

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

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

**COMMENTS OF  
THE NATIONAL ASSOCIATION OF BROADCASTERS**

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The National Association of Broadcasters (NAB)<sup>1</sup> hereby responds to the *Public Notice (Notice)* issued by the Wireless Telecommunications Bureau (WTB or Wireless Bureau) on May 17, 2013.<sup>2</sup> The *Notice* focuses specifically on the 600 MHz band plan to be employed as part of the Federal Communications Commission’s (FCC or Commission) incentive auction proceeding.<sup>3</sup>

**I. Introduction and Summary**

The May 17 *Notice* follows initial comments on the 600 MHz band plan submitted in the incentive auction docket in January, reply comments filed in March and an FCC public workshop held two weeks prior to the *Notice*’s circulation in May. Despite a robust record, however, the *Notice* makes only passing reference to and asks no

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<sup>1</sup> NAB is a nonprofit trade association that advocates on behalf of local radio and television stations and broadcast networks before Congress, the FCC and other federal agencies, and the courts.

<sup>2</sup> See Public Notice, “Wireless Telecommunications Bureau Seeks to Supplement the Record on the 600 MHz Plan,” GN Docket No. 12-268 (rel. May 17, 2013).

<sup>3</sup> *Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions*, Notice of Proposed Rulemaking, 27 FCC Rcd 12357 (2012) (NPRM).

questions about one of the most critical unresolved elements of the 600 MHz band plan: *the interference implications of broadcasters and wireless carriers operating on co- and adjacent channels in neighboring markets* under a variable band approach. Without resolving this critical issue, the Commission cannot reasonably employ a variable plan in light of the record in this proceeding.<sup>4</sup>

With respect to the options specifically raised in the *Notice*, they each fail to address the challenge of co- and adjacent channel interference from wireless and broadcast operations in neighboring markets. Each of the alternative proposals offered in the *Notice* consequently still threatens to cause widespread harmful interference to both broadcast and wireless operations in the 600 MHz band, and harm the prospects for a successful auction. If the Commission is intent on proceeding with a variable plan, however, then NAB favors the “Down from 51 Reversed” proposal, which does not exacerbate the inherent challenges that accompany variability to the same degree as the alternate proposals.

Recent experiences demonstrate that inadequate interference planning can undermine an auction by potentially deterring participation and depressing revenue to

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<sup>4</sup> See, e.g., *American Radio Relay League, Inc. v. FCC*, 524 F.3d 227, 241 (D.C. Cir. 2008) (finding that FCC erred in failing to provide a “reasoned justification” for retaining certain extrapolation factor “sufficient to indicate that it has grappled with” submitted data supporting a different factor); *Cincinnati Bell Telephone Co. v. FCC*, 69 F.3d 752, 763-64 (6th Cir. 1995) (finding that rules restricting certain bidders in upcoming wireless auction were arbitrary, because the record lacked “factual support” for FCC’s conclusions); *Achernar Broadcasting Co. v. FCC*, 62 F.3d 1441, 1447 (D.C. Cir. 1995) (finding that FCC acted arbitrarily and capriciously in failing to consider all aspects of a problem and in failing to examine a viable option); *MCI Telecommunications Corp. v. FCC*, 842 F.2d 1296, 1305-6 (D.C. Cir. 1988) (finding that FCC acted arbitrarily and capriciously by reaching a conclusion without obtaining the “data necessary” to ground its decision).

the U.S. Treasury.<sup>5</sup> If the Wireless Bureau continues to be locked into market variability it must, as a precursor, rigorously evaluate the issues raised throughout the record concerning co- and adjacent-channel interference and its impact on the proposed band plans. Only then can the FCC and the broadcast and wireless industries know whether, as a matter of engineering, meaningful market variability is even possible.<sup>6</sup> The band plan options introduced in the *Notice* skirt this issue entirely, evidently favoring academic economic flexibility over real-world engineering.

## **II. The *Notice* Does Not Recognize or Address the Engineering Challenges Raised by Market Variability**

The *Notice* recognizes that the majority of commenters in the record and attendees at the band plan workshop on May 3 oppose the *NPRM*'s "split" band plan and overwhelmingly favor its alternative "down from 51" approach. The Wireless Bureau does not take issue with the engineering conclusions reached by these commenters, but does not adopt the near-consensus approach that has emerged. Rather, the *Notice* asserts that the "Down from 51" approach "limit[s] the amount of market variation that can be achieved," or put differently, constrains the Commission's ability to "offer[] varying amounts of spectrum in different geographic locations,

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<sup>5</sup> Auction 73 is a prime example, where 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. See J. Pierre De Vries and Cheng-Yu Chan, *Edge License Discounts in Cellular Auctions*, *TPRC 2010*, August 15, 2010, available at <http://ssrn.com/abstract=1988429>; see also, Anna-Maria Kovacs, *Regulation in Financial Translation, Neutral Spectrum Auctions: Maximizing Proceeds and Consumer Benefit*, Economic Policy Vignette 2-13-2013 (February 2012), available at: [http://www.gcbpp.org/files/EPV/EPV\\_Kovacs\\_SpectrumAuctions\\_21312.pdf](http://www.gcbpp.org/files/EPV/EPV_Kovacs_SpectrumAuctions_21312.pdf).

<sup>6</sup> We use the word "meaningful" to highlight the fact that the FCC could develop a regional plan that included market variability with limited interference (e.g., dividing the country into three or four regions), but such a plan would be of minimal value in places like the Northeast, where high value Economic Areas such as New York, Philadelphia, Boston, Baltimore and Washington, D.C. would all be in the same region.

depending on the spectrum available.”<sup>7</sup> The driving force behind the *Notice*’s new band plan proposals is thus revealed as a nearly singular desire to permit the repurposing of different amounts of spectrum in different markets.

NAB does not take issue with the notion that – interference concerns aside – some measure of variability could assist the Commission in its ability to conduct a successful action.<sup>8</sup> We therefore understand the interest in attempting to find ways to allow intermittent market variability. But to permit any market variation, the Commission must *first* grapple with the serious engineering challenges that accompany doing so. This proceeding, to date, has failed altogether to acknowledge these patent issues.

NAB and others have raised – both in the comments<sup>9</sup> and during the workshop held just two weeks prior to the *Notice*<sup>10</sup> – the difficulty with broadcasters and wireless carriers operating co- and adjacent channels in neighboring markets. The Commission even has experience with this issue, as it developed rules in the T-Band to handle

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<sup>7</sup> *Notice* at 2.

<sup>8</sup> NAB is particularly sensitive to the “least common denominator” problem identified by Commission staff in the recent public workshop, whereby one market could potentially limit the amount of spectrum the entire country can repurpose for mobile broadband. See Transcript from FCC’s Learn Workshop – 600 MHz Band Plan, GN Docket 12-268 (held May 3, 2013) (600 MHz Workshop Transcript), at 13. In its reply comments, NAB offered an approach that would limit exposure to the least common denominator issue, which would involve a focus on broadcaster repacking first, and then directing resources to the markets where volunteers are needed the most. See Comments of NAB in GN Docket No. 12-268 (filed Jan. 25, 2013), at 45-47; Reply Comments of NAB in GN Docket No. 12-268 (filed Mar. 12, 2013), at 19-21.

<sup>9</sup> See NAB Comments at 39-45; See NAB Reply Comments at 7-19; see also Letter from Rick Kaplan, Executive Vice President, Strategic Planning, NAB, *et al.* to Gary Epstein, Incentive Auction Task Force Chair, *et al.*, GN Docket No. 12-268 (filed May 3, 2013). Verizon Wireless recently made an *ex parte* submission supporting market variability in theory, but noted graphically that “Co-channel Interference due to . . . variability” was still an unresolved issue. See *Ex Parte* Notice of Verizon Wireless in GN Docket No. 12-268 (filed June 11, 2013).

<sup>10</sup> 600 MHz Workshop Transcript at 86-87.

related challenges.<sup>11</sup> Yet the *NPRM* in this proceeding and the *Public Notice* scarcely acknowledge that separation distances – indeed, quite large ones – will be needed to mitigate inherent interference between broadcasters and wireless carriers operating on the same or adjacent channels.

The *Notice's* only fleeting recognition of this separation distance issue demonstrates a failure to grasp its implications or to study it with any rigor. In a footnote, the *Notice* states:

[E]ven assuming that 200 km is the appropriate separation distance [needed to protect wireless and broadcast operations sharing a channel in adjacent markets], we observe that the breadth of the continental United States is more than an order of magnitude larger than those distances, which suggests that variable market clearing might still allow for substantially more spectrum to be made available in the incentive auction.<sup>12</sup>

That statement, while true if one were holding an auction *only* in New York and Los Angeles (thereby not causing any co-channel interference in an adjacent market), makes no sense in the context of a nationwide auction. As NAB detailed in its initial and reply comments, the size of the continental United States is irrelevant when evaluating the effect of leaving channel 47 on the air for television broadcasting in New York (because there were fewer TV broadcast volunteers in New York), but utilizing channels 46 through 48 in Philadelphia or New Haven for wireless operations.<sup>13</sup> The 200 km

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<sup>11</sup> See 47 C.F.R. § 27.60; see also NAB Comments at 40.

<sup>12</sup> *Notice* at 3 n.17. We also note that apparently T-Mobile has visited with Commission officials recently to discuss potential “mitigation strategies necessary to avoid harmful interference,” although the extremely brief *ex parte* filing does not discuss what those strategies are or to what they apply. See *Ex Parte* Notice of T-Mobile USA, Inc. in GN Docket No. 12-268 (filed June 10, 2013).

<sup>13</sup> See NAB Comments at 41-45; NAB Reply Comments at 15-19.

separation distance the *Notice* assumes would virtually wipe out co- and adjacent channel operations in Philadelphia and New Haven and neighboring markets in the surrounding corridor.<sup>14</sup> Moreover, as NAB has demonstrated, given the proposal to use 5 MHz blocks for wireless operations instead of the 6 MHz blocks currently used for TV broadcast spectrum in the 600 MHz band (which NAB does not in principle oppose) and the fact that Economic Areas instead of television Designated Market Areas are likely to be used as geographic building blocks, the interference issue is magnified dramatically. Many more blocks of spectrum will be impacted by any one market that clears less spectrum than its neighbors and therefore continues to have television broadcast operations in what will otherwise become the new nationwide wireless band.<sup>15</sup>

Perhaps the disconnect can best be summed up by the manner in which the *Notice* characterizes the purported trade-off that would be made if market variation was limited or eliminated in the context of the incentive auction. The *Notice* states:

[T]he Down from 51 approaches in the record appear to favor certainty of the operating environment over the utility of providing the maximum amount of spectrum through flexibility to offer a greater quantity of spectrum in geographic areas where more spectrum is available.<sup>16</sup>

The written record does not support such a statement. NAB and others who support the down from 51 approach in the record are not consumed with mere technical “operational certainty,” but rather favor consumers having meaningful experiences on their wireless devices and watching broadcast television without interference.

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<sup>14</sup> In fact, NAB calculates that this required co-channel separation distance will be 225 to 375 km. See NAB Reply Comments at 17-19.

<sup>15</sup> See NAB Comments at 39-45; NAB Reply Comments at 7-19.

<sup>16</sup> *Notice* at 2.



Specifically, those advocating the down from 51 approach are not seeking “certainty” as the *Notice* claims, but rather the best chance to reduce some of the same interference problems the Commission has unfortunately grappled with in the recent past. For example, the issue of interference between the 700 A block wireless licensees and channel 51 broadcast licensees is not merely “operational uncertainty”; it is an issue that to this day essentially prohibits use of at least 12 MHz of prime broadband spectrum nationwide. The issue of interference between LightSquared’s proposed operations in the L-Band and neighboring GPS receivers, as a result of the FCC’s green light, is not merely “operational uncertainty”; but rather, real-world interference that would cause great harm to commercial and military GPS operations if allowed to proceed. Here, too, commenters are not merely concerned about interference around the edges that only the most sensitive device might experience; but rather, interference scenarios that might threaten the auction by leaving licensees and/or consumers with badly degraded spectrum and services and poor device experiences, respectively.

**III. Reversing the Wireless Uplink and Downlink under the “Down from 51 Reversed” Band Plan Variation Does Not Address the Serious Co- and Adjacent Channel Interference Issues, But May Offer Some Benefits if the Commission Employs Variability**

The *Notice* asks for comment on “Down from 51 Reversed” band plan variations.<sup>17</sup> These approaches maintain but move the nationwide uniform downlink band next to the 700 MHz uplink band with the addition of a guard band between the 700 MHz uplink and the 600 MHz downlink. It is envisioned that the uplink remains variable and is moved to the lower portion of the band with a duplex gap between the

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<sup>17</sup> *Notice* at 3-5.

uplink and the downlink. A guard band would also be implemented at the lower end of the 600 MHz wireless band between the uplink band and broadcast spectrum. In this way, the downlink and uplink configuration of the 600 MHz spectrum would be similar to that used for 700 MHz.

At the outset, NAB notes that this approach does nothing to mitigate the co-channel and adjacent channel interference concerns identified above and in NAB's initial, reply and public workshop comments. These concerns are neither addressed nor ameliorated by the new reversed plan and all of our concerns identified above and in our comments apply equally to both.

If, after thoroughly evaluating these serious interference issues, the Commission proceeds with a variable plan, NAB believes that the "reversed" approach would have the benefit of ensuring that no broadcast operation would be located in the duplex gap or "orphaned" between wireless uplink and downlink operations in any market. Such a plan would ensure that broadcast and broadband operations were in separate contiguous spectrum bands in each wireless market. In a variable environment, this approach would help mitigate some intermodulation interference concerns that are inherent in the forward down from 51 variable plan. In addition, interference to broadcast reception would be from lower power wireless handsets rather than high power base stations, which may be easier to mitigate.

The *Notice* also asks about the effects of variable duplex spacing under its down from 51 reversed band plan. While this is primarily a wireless issue, the record is clear that such variable duplex spacing will make wireless handset design more complicated

and expensive, and perhaps limit operability of wireless devices in markets with different duplex spacing.

#### **IV. The Record Is Clear That Placing TV Operations in the Duplex Gap Will Cause Widespread Harmful Interference to TV Viewers and Wireless Consumers**

The *Notice* recognizes that nearly all commenters have significant concerns about allowing high power services to operate in the duplex gap.<sup>18</sup> It queries, however, whether such concerns are dissipated if TV broadcast services are permitted only in those markets where less spectrum is available. The simple answer is no.

The record makes crystal clear that high power TV operation in the duplex gap is problematic for television viewers and wireless operations. Such operation has the potential to cause harmonic and intermodulation interference to both services, and there is no technical justification for suggesting that limiting such operation to only certain markets will eliminate or lessen the interference situation. Put differently, permitting broadcast operations in the duplex gap in some, rather than many or all, markets merely affects the scope of the problem, not whether it exists in the first place. Moreover, receiver manufacturers would need to develop television receivers that receive only certain channels in restricted markets placing unnecessary burdens on broadcasters, consumer electronics equipment manufacturers and, most importantly, viewers and consumers in those markets.

The record demonstrates unequivocally that the Commission should avoid TV operations in the duplex gap in *all* markets. To the extent that the Commission desires additional broadband spectrum in certain constrained markets, NAB's reply comments

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<sup>18</sup> *Notice* at 5.

set forth a plan – based on strategic repacking – for a successful nationwide band plan and auction.<sup>19</sup>

**V. Utilizing TDD Does Not Address Co-Channel and Adjacent Channel Interference in Adjacent Markets and Thus, Like FDD, Does Not Allow for Meaningful Market Variation**

NAB does not take a position with regard to whether a TDD- or FDD-based band plan may have the most flexibility and certainty with regard to wireless operations.

Similar to the *Notice's* down from 51 reversed plan, however, a TDD approach fails to resolve any of the co-channel or adjacent channel issues regarding spectrum variability.

Our analysis suggests that the largest separation distance is required where the TV transmitter interferes with the wireless base station receiver, regardless whether the system uses FDD or TDD technology. This is due to the fact that the base station receiver must be sensitive enough to receive the weak signals from the mobile handset and that its gain antenna is generally mounted on a high site to cover a wide area – both of these conditions making it more vulnerable to interference.<sup>20</sup> In the case of TDD, the same frequencies are used for both uplink and downlink transmissions from both the base station and the handset. In the case of FDD, the spectrum variability is proposed in the uplink band used by the base station receiver. Therefore, to protect TDD operations, the largest separation distances would apply to *all* TDD frequencies. That is, a TDD base station must be located 225 to 375 km from a co-channel DTV station and 100 to 130 km from an adjacent channel DTV station. These are the same distances needed to protect an FDD base station receiver. Accordingly, there is no advantage or disadvantage to a TDD band plan from the perspective of interference or

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<sup>19</sup> NAB Reply Comments at 19-21.

<sup>20</sup> *Id.* at 15-17.

the broadcast community. Both FDD and TDD approaches would require the same nationwide spectrum approach to eliminate harmful interference between wireless and broadcast TV operations.

**VI. A Nationwide Band Plan Is the Only Proven Way to Eliminate Widespread Harmful Interference and to Achieve Congress’s Goals of More Spectrum for Mobile Broadband and Money for Congressional Priorities**

As stated in our comments, NAB continues to believe that a band plan that provides dedicated, nationwide, contiguous spectrum for both broadcast and wireless broadband is the best approach. The incentive auction should be designed to achieve a realistic nationwide band instead of attempting to maximize spectrum in each individual Economic Area, resulting in significant market variations that ultimately will prevent the use of spectrum effectively and efficiently everywhere. Attempting to maximize spectrum recovery through a variable band plan in rural areas also will seriously harm low power television stations and translators that are currently providing essential services to the American people. A nationwide approach best meets the FCC’s stated goals of “utility, certainty, interchangeability, quantity and interoperability.”<sup>21</sup>

**VII. Conclusion**

The Commission needs to address a number of outstanding issues before finalizing its band plan. As noted above, the first and foremost is how to evaluate and address the real-world problem of co- and adjacent channel interference inherent in a variable band plan. The Wireless Bureau, along with the Media Bureau and Office of Engineering and Technology, should immediately turn its attention to this central issue

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<sup>21</sup> Notice at 1.

so that the Commission can move forward in a timely, but more importantly, technically sound fashion.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Rick Kaplan", with a long horizontal line extending to the right.

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