

**Before the  
Federal Communications Commission  
Washington, D.C. 20554**

In the Matter of )  
 )  
Expanding the Economic and Innovation ) GN Docket No. 12-268  
Opportunities of Spectrum Through )  
Incentive Auctions )

To: Chief, Wireless Telecommunications Bureau

**REPLY COMMENTS OF  
THE WIRELESS INTERNET SERVICE PROVIDERS ASSOCIATION**

The Wireless Internet Service Providers Association (“WISPA”) hereby provides its Reply Comments to address certain of the Comments filed in response to the *Public Notice* seeking public input on issues related to 600 MHz band plans.<sup>1</sup> As the Commission weighs the merits of the various proposed band plans, consistent with the objectives of this proceeding, it must also consider the impact those band plans and unrestrained “market variation” would have on the ability of wireless Internet service providers (“WISPs”) to deploy fixed wireless broadband services using TV “white space” spectrum. In addition to the challenges of resolving the technical issues that would exist if TV broadcasters and mobile wireless carriers were to share a portion of the band, the Commission must also consider how fixed mobile licensees and unlicensed users can effectively share spectrum, a task that would appear to require significant study. A more simple, effective and efficient approach would be to limit spectrum recovery to spectrum above Channel 37. The Commission should ensure that the band plan preserves white space spectrum for fixed services and, where possible, should attempt to ensure that a minimum

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<sup>1</sup> *Public Notice*, “Wireless Telecommunications Bureau Seeks to Supplement the Record on the 600 MHz Band Plan,” GN Docket No. 12-268, DA 13-1157 (rel. May 17, 2013) (“*Public Notice*”).

of 36 megahertz of *contiguous* spectrum above Channel 20 in each market is reserved for unlicensed use following the repacking.

## Discussion

### I. THE RECORD SUPPORTS ADOPTION OF THE “DOWN FROM 51” BAND PLAN.

The record shows near universal support for some version of the “Down from 51” FDD band plan,<sup>2</sup> a view that WISPA shares.<sup>3</sup> Among the many reasons advanced for that plan, more spectrum above Channel 37 can be recovered than under alternative proposals that would require a guard band to protect uplink spectrum in the Lower 700 MHz A Block (698-703 MHz). This, in turn, would reduce the desire to auction spectrum below Channel 37, a result that preserves a greater amount of unlicensed TV band spectrum.

In opposing the Commission’s “Down from 51 Reversed” proposal, NCTA expressed similar concern that the alternatives proposed in the *Public Notice* “would shortchange unlicensed use.”<sup>4</sup> Although seemingly focused on the duplex gap for Wi-Fi use, NCTA cogently observed that, among other things, “a contiguous block of spectrum will allow for a greater range of unlicensed devices, higher throughput, advanced techniques for managing out-of-band

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<sup>2</sup> See, e.g., Comments of CTIA – The Wireless Association, GN Docket No. 12-268 (June 14, 2013) at 6; Comments of AT&T Inc., GN Docket No. 12-268 (June 14, 2013) (“AT&T Comments”) at 7-10; Comments of Qualcomm Incorporated, GN Docket No. 12-268 (June 14, 2013) at 3-9; Comments of Research in Motion Corporation, GN Docket No. 12-268 (June 14, 2013) at 11-14; Comments of Alcatel-Lucent, GN Docket No. 12-268 (June 14, 2013) (“Alcatel-Lucent Comments”) at 2-6; Comments of the Consumer Electronics Association, GN Docket No. 12-268 (June 14, 2013) (“CEA Comments”) at 1-3; Comments of Ericsson, GB Docket No. 12-268 (June 14, 2013) (“Ericsson Comments”) at 12; Comments of Verizon and Verizon Wireless, GN Docket No. 12-269 (June 14, 2013) (“Verizon Comments”) at 2; Comments of Motorola Mobility LLC, GN Docket No. 12-268 (June 14, 2013) at 1-2; Comments of T-Mobile USA, Inc., GN Docket No. 12-268 (June 14, 2013) at 1-2; Comments of Spectrum Management Consulting Inc., GN Docket No. 12-268 (June 14, 2013) at 1; Comments of GE Healthcare, GN Docket No. 12-268 (June 14, 2013) at 3. As discussed in Section III, *infra*, WISPA does not endorse aspects of these Comments that seek to auction spectrum below Channel 37.

<sup>3</sup> See Comments of WISPA, GN Docket No. 12-268 (June 14, 2013) (“WISPA Supplemental Comments”) at 2-3. A few parties prefer a “Down from 51” TDD approach. See, e.g., Comments of Sprint Nextel Corporation, GN Docket No. 12-268 (June 14, 2013) at 5-17; Comments of Clearwire Corporation, GN Docket No. 12-268 (June 14, 2013) at 3-11; Comments of Cellular South, Inc., GN Docket No. 12-268 (June 14, 2013) at 3-8.

<sup>4</sup> See Comments of the National Cable & Telecommunications Association, GN Docket No. 12-268 (June 14, 2013) at 1.

emissions and the potential for a common ‘control channel’ across markets . . . [and] would also support wide-area wireless Internet systems....”<sup>5</sup> These benefits apply to the remaining white space spectrum and demonstrate cross-industry support for rules that seek to make efficient use of the TV band for licensed as well as unlicensed use, whether in guard bands, duplex gaps or post-repacked white spaces.

WISPA agrees with Verizon’s suggestion that the Commission should first establish the repacking methodology to help determine the “minimum threshold” of spectrum that could be auctioned on a nationwide basis.<sup>6</sup> In so doing, the Commission also should implement the repacking techniques that WISPA<sup>7</sup> and others<sup>8</sup> have offered that would enable spectrally efficient use of TV band spectrum.

## **II. THE COMMISSION SHOULD AVOID “MARKET VARIATION” WHEREVER POSSIBLE.**

The WISPA Supplemental Comments pointed out the inherent threat that unrestrained “market variation” would present to unlicensed use of the TV bands.<sup>9</sup> As WISPA explained, offering different amounts of uplink or downlink spectrum in different markets could potentially result in the auctioning of all TV band spectrum, leaving little useable spectrum for fixed broadband users. WISPA demonstrated that this would not only be contrary to the policy objectives of this proceeding, but that significant technical issues would drastically reduce the utility of unpaired spectrum and the availability of equipment.

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<sup>5</sup> *Id.* at 5 (footnotes omitted). NCTA states that “the fragmented and non-uniform nature of the available spectrum under [the TV white space] rules limits the utility of that spectrum for current and anticipated unlicensed technologies. *Id.*, n.18. Under WISPA’s proposals to optimize the availability of contiguous white space spectrum, more products and users will utilize vacant TV band spectrum for fixed broadband, Wi-Fi and other services.

<sup>6</sup> Verizon Comments at 11.

<sup>7</sup> Comments of WISPA, Docket No. 12-268, *et al.* (Jan. 25, 2013) (“WISPA Initial Comments”) at 12-29; Reply Comments of WISPA, Docket No. 12-268, *et al.* (Mar. 12, 2013) at 5-15.

<sup>8</sup> *See, e.g.*, Comments of the Public Interest Spectrum Coalition, Docket No. 12-268, *et al.* (Jan. 25, 2013); Comments of Spectrum Bridge, Inc., Docket No. 12-268, *et al.* (Jan. 23, 2013); Comments of SpectrumEvolution, Inc., Docket No. 12-268 (Jan. 25, 2013).

<sup>9</sup> *See* WISPA Supplemental Comments at 4-5.

Other parties expressed additional concerns about market variation. Sinclair cogently observed that varying the amount of spectrum that can be cleared would result in more spectrum clearing in rural markets, stating that:

a sensibly oriented variable approach would clear a certain amount of spectrum nationwide, plus some *additional* spectrum in the most densely populated areas. But what the Public Notice contemplates is just the opposite. The Public Notice proposes clearing what can be cleared in the largest markets and then clearing *additional* spectrum in smaller markets and rural areas, apparently just because it can be done.<sup>10</sup>

Echoing these concerns, the Block Stations call market variation “a naked spectrum recovery maximization plan designed to reclaim as much spectrum as possible in small markets.”<sup>11</sup> NAB warned that “[a]ttempting to maximize spectrum recovery through a variable band plan in rural areas also will seriously harm low power television stations and translator stations that are currently providing essential services to the American people.”<sup>12</sup> These statements precisely articulate WISPA’s concerns – that band-clearing will be easier to accomplish in rural markets, and the Commission could elect to auction as much spectrum as it can, at the expense of spectrum that should and would otherwise be available for unlicensed use.

Not only would this outcome be contrary to policy, it also presents serious interference concerns. NAB cautioned that the Commission must “*first* grapple with the serious engineering challenges that accompany” market variation, something it “has failed altogether to acknowledge.”<sup>13</sup> AT&T discussed “a fundamental challenge to the notion of market variability itself: the potential for co-channel interference from TV broadcast transmissions to wireless base

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<sup>10</sup> Comments of Sinclair Broadcast Group, Inc., GN Docket No. 12-268 (June 14, 2013) (“Sinclair Comments”) at 3.

<sup>11</sup> Comments of Lima Communications Corporation, *et al.*, GN Docket No. 12-268 (June 14, 2013) (“Block Stations Comments”) at 4.

<sup>12</sup> Comments of the National Association of Broadcasters, GN Docket No. 12-268 (June 14, 2013) (“NAB Comments”) at 11. *See also* Block Stations Comments at 4.

<sup>13</sup> NAB Comments at 4 (emphasis in original).

station receivers.”<sup>14</sup> AT&T stated that its preliminary analysis shows that there would need to be co-channel separation of more than 200 kilometers between TV transmitters and mobile wireless base station receivers and that “[s]uch separation distances would seem to indicate that it could be difficult to tolerate variations in the amount of spectrum offered at auction on an EA-by-EA basis.”<sup>15</sup> For similar reasons, TV broadcasters also oppose variable band plans. Sinclair stated that “any variable plan that places low power wireless bands co-channel with very high power broadcast assignments in adjacent markets is simply unworkable.”<sup>16</sup> From the broadcast engineering perspective, Cohen, Dippell and Everist affirmed that “co-mingling various types of non-heterogeneous operations in the same band as the off-the-air TV band, is fraught with technical problems.”<sup>17</sup>

The Sinclair Comments echoed the WISPA Supplemental Comments with respect to the value of unpaired blocks to the mobile wireless industry, positing that:

regional carriers will have little or no interest in licenses to “remnant” spectrum blocks because those carriers will assume, correctly, that device makers will not design for operation on those blocks unless required to do so by the largest carriers. Larger carriers will have less interest in remnant blocks because the cost of making tens or hundreds of millions of devices that can use those blocks is not justified when those blocks will be available only in the areas where incumbent carriers simply do not need additional spectrum.<sup>18</sup>

CIT Group, a lender to both broadcast and mobile wireless interests, indicated that the technical concerns attendant to market variation present “negative factors” such as “higher equipment costs, delays in being able to initiate revenue generating service, and marketing obstacles.”<sup>19</sup>

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<sup>14</sup> AT&T Comments at 4.

<sup>15</sup> *Id.* at 5.

<sup>16</sup> Sinclair Comments at 2.

<sup>17</sup> Comments of Cohen, Dippell and Everist, P.C., GN Docket No. 12-268 (June 14, 2013) at 3. These Comments cite a number of historical cases where disparate uses caused interference to TV operations. *See id.* at 2-3. *See also* NAB Comments at 2-3, n.5 (noting that “due to unresolved interference issues, the 700 MHz A block sold for only about 40% of the amount the B block did in the same auction”).

<sup>18</sup> Sinclair Comments at 1-2.

<sup>19</sup> Comments of CIT Group Inc., GN Docket No. 12-268 (June 14, 2013) (“CIT Comments”) at 2.

Proponents of auctioning different amounts of spectrum in different geographic areas ignore the adverse impact that market variation would have on unlicensed uses. They instead ask the Commission to auction unpaired spectrum below Channel 37, even while acknowledging the “increased risk of interference from co-channel TV broadcast operations in other markets where less spectrum is cleared and reallocated.”<sup>20</sup> Alcatel-Lucent suggested that market variation may have some merit, but acknowledged the interference “challenges” and the potential for “a daisy chain effect, where interference from TV stations operating in Market A might constrain Market B, which might constrain Market C, and so on.”<sup>21</sup> It suggested a complex method of enabling market variation that would create “artificial inflexion points,” but recognized that this plan is dependent on software and design capabilities.<sup>22</sup> Ericsson asked the Commission to allocate 120 megahertz of spectrum, with some reserved for supplemental downlink under the “Down from 51” band plan, yet acknowledged that “[t]he level of variability on a geographical basis in the amount of licensed spectrum cleared by the incentive auctions has a potential cost in terms of increased complexity of end-user equipment (due to, for example, the need for multiple filters) and performance (due to the presence of multiple sources of interference in markets that have not cleared as many high powered television broadcasters as others).”<sup>23</sup> Although these parties favored market variation under a “Down from 51” band plan, they all appreciate that significant technical challenges must be addressed. They utterly fail to discuss the reduction in unlicensed spectrum that would remain in the TV bands, which is yet another substantial reason why market variation should be rejected.

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<sup>20</sup> CEA Comments at 3, n.6.

<sup>21</sup> Alcatel-Lucent Comments at 6. *See also* NAB Comments at 6.

<sup>22</sup> *Id.* at 7.

<sup>23</sup> Ericsson Comments at 2.

WISPA, mobile wireless carriers, broadcasters and investors – all with different perspectives and different interests to protect – are singing from the same page. Market variation is an ill-conceived idea that could lead to the demise of unlicensed TV band spectrum in rural markets. Further, significant interference issues, deployment difficulties and uncertainties that jeopardize investment needed for the auction must be overcome. The Commission should reject its proposal to auction varying amounts of spectrum in different markets and instead adopt a uniform nationwide “Down from 51” band plan that preserves unlicensed TV white space spectrum as a vital resource for fixed broadband service and innovation.

### **III. THE COMMISSION SHOULD NOT AUCTION SPECTRUM BELOW CHANNEL 37.**

Whether the Commission incorporates market variation into the band plan or not, it should not auction any spectrum below Channel 37. Under a “Down from 51” band plan, the Commission can recover a significant amount of spectrum between Channels 38 and 51. To quote Sinclair, “[t]he record does not reflect any credible path to clearing more than the 84 MHz from Channel 51 to Channel 37 in all the major markets. And any spectrum that cannot be cleared in all of the major markets is far less useful to wireless carriers.”<sup>24</sup> Focusing on the value of spectrum below Channel 37, CIT agreed with WISPA and others that any band plan that includes spectrum below Channel 37 will actually result in the reduction in the band’s overall value, and an overall diminution of auction proceeds, because of the added costs and technical difficulties of implementing the band plan.”<sup>25</sup>

Not to be overlooked is the post-repacking availability of TV band spectrum for unlicensed use. Unlicensed users will share spectrum with existing and repacked broadcasters in

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<sup>24</sup> Sinclair Comments at 4.

<sup>25</sup> CIT Comments at 5.

significantly less spectrum than exists today, a prospect that is creating uncertainty among equipment manufacturers that would like to make white space equipment and WISPs that would like access to a meaningful amount of unlicensed TV band spectrum. Introducing licensed mobile services in this band – whether for uplink or downlink – would shrink the amount of spectrum available for unlicensed use and force unlicensed users to protect mobile wireless users as well as broadcasters.

The Commission has considered and adopted rules for spectrum sharing between unlicensed users and TV stations, but has not considered the co-channel and adjacent-channel interference protection requirements or the spectrum sharing techniques that would be required to allow unlicensed services to co-exist with future licensed services in the band. The Commission has not developed service rules for licensed users of auctioned spectrum and thus there is no established baseline upon which to test interference between unlicensed users and licensees in the same band. The record in the 5 GHz rulemaking proceeding suggests that this analysis will be a daunting task.<sup>26</sup> Just as there has been “no practical experience in sharing between DSRC and U-NII” in the 5850-5925 MHz band,<sup>27</sup> there has been no testing or analysis of sharing among unlicensed fixed devices and licensed mobile operations in the TV bands. Even the sharing rules for TV white spaces – which established protection contours and geolocation database requirements to protect licensed fixed operations from unlicensed fixed operations – took many years to implement.

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<sup>26</sup> In that proceeding, the Commission is considering the extent to which Dedicated Short Range Communications (“DSRC”) service licensees in the 5850-5925 MHz band can share spectrum with unlicensed users. *See* Revision of Part 15 of the Commission’s Rules to Permit Unlicensed National Information Infrastructure (U-NII) Devices in the 5 GHz Band, *Notice of Proposed Rulemaking*, ET Docket No. 13-49 (rel. Feb. 20, 2013) (“5 GHz NPRM”). The 5 GHz NPRM cites an NTIA report recommending “additional analysis . . . to determine the feasibility of introducing U-NII devices into” the 5850-5925 MHz band. *See id.* at 33. Because DSRC and the new 802.11ac share a common heritage, sharing in the 5850-5925 MHz band would be theoretically easier.

<sup>27</sup> Comments of Cisco Systems, Inc., ET Docket No. 13-48 (May 28, 2013) at 64.

If the Commission is prepared to take on the task of developing a record and testing potential spectrum sharing techniques, it should also recognize the significant delay inherent in that process. The better course would be for the Commission to heed CIT's advice – "eschew complexity and flexibility in favor of simplicity and consistency."<sup>28</sup>

#### **IV. THE COMMISSION SHOULD AUCTION SPECTRUM IN CELLULAR MARKET AREAS.**

WISPA and others have asked the Commission to auction 600 MHz spectrum according to Cellular Market Areas ("CMAs").<sup>29</sup> WISPA is pleased that the Competitive Carriers Association has formally embraced this proposal, citing the greater opportunities for auction participation by small companies, increased competition in the auction and increased revenues.<sup>30</sup> The Commission should adopt this proposal.

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<sup>28</sup> CIT Comments at 7.

<sup>29</sup> See WISPA Initial Comments at 30; Comments of United States Cellular Corporation, Docket No. 12-268 (Jan. 25, 2013) at 12; Comments of the Rural Telecommunications Group, Inc., Docket No. 12-268 (Jan. 25, 2013) at 3. See also Comments of the Competitive Carriers Association, Docket No. 12-268 (Jan. 25, 2013) at 14-15 (urging auctioning by small markets); Comments of Leap Wireless International, Inc. and Cricket Communications, Inc., Docket No. 12-268 (Jan. 25, 2013) at 4 (suggesting auctioning by CMA).

<sup>30</sup> See Comments of the Competitive Carriers Association, GN Docket No. 12-268 (June 14, 2013) at 7-10.

## Conclusion

The Commission should adopt a uniform nationwide band plan that auctions paired spectrum between Channels 38 and 51 and leaves sufficient spectrum available below Channel 37 for unlicensed users and licensed TV stations. There is little meaningful support for “market variation” at this time, and the record contains no evidence concerning the consequences of spectrum sharing or the extensive analysis that would be required to introduce effective spectrum sharing rules. Any band plan the Commission adopts must consider the benefits that unlicensed TV band spectrum can and will create, especially in rural and unserved areas.

Respectfully submitted,

**WIRELESS INTERNET SERVICE  
PROVIDERS ASSOCIATION**

June 28, 2013

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