

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

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

**REPLY COMMENTS OF  
THE NATIONAL ASSOCIATION OF BROADCASTERS**

**I. Introduction and Summary**

If the general industry and public interest view with regard to the post-auction 600 MHz band plan was not clear prior to the Wireless Telecommunications Bureau’s May 17, 2013, *Public Notice*,<sup>1</sup> it certainly should be now. Despite minor disagreements on smaller points concerning the band plan, following both the Notice of Proposed Rulemaking<sup>2</sup> and the *Public Notice*, a general consensus among incentive auction stakeholders has come into clear focus. The record on the band plan reflects areas of overwhelming agreement and one very clear area for further immediate exploration. Areas of consensus include:

- The Commission should adopt the “Down from 51” plan with a common fixed duplex gap.<sup>3</sup>

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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 (rel. May 17, 2013).

<sup>2</sup> *Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions*, Notice of Proposed Rulemaking, 27 FCC Rcd 12357 (2012) (NPRM).

<sup>3</sup> NAB does believe, however, that if the Commission insists on instituting multiple variable plans, then “Down from 51 Reversed” is a better fit for broadcasters. See Comments of the National Association of Broadcasters in GN Docket No. 12-268 (filed June 14, 2013), at 7-8.

- Broadcasters should, under no circumstances, be located in the duplex gap.
- There should be a minimum guard band size designed to prevent interference between broadcast and wireless services.

While the above elements may not have complete unanimity, they all enjoy overwhelming support from a wide range of stakeholders. They have that support based on sound engineering and the ability they provide industry to deliver high-quality mobile broadband and broadcast services to the greatest number of consumers and viewers, respectively. Nothing in the record suggests any reason to stray from those core tenants.

Apart from issues smaller in scope, such as whether it is wise to pair up to 35 megahertz of spectrum (should the auction yield at least 84 megahertz), only one major problem prevents the Commission from being able to adopt a band plan order: the lack of serious study on the co- and adjacent channel interference challenges inherent in variable plans.<sup>4</sup> Indeed, the only thorough analysis in the record – provided by NAB and others without prompting – suggests that variability is a major concern and likely one that

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<sup>4</sup> Commission staff has never suggested that it has looked at this issue with any degree of depth, as particularly indicated by footnote 17 in the *Public Notice*. Alcatel-Lucent explained why the Wireless Bureau erred in its response to the need for large (or any) separation distances between broadband and broadcast operations operating co-channel. Specifically, Alcatel-Lucent points out “the issue is that constraints in one market can cause 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.” Alcatel-Lucent additionally observes that this problem is particularly severe along the eastern seaboard and concludes that, at least with respect to some geographic regions, there may not be practical engineering solutions that would allow maximum variability on a market by market basis. See Comments of Alcatel-Lucent in GN Docket No. 12-268 (filed June 14, 2013), at 6-7.

Moreover, as Verizon asserts, “if the Commission has determined that co-channel interference issues can be mitigated without unduly impairing the value and generic nature of licensed blocks in higher-clearing markets, it should provide that analysis.” Comments of Verizon and Verizon Wireless in GN Docket No. 12-268 (filed June 14, 2013), at 3.

will make impossible certain key features of the proposed auction design (e.g., making licensed blocks fungible), ultimately drive down auction revenues and lead to significant interference between broadband and broadcast providers. Variability should not come at the expense of *viability*. The Commission must weigh variability's benefits against the significant constraints imposed by resulting interference between broadcast and wireless operations.

As detailed below (and in our prior comments in this proceeding), NAB has developed an alternative based on a *national*, as opposed to market-by-market, plan that will help achieve Congress's and the Commission's goals of raising sufficient revenue to fund an interoperable public safety broadband network, free up additional spectrum for mobile broadband and ensure a healthy and robust broadcast industry. Our plan is simple, cost-effective and allows the Commission to avoid the significant interference challenges inherent in variable plans.

## **II. Commenters Make Clear that the Commission Must Immediately and Rigorously Analyze the Effects of Co- and Adjacent Channel Interference Inherent in Variable Plans**

Variability in this context is a threshold issue much like overload interference was in the LightSquared proceeding. If the Commission does not study and address it, then the law will not allow the Commission to employ it. One outcome of a rigorous look at the effects of co- and adjacent channel interference might very well demonstrate that the costs of variability outweigh its perceived benefits. But it is also possible that, along with industry and the public interest community, the Commission could develop a solution that

allows it to pursue some measure of variability.<sup>5</sup> The Commission cannot know the correct answer, however, unless it poses the relevant questions and conducts the necessary technical analysis.

NAB is not alone in recognizing the seriousness of this issue and strongly urging the Commission to act expeditiously. AT&T addressed what it calls “a fundamental challenge to the notion of market variability itself: the potential for co-channel interference from TV broadcast transmission signals to wireless base station receivers. Co-channel interference may, at a minimum, render unwise any effort, including that reflected in the Public Notice, to value accommodation of market variability over other band plan goals.”<sup>6</sup> More specifically, AT&T notes that it “has begun to study closely the issue of co-channel interference from TV broadcast transmission signals to wireless base station receivers, and preliminary indications are that separation distances could significantly limit the ability to offer different amounts of spectrum at auction on an Economic Area (“EA”)-by-EA basis.”<sup>7</sup>

Verizon agrees, commenting that “[a]ny band plan – including those in the Notice – must address co-channel interference if broadcasters in some lower-clearing markets will

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<sup>5</sup> For example, Verizon suggests that after further study, perhaps it would be viable to handle the significant challenge of co-channel interference by dividing the country into five regions. It posits that this “would eliminate all co-channel interference within each region. There would still be co-channel interference issues between different regions, and between regions and the Canadian and Mexican borders, but those issues could be predicted, and the borders could be set in rural areas where mitigation techniques such as geographic separation zones would be less likely to impair valuable spectrum.” Verizon Comments at 10.

<sup>6</sup> Comments of AT&T Inc. in GN Docket No. 12-268 (filed June 14, 2013), at 4-5.

<sup>7</sup> *Id.* at 3.

be located on channels used for mobile operations in adjacent higher-clearing markets.”<sup>8</sup>

This is because, “[i]n any band plan, there will be potential co-channel interference everywhere a higher clearing market is adjacent to a more constrained market,” due to “interference between mobile operations in higher-clearing markets and broadcast operations on the same channels in adjacent lower-clearing markets.”<sup>9</sup>

Ericsson addresses the issue in its comments as well. From a network provider and operator standpoint, it argues 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 . . . 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>10</sup> It therefore concludes that variability “can lead to market fragmentation of the 600 MHz band.”<sup>11</sup>

Qualcomm focuses in particular on the challenges of variability in the uplink portion of an FDD pairing (and throughout a TDD-based approach). It states plainly that “the FCC should not allow uplink operations co-channel with TV stations operating in adjacent markets and should strive to develop a feasible national band plan . . . .”<sup>12</sup>

As shown by the record overall and in these comments specifically, the Commission must undertake a rigorous and in depth analysis of this issue. It is highly

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<sup>8</sup> Verizon Comments at 1.

<sup>9</sup> *Id.* at 3. Verizon suggests that a small amount of variability may be possible. *Id.* at 8. (“Nevertheless, it would likely be possible to tolerate a very small number of markets that are impaired by such mitigation techniques as long as a substantial majority of markets (especially the high-value markets) are not impaired.”).

<sup>10</sup> Comments of Ericsson in GN Docket 12-268 (filed June 14, 2013), at 2.

<sup>11</sup> *Id.*

<sup>12</sup> Comments of Qualcomm, Inc. in GN Docket No. 12-268 (filed June 14, 2013), at 15.

complex and threatens to undermine the entire auction design proposed in the NPRM. As AT&T notes, “[t]he separation distances reflected in AT&T’s limited preliminary analysis certainly suggest that addressing co-channel interference will demand much effort and ingenuity.”<sup>13</sup> Research in Motion also addresses the need for “[f]urther analysis . . . to understand how to truly maximize the use of the spectrum rather than just the amount of spectrum [repurposed].”<sup>14</sup> More specifically, RIM asserts that “[a] comprehensive policy discussion could include discussions on,” among other things, “the question of whether maximizing spectrum in markets that may not need the benefit of these frequencies would cause additional hardship to markets that will have the most to gain from access to the 600 MHz band, and . . . whether the advantages of multiple bands would outweigh the benefits of a single harmonized band.”<sup>15</sup>

All indications are that the co- and adjacent channel problems that variability causes are quite significant and would be impactful on the auction design. As Verizon states, “[a]bsent natural barriers between markets, such as mountains that mitigate co-channel interference, geographic separation zones of 200-400 km would likely be required to mitigate interference from broadcaster transmitters into wireless base stations.”<sup>16</sup> AT&T believes that “the analysis suggests that separation distances between TV transmitters and wireless base station receivers would generally need to be in the range of more than 200 kilometers in order to avoid harmful co-channel interference to

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<sup>13</sup> AT&T Comments at 7. AT&T adds that “co-channel interference may require renewed analysis of how any band plan should be implemented.” *Id.* at 5.

<sup>14</sup> Comments of Research in Motion Corp. (RIM) in GN Docket No. 12-268 (filed June 14, 2013), at 5.

<sup>15</sup> RIM Comments at 5, n.7.

<sup>16</sup> Verizon Comments at 8.

mobile base station receivers. Such 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>17</sup> Qualcomm’s comments, which focused on comparing the likely co-channel interference difficulties for uplink versus downlink, offers that “[b]ased on [its] calculations, the distances [in which interference will occur] are approximately 500 km (or 310 miles) for TV to mobile uplink and as compared to approximately 100 km for TV to mobile downlink.”<sup>18</sup>

Although NAB did not take a formal position on the wisdom of utilizing a TDD versus FDD band plan under a nationwide approach, it appears that, if the Commission is considering adopting a variable plan, a TDD-based plan poses even greater interference challenges. As Verizon explains, “a TDD band plan would create even more complexity because each frequency is used for both uplink and downlink, so the co-channel interference scenarios are doubled for each frequency block.”<sup>19</sup>

Both Ericsson and Qualcomm agreed. Ericsson observes that “it will be more difficult to avoid uplink co-channel interference between different markets (that may require coordination between the aggressor TV transmitter and the victim base station) since any victim TDD channel is bidirectional and all TDD channels allocated carry uplink traffic for part of the time.”<sup>20</sup> Qualcomm adds that “a TDD band plan is perhaps the worst plan to accommodate market variation because a TDD plan would place mobile uplink operations throughout the entire 600 MHz band and thus subject mobile base stations to

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<sup>17</sup> AT&T Comments at 5.

<sup>18</sup> Qualcomm Comments at 14.

<sup>19</sup> Verizon Comments at 3.

<sup>20</sup> Ericsson at 6.

harmful interference from full power cochannel TV broadcast stations up to 500 km (or 310 miles) away.”<sup>21</sup>

One remaining challenge is how the Commission could adopt the “right” band plan prior to knowing how much spectrum will eventually be recovered and where. Many commenters have offered their band plan proposals based on predictions about the amount of spectrum being recovered on a national and/or market-by-market basis.<sup>22</sup> It is difficult to comment on a number of hypothetical scenarios that may or may not come to pass. NAB believes commenting on these different hypothetical permutations is counterproductive and will only add to ongoing confusion about the band plan and hinder progress in this proceeding.

### **III. There Is a Straightforward Path for Addressing the Challenges at Hand and Providing the Highest Level of Certainty**

To discourage and limit speculation and uncertainty about how much spectrum eventually will be recovered, and to avoid the interference challenges inherent in the proposed variable plan, NAB has proposed an alternate construct that incorporates three relatively easy steps in developing a *nationwide* plan.<sup>23</sup> Specifically, NAB proposes that:

- After setting a reasonable spectrum acquisition target (e.g., between 60 and 84 MHz), lay out the various nationwide repacking scenarios to determine the areas in which the Commission must have volunteers and how many it needs.
- Determine how much revenue will likely be raised from a forward auction of the target amount of spectrum.

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<sup>21</sup> Qualcomm Comments at 15.

<sup>22</sup> See *generally* Comments of T-Mobile in GN Docket No. 12-268 (filed June 14, 2013); Reply Comments of Intel Corporation in GN Docket No. 12-268 (filed Mar. 12, 2013); AT&T Comments in GN Docket No. 12-268 (filed Jan. 25, 2013).

<sup>23</sup> See Reply Comments of NAB in GN Docket No. 12-268 (filed March 12, 2013), at 20-21.

- Use those anticipated (and soon to be realized) funds to incentivize broadcasters in areas where spectrum is actually needed, and, where no volunteers are needed to achieve the nationwide goal, then simply repack broadcasters.

This proposal helps the Commission maximize its use of the information it has up front – where it will and will not need participants under various scenarios – and then focus its financial incentives where volunteers are truly needed. Using this up front information and forward auction funds to clear the most needed markets would eliminate the so-called “lowest common denominator” problem where spectrum recovery is limited to that available in the most constrained markets. If done correctly, we believe the Commission can develop an effective wireless band plan that clears the same robust amount in every market (international coordination notwithstanding), and leads to a harmonious balance between broadcasters and wireless operations in the new 600 MHz band.

#### **IV. Conclusion**

There are many aspects of the 600 MHz band plan that are ready for resolution, enabling the Commission to move forward expeditiously towards its goal of a near-term incentive auction. One major problem, however, remains outstanding, and it requires serious and immediate attention. As numerous commenters have noted, the Commission must rigorously study the effect of variability on interference between broadcasters and wireless operators. This threshold issue can no longer be treated as an afterthought because, if left unaddressed, it threatens to at least delay the auction, if not undermine its effectiveness. NAB has done substantial work in this area and hopes

to actively engage with Commission staff to help determine whether the benefits of variability outweigh its obvious and significant costs.

Respectfully submitted,



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