

**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)	

To: The Commission

**REPLY COMMENTS OF
OPEN TECHNOLOGY INSTITUTE AT NEW AMERICA
AND PUBLIC KNOWLEDGE**

The Open Technology Institute at New America (“OTI”) and Public Knowledge (“PK”) – are pleased to submit these Reply Comments in response to parties filing comments concerning the Second Further Notice of Proposed Rulemaking (“*Second FNPRM*”) adopted by the Federal Communications Commission (“Commission”) on April 17, 2015.¹

I. INTRODUCTION AND SUMMARY

OTI and PK continue to strongly support the Commission’s conclusion in the *Report & Order* that “Priority Access Licensees should not be permitted to exclude other authorized users unless and until their networks are in use.”² OTI and PK are pleased to concur with the diverse and overwhelming majority of parties filing comments that support an engineering definition of actual “use” and the general view that protection areas can be determined and enforced objectively by the Spectrum Access System (SAS).

¹ *Amendment of the Commission’s Rules with Regard to Commercial Operations in the 3550-3650 MHz Band*, Report and Order and Second Further Notice of Proposed Rulemaking, GN Docket No. 12-354, 30 FCC Rcd 3959 (rel. Apr. 21, 2015) (“*Report and Order*” or “*Second FNPRM*”).

² *Report & Order* at 25 (¶ 73).

In our initial comments, OTI and PK proposed that the Commission can best advance its goal to “ensure that the band will be in consistent and productive use”³ by defining actual “use” along two dimensions: *geography and time*. The Commission has the opportunity to leverage the capability of the SAS – using information reported to the SAS under the rules already adopted – to dynamically determine *where* and *when* the licensed spectrum is in actual use and what protection contour will ensure non-interference.

There is now strong support in the record for the view that the Commission can best promote consistency, accountability and spectrum efficiency by requiring that the neutral SAS administrators certified by the agency make this calculation by applying a standardized algorithm to the geolocation and basic operational parameters that are reported for each CBSD as part of the required registration process. Priority Access License (“PAL”) holders are required under the rules adopted in the *Report & Order* to report the basic operational characteristics of each and every Citizens Broadband Radio Service Device (“CBSD”) to the SAS at the time the CBSD is registered, and to immediately update the SAS if any parameter changes. Similarly, the CBSDs regularly contact the SAS and provide (or could provide) basic information on whether they are actively transmitting. Allowing the SAS to calculate the protection areas is consistent, objective and also imposes no added reporting “burden” on PAL operators.

³ *Id.* at ¶ 72.

II. THE RECORD STRONGLY SUPPORTS AN ENGINEERING DEFINITION OF ACTUAL “USE” THAT REQUIRES THE SPECTRUM ACCESS SYSTEM TO CALCULATE PROTECTION AREAS CONSISTENTLY AND OBJECTIVELY

A diverse and overwhelming majority of parties filing comments support an engineering definition of actual “use,” as well as the general view that protection areas can be determined and enforced objectively by the Spectrum Access System (SAS).⁴ The opposing view, which would permit PAL holders to exclude opportunistic access to substantial amounts of fallow spectrum, is predictably confined to the two dominant cellular carriers (AT&T and Verizon),⁵ their trade association (CTIA),⁶ and the cellular industry’s dominant chip vendor (Qualcomm).⁷ A number of commenters also joined OTI and PK in explicitly opposing the idea – apparently supported only by Verizon – that “use” should be defined to permit licensees to exclude GAA users from completely fallow spectrum covering all or a portion of a PAL area if the licensee designates it a “guard band.”⁸

⁴ See Comments of InterDigital, Inc., GN Docket No. 12-354 (filed July 15, 2015), at 3-4; Comments of the Dynamic Spectrum Alliance, GN Docket No. 12-354 (filed July 15, 2015), at 2-3; Comments of Sony Electronics Inc., GN Docket No. 12-354 (filed July 15, 2015), at 1-2; Comments of Federated Wireless, Inc., GN Docket No. 12-354 (filed July 15, 2015) (“Federated Wireless Comments”), at 6-7; Comments of Microsoft Corporation, GN Docket No. 12-354 (filed July 15, 2015) (“Microsoft Comments”), at 2-5; Comments of the Wireless Internet Service Providers Association, GN Docket No. 12-354 (filed July 15, 2015) (“WISPA Comments”), at 2-7; Comments of the Wi-Fi Alliance, GN Docket No. 12-354 (filed July 15, 2015) (“Wi-Fi Alliance Comments”), at 3-4; Comments of Google, Inc., GN Docket No. 12-354 (filed July 15, 2015), at 2 *et seq.*; Comments of Jon Peha, GN Docket No. 12-354 (filed July 15, 2015), at 1, 6; Comments of the Open Technology Institute and Public Knowledge, GN Docket No. 12-354 (filed July 15, 2015) (“OTI/PK Comments”), at 3-8.

⁵ Comments of AT&T, GN Docket No. 12-354 (filed July 15, 2015) (“AT&T Comments”), at 3; Comments of Verizon, GN Docket No. 12-354 (filed July 15, 2015) (“Verizon Comments”), at 1-2.

⁶ Comments of CTIA – The Wireless Association, GN Docket No. 12-354 (filed July 15, 2015) (“CTIA Comments”) at 8.

⁷ Comments of Qualcomm Incorporated, GN Docket No. 12-354 (filed July 15, 2015) (“Qualcomm Comments”), at 2-3.

⁸ See Wi-Fi Alliance Comments at 3; Microsoft Comments at 5; WISPA Comments at 6. “Maintaining fallow PAL spectrum as a guard band inside a PAL area is also unnecessary under the rules adopted in the *Report and Order*. The SAS is already required to authorize requested GAA operations on unused

As a general matter, OTI and PK strongly support Microsoft's view that the Commission's definition of "use" should be "engineering-based and one that promotes maximum opportunistic access in the 3.5 GHz band, where the Spectrum Access System plays the central role."⁹ Similarly, Google states that "[a]n engineering definition based on actual deployment conditions will maximize availability for [GAA] users while protecting [PAL] holders and can accommodate secondary transactions."¹⁰ As our groups and the Public Interest Spectrum Coalition (PISC) have stated in previous filings, a granular "use it or share it" rule implemented objectively by the SAS is the closest thing imaginable to a spectrum 'free lunch'.

Accordingly, the record shows strong support for an engineering definition of actual "use," which as stated by the *Report and Order*, would "effectively leverag[es] the SAS to define a boundary that would forbid GAA access near Priority Access CBSDs."¹¹ The Commission can best promote consistency, accountability and spectrum efficiency by requiring that the neutral, agency-certified SAS administrators make this calculation by applying a standardized algorithm to the geolocation and basic operational parameters that are reported for each CBSD as part of the required registration process.

OTI and PK agree with WISPA, Federated Wireless, Microsoft and other commenters who propose that the SAS determine *where* within a census tract GAA use will be permitted. The coverage area where the PAL's operations would require protection should be calculated by applying objective algorithms to the geolocation and operational data (EIRP, antenna gain and

spectrum in a PAL area only to the extent this would not cause harmful interference with actual PAL operations, as discussed just above." Comments of OTI/PK at 8.

⁹ Microsoft Comments at 2.

¹⁰ Google Comments at 1.

¹¹ *Report and Order* at ¶ 419.

pattern, etc.) provided to the SAS by each CBSD.¹² OTI and PK concur with Federated Wireless that “the SASs, using data provided by the PAL licensee, could define a protection boundary, or protected service contour, around active PAL CBSDs.”¹³

As Microsoft suggests, “the specific details, including any algorithms,” could be developed on a consensus basis, if possible, through the Multi-Stakeholder Group.¹⁴ But with respect to the basic governance of this historic, three-tier spectrum sharing system, OTI and PK strongly agree that “[t]he Commission is best served by employing an engineering-based definition of use, where the SAS plays the central role.”¹⁵

With respect to *when* PAL spectrum should be considered in “use,” several parties joined OTI and PK in proposing a definition of “use” based on actual transmission, and not solely based on calculated protection contours (the polygon approach). As Verizon candidly observes, an ISP may want to hold PAL spectrum “as a reserve channel for occasional periods of peak demand,”¹⁶ leaving the public resource unused a majority of the time. Wasting PAL spectrum capacity in this manner is antithetical to the stated purposes of the three-tier Citizens Broadband Radio Service and unjustifiable in light of the SAS’s ability to more efficiently manage access without imposing a risk of harmful interference on licensees.

Notably, Wi-Fi Alliance asserts that “[u]nless there is a current report that radiofrequency (RF) energy is being actively transmitted or received on PAL channels, those channels should be

¹² WISPA Comments at 2-3; Microsoft Comments at 3; Federated Wireless Comments at 4-5. *See* 47 C.F.R. § 96.39(c).

¹³ Federated Wireless Comments at 4-5.

¹⁴ Microsoft Comments at 3.

¹⁵ *Ibid.*

¹⁶ Verizon Comments at 2.

available for GAA use.”¹⁷ OTI and PK support this basic principal, which is also consistent with WISPA’s specific proposal and observation that “[a] CBSD that is exchanging actual end-user data packets with one or more customer end-user devices . . . or one other CBSD . . . is the best example of actual ‘use,’” and one that the PAL can easily track.¹⁸

The two dominant mobile carriers and their trade association stake out alternative positions for which there is little support in the record. CTIA and Qualcomm assert in essence that the Commission should leave the definition of “use” to each individual licensee to define for itself,¹⁹ an argument that would be more appropriately made in a petition for reconsideration. CTIA suggests that the Commission should define “use” to mean “when a Priority Access Licensee provides notification that it intends to transmit on its PAL spectrum, including for pre-deployment testing.”²⁰ AT&T somewhat more modestly proposes that PAL spectrum should be deemed in use “once the PAL begins to offer service in a Census Tract,”²¹ while Verizon doesn’t actually specify when the exclusion of GAA users would begin. All four of these parties propose that once any portion of a PAL area is “in use,” then GAA users should be excluded from the entire PAL area, even if there is no transmission or reception of service in certain areas.²²

OTI and PK acknowledged in our initial comments that PAL holders should be protected during periods of “actual use” that occur prior to the commencement of actual commercial operation. For example, a PAL holder will typically conduct pre-operational testing, or might decide in certain locations to use the spectrum for a purpose that does not operate 24/7 (e.g., for

¹⁷ Wi-Fi Alliance Comments at 3. “Specifically, the Commission’s understanding of the ‘use’ of PAL spectrum should center on the transmission or reception of radio frequency energy.” *Id.* at 2.

¹⁸ WISPA Comments at 4; *see also InterDigital Comments* at 3.

¹⁹ Comments of CTIA at 4; Comments of Qualcomm at 3.

²⁰ Comments of CTIA at 4.

²¹ Comments of AT&T at 2.

²² CTIA proposes “a framework where notice of commencement of operations in any part of a licensed census tract triggers the cessation of GAA operations through a census tract . . .” CTIA Comments at 6.

point-to-point backhaul during business hours, or for network offload during peak hours). In all of these situations – and many others we cannot foresee – the PAL spectrum normally used by a deployed and registered CBSD may not be in “actual use” for substantial periods of time. These are all scenarios that reinforce the need for excluding GAA users only when and where the Priority Access Licensee is *actually operating*. They are not a good reason to leave spectrum fallow based on an arbitrary or self-defined notification that the entire PAL is “in use.”

The cellular industry proposal would also create a moral hazard, since licensees will have a strong economic incentive to run a drive-by test or turn on a base station, simply in order to block Wireless Internet Service Providers (WISPs) and any other opportunistic public access to otherwise unused spectrum capacity., OTI and PK agree with Microsoft that licensees have “an economic incentive to engage in such ‘license saving’ (or ‘spectrum warehousing’) because it would crowd out competing GAA products, thereby forcing consumers to pay monthly fees for licensed access.”²³

OTI and PK believe that if the Commission does not adopt a definition of “use” that permits opportunistic access by GAA users during periods when the PAL holder is not transmitting, then it should at least require PAL operators to affirmatively notify the SAS (perhaps through a simple online web portal) when its actual operations need to preclude opportunistic GAA use of bandwidth in a specified area, and when that CBSD ceases operation for any extended period (e.g., longer than 24 hours). The Commission should allow PA Licensees to notify the SAS in advance that they will need to occupy the channel for testing or other purposes on a particular date (or range of dates), but without permitting such notification to preclude opportunistic GAA access indefinitely. In this respect, it is imperative that the

²³ Comments of Microsoft at 3-4.

Commission clearly defines “actual use” such that PAL holders are not able to use pre-deployment testing, or any other temporary or periodic use, to permanently foreclose opportunistic and non-harmful GAA access to unused spectrum.

The mobile industry commenters also propose that once any portion of a PAL area is “in use,” then GAA users should be excluded from the entire PAL area, even if there is no transmission or reception of service in certain areas.²⁴ OTI and PK certainly acknowledge that there will be dense urban census tracts where the licensee’s initial deployment will immediately and fully foreclose GAA users. However, requiring the SAS to manage GAA use of the unused portions of other PAL areas is particularly important because the Commission decided to adopt census tracts (many of which cover hundreds of square miles or more) as the basis for licensing this small cell band. This new service should not be conceived as if it will be strictly a wide-area mobile carrier band. It is both likely and desirable that PALs will be acquired to provide services with a very limited geographic scope, such as a particular office park, campus, cluster of buildings, or even a small neighborhood or town that represents only a fraction of the total license area. In those situations, much of the bandwidth on that 10 MHz channel could be wasted if the SAS is not authorized to allow at least GAA use in a manner that won’t impose harmful interference on the licensed operation.

Finally, OTI and PK strongly disagree with Verizon’s proposal that the PAL should be given the discretion to “define their service area and report it directly to the SAS.” Verizon not only opposes a central role for the FCC-certified SAS in defining the protection zones, it also proposes that the Commission “establish a rebuttable presumption that the contours certified by

²⁴ CTIA proposes “a framework where notice of commencement of operations in any part of a licensed census tract triggers the cessation of GAA operations through a census tract . . .” CTIA Comments at 6.

each PAL holder are valid.”²⁵ As justification, Verizon states that “a third party [the SAS] cannot know what protections an operator needs, including if it is using spectrum as a guard band or as a reserve channel for occasional periods of peak demand.”²⁶

As noted above, OTI, PK and a number of other commenters addressing this issue support a central role for the SAS in calculating the protected “service contours” precisely because Priority Access Licensees will have a strong incentive to do what Verizon proposes: to self-define “protection zones” that promote their immediate business interest but which could be wildly inconsistent and contrary to the Commission’s stated intention to “permit[] opportunistic access to unused Priority Access channels [that] would maximize the flexibility and utility of the 3.5 GHz Band for the widest range of potential users” and “ensure that the band will be in consistent and productive use.”²⁷

Reserving fallow spectrum as a guard band inside a PAL area is also unnecessary under the rules adopted in the *Report and Order*. The SAS is already required to authorize requested GAA operations on PAL spectrum only to the extent that this would not cause harmful interference with actual PAL operations.

The Commission can best promote consistency, accountability and spectrum efficiency by requiring that the neutral SAS administrators certified by the agency make this calculation by applying a standardized algorithm to the geolocation and basic operational parameters that are reported for each CBSD as part of the required registration process. As OTI and PK detailed in our initial comments, the location and basic operational characteristics of each and every CBSD needed to make the calculation (e.g., accurate geolocation, conducted power levels,

²⁵ Verizon Comments at 2-3.

²⁶ *Id.* at 2.

²⁷ *Report & Order* at ¶ 72.

height above average terrain, antenna type) is already required to be reported to the SAS as part of the CBSD registration process – and updated if there is any change (e.g., location or EIRP).²⁸

CONCLUSION

OTI and PK once again commend the Commission for its creative and diligent effort to define and authorize this historic new Citizens Broadband Radio Service based on a three-tier model of dynamic spectrum access. Accordingly, the Commission should take advantage of the capabilities of the SAS and require that the PAL protection areas (*where*) and active usage (*when*) are each consistently and objectively determined on a dynamic basis by the SAS.

Allowing the SAS to calculate and enforce the protection areas is consistent, objective and also imposes no added reporting “burden” on PAL operators.

Respectfully Submitted,

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²⁸ The *Report and Order* “require[s] that as part of registration, the CBSD should provide the SAS with a number of operational parameters, including geographic location, antenna height above ground level (meters), CBSD operational category (Category A/Category B), requested authorization status, unique FCC identification number, user contact information, air interface technology, unique serial number, and additional information on its deployment profile (e.g., indoor/outdoor operation).” *Report & Order* at 4032 ¶ 232; § 96.39(c). The rules adopted in the *Report and Order* require additional technical specifications at registration for Category B CBSDs, including “antenna gain, antenna beam width, antenna azimuth for sector site, and antenna height above ground level.” *Id.* at 4032 ¶ 233; § 96.45(d).