

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

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| 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 |) | |
| |) | |
| Commission Seeks Comment on Licensing |) | FCC 13–144 |
| Models and Technical Requirements in the 3550– |) | |
| 3650 MHz Band |) | |
| |) | |
| To: The Commission | | |

CTIA REPLY COMMENTS TO 3.5 GHz PN

CTIA–The Wireless Association[®] (“CTIA”) commends the Commission for seeking input on the proposed Revised Framework and further refining the spectrum access regime to enable access to the 3.5 GHz band.¹ These reply comments identify several threshold issues raised in the initial round of comments that are critical to prompt investment and innovation in the 3.5 GHz band, including:

- The optimal approach in the 3.5 GHz band is a two-tier spectrum access regime with incumbent operations and otherwise exclusive-use licenses. If the Commission decides to adopt a three-tier structure in the 3.5 GHz band, it can best foster investment and innovation by making further revisions to the Priority Access License (“PALs”) approach and taking active steps to ensure interference protection from General Authorized Access (“GAA”) devices.
- The Revised Framework shows promise but needs further refinement to trigger investment, including a PALs licensing regime with multi-year licenses, renewal expectancy, and performance requirements; PALs also should be licensed over larger geographic areas than census tracts.
- The wireless industry has offered multiple solutions to address the risk of GAA interference that threatens to undermine PALs investment and deployment. Options include differentiated GAA spectrum; GAA use of PALs spectrum if GAA users cannot

¹ Public Notice, *Commission Seeks Comment on Licensing Models and Technical Requirements in the 3550-3650 MHz Band*, FCC 13–144 (Nov. 1, 2013) (“Public Notice”).

access PAL spectrum once a PAL licensee registers deployment and operations begin; and a transition framework with two-tier access while work continues on GAA issues.

I. INTRODUCTION

As CTIA has explained, with the demand for mobile broadband skyrocketing, the Commission must continue to work with NTIA to prioritize making additional spectrum available below 3 GHz for reallocation to exclusive non-Federal use,² as directed by the Spectrum Act,³ and as identified in the National Broadband Plan,⁴ the President's National Wireless Initiative,⁵ and the Presidential Memorandum on Unleashing the Wireless Broadband Revolution.⁶ At the same time, in the 3.5 GHz band where the government seeks to repurpose new spectrum for commercial broadband but incumbents cannot be fully relocated, CTIA is eager to work with the FCC to optimize spectrum access for mobile broadband.

CTIA members strongly support repurposing the 3.5 GHz band. The 3.5 GHz spectrum holds great promise for small cell deployment, which can serve as part of the network capacity solution to the growing demand for mobile broadband while promoting innovations in deployment and spectrum management. In addition, 3.5 GHz also may be used to backhaul growing mobile broadband traffic from cell sites to the network.

² See, e.g., Comments of CTIA, GN Docket No. 12-354 (filed Feb. 20, 2013).

³ See Middle Class Tax Relief and Job Creation Act of 2012, Pub. L. No. 112-96, 126 Stat. 156, § 6701(a)(3) ("Spectrum Act"), codified at 47 U.S.C. 923(j) (directing NTIA, when evaluating potential bands for reallocation to non-Federal use, to "give priority to options involving reallocation of the band for *exclusive* non-Federal use") (emphasis added).

⁴ See Federal Communications Commission, CONNECTING AMERICA: THE NATIONAL BROADBAND PLAN, at 84 & Exh. 5-E (Mar. 16, 2010) ("NBP").

⁵ See The White House, Fact Sheet: President Obama's Plan to Win the Future through the Wireless Innovation and Infrastructure Initiative (Feb. 10, 2011), *available at* <http://www.whitehouse.gov/the-press-office/2011/02/10/president-obama-details-plan-win-future-through-expanded-wireless-access>.

⁶ See The White House, Presidential Memorandum: Unleashing the Wireless Broadband Revolution, Memorandum For The Heads Of Executive Departments And Agencies (June 28, 2010) *available at* <http://www.whitehouse.gov/the-press-office/presidential-memorandum-unleashing-wireless-broadband-revolution>.

CTIA continues to believe, in the first instance, that the optimal approach in the 3.5 GHz band is a two-tier spectrum access regime with incumbent operations and otherwise exclusive-use licenses that will generate prompt investment and innovation in the band. If the Commission decides to adopt a three-tier structure in the 3.5 GHz band, it can best foster investment and innovation by making further revisions to the PALs approach and taking active steps to ensure interference protection from GAA devices.

II. CTIA COMMENDS THE COMMISSION’S OPEN ELIGIBILITY PROPOSAL FOR PRIORITY ACCESS

As an initial matter, CTIA joins the commenters who widely support the Revised Framework’s proposal to permit any prospective licensee with basic qualifications to apply for a Priority Access License.⁷

This approach will enable a multitude of interested stakeholders to gain access to licensed spectrum with assured rights of use and interference protection – including commercial mobile broadband providers intent on expanding capacity and providing robust mobile broadband to their customers. Open eligibility will promote competition in the mobile broadband market and allow innovation and investment to flourish in the 3.5 GHz band. As Alcatel-Lucent observes, “*any class of user that demands access to spectrum with guaranteed quality of service, high reliability and availability should be eligible to obtain such access.*”⁸

⁷ See Comments of AT&T at 3; Comments of Alcatel-Lucent at 1-2; Comments of BLiNQ Networks at 5; Comments of Consumer Electronics Association at 1-3; Comments of Google at 5; Comments of Nokia Solutions and Networks at 4; Comments of Open Technology Institute at New America Foundation and Public Knowledge at 16; Comments of PCIA and HetNet Forum at 3; Comments of Qualcomm at 3; Comments of Spectrum Bridge at 2; Comments of T-Mobile at 3-4; Comments of Verizon and Verizon Wireless (“Verizon”) at 3-4.

⁸ Comments of Alcatel-Lucent at 2.

III. THE REVISED FRAMEWORK SHOWS PROMISE BUT NEEDS FURTHER REFINEMENT TO TRIGGER INVESTMENT AND INNOVATION IN THE 3.5 GHZ BAND

The Commission should modify elements of the Revised Framework to establish a stable regulatory environment that will promote investment and deployment in the 3.5 GHz band.

PALs are the linchpin for prompt investment and innovation in the 3.5 GHz band. As Verizon notes, by focusing first on the PALs tier, “the Commission can kick-start the investment in the infrastructure, device ecosystem, and SAS database management techniques needed for the ultimate success of the Multi-Tier Framework.”⁹

Multi-Year Licensing, Renewal Expectancy, and Performance Requirements. Many commenters explain that the proposal’s one-year licensing scheme, with no renewal expectancy, would create significant uncertainty that would diminish investment and innovation in the band.

While broadband network investment requires multiple years to recover,¹⁰ the combination of one-year terms and no renewal expectancy raises the prospect of stranded investment.¹¹ As AT&T explains the conundrum:

[R]egardless of what a licensee might deploy (or how many one year terms it might obtain initially), there will be uncertainty as to whether it will continue to have access to the spectrum it uses to serve its customers after its term is over, and if so, at what cost. It might be outbid in a new auction at the end of the term, or be required to bid so much to continue to have access that its investment would be rendered uneconomical. This uncertainty will deter innovation and investment in the band.¹²

⁹ Comments of Verizon at 2.

¹⁰ See Comments of NSN at 4; Comments of Qualcomm at 3; Comments of T-Mobile at 5-6; Comments of Verizon at 8.

¹¹ See Comments of AT&T at 5.

¹² Comments of AT&T at 5.

Conversely, as T-Mobile points out, with no renewal expectancy the current proposal would allow “an entity to accumulate consecutive one-year licenses with no clear requirement to use the spectrum.”¹³

A multi-year license term, coupled with a renewal expectancy tied to performance, would address both of the risks identified above. First, entities would be much more inclined to make substantial investments in 3.5 GHz network infrastructure and device functionality if they can hold a license that extends for multiple years. Second, licensees would only retain licensed rights if they make use of the spectrum. T-Mobile, for example, calls for 10-year licenses.¹⁴ AT&T proposes a “keep what you use” type renewal expectancy “to the extent that the deployment is registered with the SAS and certified by the licensee as providing service.”¹⁵ Approaches like these will create the stable regulatory environment so important for investment and innovation.

Geographic License Areas. Commenters raise significant questions about the feasibility of issuing PALs on a geographic area basis as small as the 74,000 census tracts proposed in the Revised Framework. The benefits of a census tract approach in the Priority Access tier remain highly suspect, but the costs are clear: a more complicated licensing scheme to administer and manage, including how to address licensed areas that shift as census tracts are modified; a more burdensome licensing scheme for licensees to manage; more instances of interference given the larger amount of border areas; and, ultimately, a licensing scheme incongruous with likely PALs deployments – using the 3.5 GHz spectrum in innovative heterogeneous networks (“HetNets”) as part of wide-area commercial mobile broadband offerings.

¹³ Comments of T-Mobile at 5.

¹⁴ See Comments of T-Mobile at 6.

¹⁵ See Comments of AT&T at 5.

With licenses as small as census tracts (or smaller), the potential for interference disputes increases substantially. As Verizon observes:

With smaller sized PALs, there will be more border areas between competing co-channel PAL license holders. Border coordination will need to take into account the fact that different operators are likely to use different air interfaces. Likewise, ascertaining cell site locations and ensuring that their coverage contours are within the authorized PAL is made more difficult if the PALs are smaller and there are more of them.¹⁶

Further, the Commission must consider the practical consequences to a census-tract licensing scheme. Some commenters note that census tract licensing in urban areas may be impractical as they are so small.¹⁷ T-Mobile notes that census tract licensing will be unduly burdensome for network operators, who will be seeking to deploy small cells “throughout a market,” and it urges the use of larger geographic areas, such as counties, instead.¹⁸ For entities that want access to spectrum over smaller geographic areas or even a single building, the Revised Framework seeks comment on allowing qualified critical access facilities to receive interference protections within a portion of the GAA spectrum pool.¹⁹

These criticisms suggest the need for further consideration of larger areas. Some commenters suggest, at least as a starting point, use of traditional commercial mobile license areas or licensing on a county basis.²⁰ If the FCC nevertheless moves forward with census tract

¹⁶ Comments of Verizon at 7-8.

¹⁷ Comments of AT&T at 7. *See also* Comments of Google at 6 (“D.C. Census Tract 102, which contains the Commission’s headquarters at 445 12th Street S.W., is bounded by the centerline of Independence Avenue on the north, the centerline of 14th Street on the west, and portions of 3rd and 4th Streets on the east.”)

¹⁸ Comments of T-Mobile at 6.

¹⁹ *See* Public Notice at ¶¶ 36-38.

²⁰ *See, e.g.*, Comments of T-Mobile at 6 (counties); Comments of Verizon at 10-11 (“[T]he geographic areas, terms, and administration of licenses should approximate those used in the traditional exclusive use licensing framework, which have been proven to support substantial investment by mobile network operators deploying LTE networks.”); Comments of Qualcomm at 3 (“[Licensing at] the highly granular census tract level . . . will delay and could even preclude the necessary capital investment to

licensing, T-Mobile urges the Commission to enable package bidding for wider geographic coverage.²¹ Serious concerns have been raised, and the Commission should revise the proposed geographic licensing areas to foster, rather than discourage, investment in broadband small cell facilities in the short- and long-terms.

Fixed, Rather than Dynamic, Spectrum Assignments and Contiguous Blocks for Aggregated Holdings. The wireless industry expresses broad support for fixed, rather than dynamic, spectrum rights. AT&T notes that dynamic spectrum assignments will impair the ability of network operators to manage integrated HetNets.²² T-Mobile points out that changing from one frequency block to another requires taking a site out of service for retuning, which is incompatible with a dynamic spectrum assignment regime,²³ and changing spectrum assignments will also defeat the efficiencies of using contiguous spectrum blocks to improve capacity.²⁴ There is sufficient complexity and uncertainty related to Priority Access licensees' sharing spectrum with incumbents. While that may be appropriately addressed dynamically, there is no need to add further complications by making the Priority Access licensees' spectrum assignments dynamically variable for other reasons.

Further, while commenters support a licensee's ability to aggregate 10 MHz PALs for wider channelization, dynamic spectrum assignment would undermine such an approach. As T-Mobile notes, "the ability to use contiguous 10 megahertz blocks also means that the identity

deploy small cells in the band, which is badly needed to meet users' exponentially increasing data demands.")

²¹ Comments of T-Mobile at 7.

²² Comments of AT&T at 5.

²³ Comments of T-Mobile at 10.

²⁴ *Id.* at 11; *see also* Comments of Ericsson at 5, 7 ("Fragmentation of the spectrum would limit the ability to support higher bandwidth type services, which require more and contiguous spectrum. . . . [F]rom a device perspective, this fragmentation would necessitate support of a larger number of Carrier Aggregation options: intra-band contiguous Carrier Aggregation, intra-band non-contiguous Carrier Aggregation and inter-band Carrier Aggregation. This would increase the device complexity and cost").

of blocks must remain constant.”²⁵ Ericsson observes that allocated blocks could belong to different band classes, and this fragmentation would result in “intra-band non-contiguous Carrier Aggregation,” which would drive device complexity and cost upward.²⁶

The Commission should provide fixed spectrum assignments for Priority Access licensees and, to the extent possible, facilitate contiguous spectrum assignments of multiple 10 MHz blocks to allow for wider channelization and increased capacity.

Minimization of Federal Incumbent Exclusion Zones. The Commission should minimize the size of the exclusion zones to the extent possible.²⁷ The technical criteria for determining interference potential should be based on the most likely use case—small cells—and thereby the size of the exclusion zones may be reduced while still preventing harmful interference to incumbent operations. As Qualcomm highlights, “[p]ermitting the 3.5 GHz band to be shared by small cells will shrink the exclusion zones substantially.”²⁸ Higher powered operations could be coordinated with incumbents to prevent interference.²⁹

Extension of the 3.5 GHz Framework to 3650–3700 MHz. There is widespread recognition by wireless commenters that the public interest would be served by allowing the 3.5 GHz regime to operate in the 3650-3700 MHz band under a unified regulatory framework.³⁰ This approach, moreover, provides additional flexibility to address the issues of GAA spectrum and the avoidance of GAA interference to Priority Access operations.

²⁵ Comments of T-Mobile at 7.

²⁶ Comments of Ericsson at 7.

²⁷ Comments of Verizon at 13.

²⁸ Comments of Qualcomm at 5.

²⁹ Comments of Verizon at 13.

³⁰ See Comments of NSN at 8-15; Comments of Qualcomm at 6 n.7; Comments of T-Mobile at 14; Comments of Verizon at 4.

IV. THE RECORD OFFERS MEANINGFUL SOLUTIONS TO ADDRESS THE RISK OF GAA INTERFERENCE THAT THREATENS TO UNDERMINE PALS LICENSEE INVESTMENT AND DEPLOYMENT

The potential, under the Revised Framework, for GAA users to dynamically utilize “unused” Priority Access spectrum has raised serious concerns among wireless industry stakeholders. There is no wireless industry support for GAA access to spectrum in which a Priority Access Licensee is registered and deployed. To address this issue, wireless commenters explore a variety of potential solutions:

- Qualcomm and Nokia Solutions and Networks propose a two-tiered approach limited to incumbents and Priority Access, with the option of allowing GAA use in a separate part of the 3.5 GHz band.³¹
- AT&T and T-Mobile suggest allowing some opportunistic use of PAL spectrum in the 3.5 GHz band by GAA, but only if the Commission ensures that GAA users cannot access PAL spectrum once a PAL licensee registers deployment in the band. In no circumstance would there be GAA operations on PALs frequencies that are deployed.³²
- Verizon proposes a transition framework that would provide for two-tier, incumbent-PAL access, with GAA excluded by a hardware lock for an interim period. This would enable investment in the short-term without having to address all the GAA interference issues prior to deployment. The FCC would continue to move forward on a “multi-tier” band where GAA and PAL have spectrum assignments and GAA can access PAL spectrum opportunistically on a tertiary basis once interference risks are managed.³³

These potential solutions are all valuable attempts to solve a single problem—the potential for interference to PAL operations due to opportunistic use by GAA under SAS control. As Verizon points out, there are many issues that need to be studied and addressed before we know whether safe and interference-free opportunistic sharing is possible.³⁴

CTIA submits that the Commission should take these concerns seriously. The wireless industry has put some potential solutions on the table, with an aim towards addressing both

³¹ See Comments of Qualcomm at 3; Comments of Nokia Solutions and Networks at 19-20.

³² See Comments of AT&T at 6 & n.12; Comments of T-Mobile at 3, 9,

³³ See Comments of Verizon at 4-11.

³⁴ Verizon identifies technical, security, regulatory, and administrative issues that must be resolved before allowing GAA users to share spectrum with Priority Access licensees. *Id.* at 5-8.

short-term and long-term stability and predictability in the interest of encouraging investment and innovation in the 3.5 GHz band.

V. CONCLUSION

For the reasons discussed above, the Commission should focus first on creating a stable regulatory environment in the Priority Access tier, offering licensing terms that will promote investment and innovation in the 3.5 GHz band.

Respectfully submitted,

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