long as the PAL spectrum in question is not assigned to a PA licensee. Once assigned, the SAS must block use of that spectrum by a GAA device. Obviously, the SAS must be capable of performing this action if dynamic use of unlicensed PAL spectrum is to be opportunistically used by GAA. As suggested by Verizon, AT&T agrees that during the transition phase, GAA should operate only in the block of frequencies set aside for its use.

commenters<sup>12</sup> have expressed support for assigned, rather than dynamic, spectrum rights, noting the complexity that dynamic assignment of PALs creates for the SAS, operator networks, and the consumer devices themselves. The benefits of dynamic spectrum assignment for PALs remain unclear; but, one can reasonably conclude that it will certainly add to the complexity of what is already an innovative and highly complicated licensing scheme. Moreover, dynamic assignments, even if they are possible, would make delivery of high-bandwidth mobile broadband more complex and costly. For example, in a mobile broadband environment, where robust hand-off capabilities are expected, dynamic frequency assignments would require that all surrounding nodes also reconfigure dynamically to account for the changes to allow continued interaction between the devices. Doing this on a dynamic basis drives up the complexity which will significantly add to the cost of maintaining this robust environment.

**II. AT&T SUPPORTS THE REVISED FRAMEWORK’S INNOVATIVE APPROACH TO SHARING SPECTRUM IN THE 3.5 GHZ. TO HELP ACHIEVE THAT GOAL, AT&T OFFERS SOME SUGGESTIONS TO SPUR INVESTMENT IN THE BAND.**

**a. PALs SHOULD HAVE A LONGER TERM AND A RENEWAL EXPECTANCY COUPLED TO BUILD-OUT REQUIREMENTS.**

The Commission has proposed issuing one-year, non-renewable licenses for the PALs.<sup>13</sup> The FCC’s proposal does, however, permit licensees to aggregate multiple consecutive PALs to obtain multi-year rights to spectrum within a given geographic area<sup>14</sup> up to a predetermined cap.<sup>15</sup> Most commenters<sup>16</sup> oppose the one-year, non-renewable proposal because of the uncertainty the proposal creates for investment in the block. Unless a carrier’s application for successive licenses is unopposed, it cannot be certain that it will enough time to construct and operate a

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<sup>12</sup> PN Comments of T-Mobile at 3; PN Comments of Verizon at 3;

<sup>13</sup> PN at ¶ 13.

<sup>14</sup> *Ibid.*

<sup>15</sup> PN at ¶ 22. The FCC has not proposed a specific cap.

<sup>16</sup> PN Comments of T-Mobile at 6; PN Comments of Qualcomm at 3; PN Comments of Nokia Solutions at 4;

network profitably. Investors need greater certainty that they can earn a fair return on their investment and that the investment itself will not later be stranded for want of successor licenses. Moreover, customers, like commercial entities, such as large retailers seeking in-building coverage, also need assurance that they will have continuity of service without the need to find a service vendor every year or two.

While there is consensus that a one-year, non-renewable license is insufficient assurance to spark investment in the band, there is no agreement among commenters as to what the proper term for PALs should be. AT&T believes that an approach akin to that suggested by Google could provide investors and customers with the incentive to begin exploiting the band.<sup>17</sup>

Importantly, whatever the license term, be it a two-year term as proposed by Google, a one year term as proposed by the FCC, or something greater, the Commission must allow for the aggregation of multi-year licenses with some level of renewal expectancy if the PA licensee has met the construction and use requirements established for the licensed areas. AT&T believes that this arrangement will encourage investment in the 3.5GHz band and result in quicker exploitation of the band. It will also discourage “warehousing” of spectrum.

**b. CENSUS TRACTS ARE NOT WELL SUITED AS THE GEOGRAPHIC AREA FOR PALs.**

The Commission proposed offering the PALs on a “census tract<sup>18</sup>” basis. As Google has noted, census tract boundaries tend to run down the center of streets, potentially making frequen-

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<sup>17</sup> “Google believes the Commission can better achieve each of these goals by issuing licenses with a renewal expectancy limited to those portions of the spectrum that the licensee actually uses, as recorded in an SAS.” Google PN Comments at 8. Google also proposes a two-year term for the PALs. *Id.* at 9.

<sup>18</sup> “Census Tracts are small, relatively permanent statistical subdivisions of a county or equivalent entity that are updated by local participants prior to each decennial census as part of the Census Bureau's Participant Statistical Areas Program...Census tracts generally have a population size between 1,200 and 8,000 people, with an optimum size of 4,000 people.” Available at [http://www.census.gov/geo/reference/gtc/gtc\\_ct.html](http://www.census.gov/geo/reference/gtc/gtc_ct.html).

cy coordination difficult.<sup>19</sup> A number of carriers, notably T-Mobile and Verizon<sup>20</sup>, have also noted that coordination of small cell site locations and management of border area interference between different licensed service providers will be difficult at best.<sup>21</sup> In the light of these issues, Verizon, T-Mobile and others suggest larger licensed service areas.<sup>22</sup> AT&T believes that a more rapid deployment of service in the 3.5 GHz band will occur if, during the transitional period, the initial licensed service areas for PALs are larger than census tracts. As more experience is gained with the 3.5 GHz band and small cell deployment, the Commission could then revise licensing rules. In AT&T's view, rolling out licensed service in the 3.5 GHz band at the granular level of census tracts risks stalling development in the band.

### **III. MORE ATTENTION SHOULD BE GIVEN TO THE PROBLEM OF POTENTIAL GAA INTERFERENCE.**

GAA use of the spectrum<sup>23</sup> offers an opportunity for the development of new services. It is in the GAA part of the 3.5 GHz band that the SAS may prove the feasibility of dynamic spectrum assignment. These opportunities do come with some risk because the GAA devices could cause harmful interference to the PALs. Preliminarily, AT&T thinks it is important that the SAS must lock out any GAA device that has not registered on the system. In this way, bootleg devices cannot interfere with the lawful use of incumbents, PALs, and GAA operators.

Verizon observed that many of the air interfaces that could be used in the Revised Framework (e.g., WiFi, point-to-point backhaul) do not have centralized control features and that

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<sup>19</sup> See, e.g., Census tract map of midtown Manhattan showing the census tract boundaries following the street grid of the city. Available at [http://www2.census.gov/geo/maps/dc10map/tract/st36\\_ny/c36061\\_new\\_york/DC10CT\\_C36061\\_002.pdf](http://www2.census.gov/geo/maps/dc10map/tract/st36_ny/c36061_new_york/DC10CT_C36061_002.pdf).

<sup>20</sup> See PN Comments of T-Mobile at 3 and of Verizon at 7.

<sup>21</sup> There are 74,000 census tracts. Even assuming that carriers may aggregate some number of them into larger areas, the coordination of border areas and small cell site locations remains a daunting task.

<sup>22</sup> Google proposes a spectrum propagation model, Google PN Comments at 5; T-Mobile proposes county by county licensing, T-Mobile PN Comments at 3; while both Verizon and Qualcomm argue that larger licensed service areas are necessary if service in the band is to roll out quickly. PN comments of Verizon at 3 and of Qualcomm at 3.

<sup>23</sup> As noted earlier in n. 10, AT&T supports, subject to the conditions described, the dynamic assignment of GAA to unlicensed PAL spectrum.

the risk of rogue use of channels by means of hacking the local micro-processor is well documented.<sup>24</sup> To combat this threat, Verizon would require GAA devices with hardware capable of emitting on channels where PALs operate to have features that ensure they are not hacked in ways that would permit them to emit on those frequencies. In addition, the identity of the GAA user making a request for spectrum allocation must be secure.<sup>25</sup> AT&T supports these recommendations.

Another problem touches upon the security of the GAA access point.<sup>26</sup> If the location of the GAA access point is inaccurately reported to the SAS, whether accidentally or deliberately, the potential for harmful interference to other users is greatly increased. Hence, the GAA access point must report its valid location for interference purposes. That location report must be based on an internal GPS within the access point, in order to determine its own location accurately. The location report to the SAS must also be secure and, therefore, must be encrypted to avoid the possibility of spoofing an incorrect location. To the extent the GAA device is used indoors where no GPS signal is available, protocols will need to be developed so that accurate location information is provided to the SAS.

AT&T proposed allowing opportunistic use of PAL spectrum by GAA on the condition that the Commission ensure that GAA users cannot access PAL spectrum once a PAL registers deployment in the band.<sup>27</sup> In no circumstance could there be GAA operations on PAL frequencies that are deployed. Other commenters have taken different approaches to this issue, but all aim to solve the same problem, which is the potential for GAA interference resulting from dy-

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<sup>24</sup> PN Comments of Verizon at 5.

<sup>25</sup> *Id.* at 5-6.

<sup>26</sup> *Ibid.*

<sup>27</sup> As noted earlier, this supposes that the SAS is functioning well enough to perform this operation. During the transition phase, GAA should be confined to the spectrum set aside for its use as Verizon proposes. Once the SAS operates reliably, the dynamic assignment of GAA to unlicensed PAL channels can move ahead.

namic spectrum assignment by the SAS. AT&T encourages the Commission to give this issue serious consideration because of its potential effect on the stability of the shared use plan for 3.5 GHz and, ultimately, the willingness of entities to invest in this band.

### CONCLUSION

AT&T supports the FCC's innovative and creative proposals for sharing the 3.5 GHz band. In general, AT&T regards the Revised Framework as a good starting point for flexible and efficient use of this band. To assure a smooth and prompt roll-out of service, AT&T has proposed some changes to the Revised Framework. These suggestions are aimed making certain that the complex operations of the SAS are fully functional before entrusting management of the band to it. As such, AT&T agrees with Verizon that the Commission should establish a transition phase during which the potential for interference from GAA devices is mitigated by confining their operation to a block reserved temporarily for their use. AT&T also urges the Commission to reconsider to its position that PALs should be non-renewable with no renewal expectancy. Finally, AT&T recommends that the PALs be given specific frequency assignments.

Respectfully submitted,

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