

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554**

In the Matter of)	
)	
Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions)	GN Docket No. 12-268
)	
Office of Engineering and Technology Releases and Seeks Comment on Updated OET-69 Software)	ET Docket No. 13-26
)	
Office of Engineering and Technology Seeks to Supplement the Incentive Auction Proceeding Record Regarding Potential Interference Between Broadcast Television and Wireless Services)	ET Docket No. 14-14
)	

COMMENTS OF CTIA – THE WIRELESS ASSOCIATION®

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TABLE OF CONTENTS

I.	INTRODUCTION AND SUMMARY	1
II.	CTIA SUPPORTS THE COMMISSION’S EFFORTS TO INVESTIGATE AND DEVELOP INTERFERENCE PROTECTIONS BETWEEN BROADCAST AND WIRELESS LICENSEES.....	3
III.	CTIA URGES THE COMMISSION TO ADOPT PROTECTIONS AND PROCEDURES THAT ARE APPROPRIATELY TAILORED AND THAT PROVIDE FLEXIBILITY AND CERTAINTY TO WIRELESS LICENSEES.....	4
A.	The Commission’s Proposed “Zero Percent Threshold” for Harmful Interference to Broadcast Stations is Impractical.....	6
B.	The Commission Should Decline the <i>ISIX Further Notice</i> ’s Proposal to Require Wireless Licensees to Conduct Interference Analysis for Licenses Not Identified as “Impaired” During the Incentive Auction.	7
C.	The Interference Analysis Proposals for Wireless Licenses Are Unnecessarily Burdensome and Restrictive.	9
D.	The Commission’s Rules Must Reflect the Secondary Status of LPTV and TV Translator Stations.	12
IV.	CONCLUSION.....	14

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COMMENTS OF CTIA – THE WIRELESS ASSOCIATION®

I. INTRODUCTION AND SUMMARY

CTIA – The Wireless Association® (“CTIA”) hereby submits these comments in response to the Commission’s Second Report and Order and Further Notice of Proposed Rulemaking (“*ISIX Order*” and/or “*ISIX Further Notice*”) in this proceeding.¹ CTIA commends the Commission for undertaking this important inquiry into potential interference between broadcast and wireless services in the 600 MHz band. By adopting clear, easily-followed procedures for identifying and mitigating interference, the Commission will promote participation in the forward auction and serve the interests of broadcast television incumbents.

¹ *Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions, Office of Engineering and Technology Releases and Seeks Comment on Updated OET-69 Software, Office of Engineering and Technology Seeks to Supplement the Incentive Auction Proceeding Record Regarding Potential Interference Between Broadcast Television and Wireless Services, Second Report and Order and Further Notice of Proposed Rulemaking, FCC 14-157 (Oct. 16, 2014) (“ISIX Order and FNPRM”).*

CTIA is a strong supporter of policies that provide clarity to wireless carriers and broadcasters impacted by the broadcast television incentive auction while maximizing the amount of spectrum made available for new wireless services. For this reason, CTIA supports the Commission's efforts to allow for market variability by investigating interference protections between broadcast and wireless licensees. While the Commission should make every effort to mitigate the amount of variance in the post-auction band plan from market to market, the Commission has correctly sought to avoid the "least common denominator" problem of one particularly constrained market limiting spectrum availability in the rest of the nation. For this reason, CTIA believes that the framework adopted by the Commission in the *ISIX Order* – including its use of *TVStudy* software to calculate interference – will effectively model the complicated interference environment between broadcast and wireless licensees.

In these comments, CTIA provides feedback on the Commission's *ISIX Further Notice* and asks the Commission to take the following steps:

- The Commission should not adopt a "zero percent threshold" for harmful interference from wireless licensees to broadcast television operations, as it is impractical, unprecedented and has the potential to undermine the Auction's ultimate success.
- If the Commission requires a wireless licensee to conduct ongoing interference analyses, it should identify that license as "impaired" during the forward auction. It therefore should reject its proposal to require extensive and ongoing interference analyses by certain "non-impaired" licensees.
- The Commission should reduce regulatory burdens on 600 MHz wireless licensees by applying a less burdensome, "safe harbor" approach to compliance with interference protection requirements and allowing 600 MHz licensees the flexibility to determine the most effective means of compliance. The Commission should reject the unduly burdensome and restrictive approach to interference analysis proposed in the *ISIX Further Notice*.
- The Commission's approach to interference caused by low power television ("LPTV") and TV translator stations must reflect the secondary status of these licensees.

CTIA believes that by taking these steps, the Commission will appropriately balance the need to address interference mitigation with the provision of clarity, certainty, and transparency necessary for bidders in the forward auction.

II. CTIA SUPPORTS THE COMMISSION’S EFFORTS TO INVESTIGATE AND DEVELOP INTERFERENCE PROTECTIONS BETWEEN BROADCAST AND WIRELESS LICENSEES.

CTIA appreciates the Commission’s efforts to address potential co-channel and adjacent-channel interference between television and wireless services in nearby markets as a result of market variability. In general, CTIA believes that market-to-market variation in the 600 MHz band plan should be minimized, but that a certain amount of variation is necessary to serve the critical goal of making more spectrum available for mobile broadband services. For this reason, CTIA supports the Commission’s attempts to accommodate this variation while protecting the interests of both broadcast and wireless licensees.

CTIA continues to believe that a consistent band plan is the most desirable option, and that the Commission should make every effort to clear a consistent amount of spectrum across the country.² For this reason, CTIA supports the Commission’s acknowledgment that a generally consistent band plan has clear benefits. As the Commission observed, limiting the amount of market variation will not only limit the amount of potential inter-service interference, but it will also help licensees achieve economies of scale when deploying their 600 MHz networks.³ This approach will be particularly ideal in the largest markets, where the need for

² See *Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions*, GN Docket No. 12-268, Report and Order, 29 FCC Rcd 6567 ¶ 83 (2014) (“*Incentive Auction Order*”).

³ *Id.*

additional spectrum is greatest. CTIA therefore supports the Commission’s statement that “we will accommodate market variation to a limited extent only.”⁴

It is clear, however, that the accommodation of a limited amount of market variation has strong benefits. A review of the Commission’s interference and domain file data makes clear that there will likely be some market variability due to uncontrollable factors such as international borders, T-band incumbents, and limited broadcaster participation in the reverse auction in certain markets. By modeling the interference environment between broadcast and wireless licensees, the Commission will facilitate this necessary, limited market variation while ensuring that both wireless and broadcast licensees’ investments are protected, and that the best possible service is provided to consumers.

As a general matter, CTIA supports the overall framework developed by the Commission in the *ISIX Order*, including its adoption of a methodology and input values that will allow the Commission to model the complicated interference environment between broadcast and wireless licensees. In particular, CTIA supports the Commission’s decision to use its *TVStudy* software to run the inter-service interference calculations during the incentive auction.⁵ CTIA believes that by following the approach adopted in the *ISIX Order*, the Commission will take an important step toward promoting a harmonious and efficient 600 MHz band plan.

III. CTIA URGES THE COMMISSION TO ADOPT PROTECTIONS AND PROCEDURES THAT ARE APPROPRIATELY TAILORED AND THAT PROVIDE FLEXIBILITY AND CERTAINTY TO WIRELESS LICENSEES.

CTIA believes that a clear framework for interference protection will be necessary to protect the rights of 600 MHz band occupants—both broadcasters and wireless licensees—given

⁴ *Id.*

⁵ *ISIX Order and FNPRM* n. 78.

the Commission's decision to adopt a band plan that accommodates a degree of variability. However, a number of the suggested procedures in the *ISIX Further Notice* are overly complicated and place inappropriate regulatory burdens upon wireless licensees. First, the Commission should adopt an appropriate threshold for interference from wireless operations to television stations. The Commission's proposed "zero percent threshold" for harmful interference to broadcast stations is impractical, overly conservative, and inconsistent with the Commission's past treatment of interference issues. Second, it is essential that the Commission adhere to its principles of transparency and open communication with respect to parties' options in the incentive auction. The proposal to require wireless licensees to conduct interference analysis for licenses not identified as "impaired" during the incentive auction would inject opacity into the auction process that would hamper the Commission's ability to conduct a successful auction and will ultimately harm consumers. Third, the Commission should adopt interference analysis and protection requirements for wireless licensees that are simple, flexible, and easily adhered to. The current interference analysis proposals for wireless licenses are unnecessarily burdensome and restrictive, and will inhibit deployment of services in the 600 MHz band. Fourth, and finally, the interference protection obligations of LPTV and TV translator stations must reflect their secondary status as licensees and be conservatively implemented to ensure interference protection of licensed 600 MHz systems. To ensure protection of primary licensed wireless services, the Commission should adopt and utilize the field strength measure for LPTV and TV translators (the so-called "F(50,10) interference contour")⁶ that has been consistently used by the Commission to model interference from broadcast stations.

⁶ The F(50,10) measure for field strength prediction assumes that an interfering signal will

A. The Commission’s Proposed “Zero Percent Threshold” for Harmful Interference to Broadcast Stations is Impractical.

CTIA opposes the Commission’s proposed “zero percent threshold” for harmful interference to broadcast stations as impractical and inconsistent with the Commission’s past treatment of such matters. Adoption of a zero percent threshold will negatively impact the incentive auction and post-auction wireless deployment. In particular, adopting this standard would necessitate more 600 MHz spectrum being labeled “impaired” in the forward auction than would be otherwise. This is because a 600 MHz licensee will not be permitted to deploy service in an area even where their operations would not interfere with reception of the TV signal by an over the air viewer. This could negatively impact investment by forward auction bidders, which could undermine the auction’s ultimate success. Further, adoption of this threshold has the potential to preclude full use of 600 MHz band spectrum for wireless operations post-auction, as more licenses will have restrictions on where base stations can be deployed. This will make network deployment significantly more challenging and will limit the service available to wireless consumers.

In addition to being overly conservative, the proposed zero percent interference threshold is inconsistent with the Commission’s typical treatment of interference to television broadcast stations. Specifically, the Commission has long applied a 0.5 percent interference threshold to “pairwise” interference between two television stations.⁷ Utilization of this interference threshold has not led to the degradation of over the air viewing of TV signals – and the same level of signals from 600 MHz systems into a TV band would similarly not adversely affect the reception by over the air viewers. The Commission has offered no rationale for why a *de*

be strong enough to interfere in 50 percent of the locations 10 percent of the time.

⁷ See 47 C.F.R. § 73.616(e).

minimis amount of interference from one television station to another is acceptable, but the same amount of interference from a wireless base station or receiver is not. Given that the impact on the broadcast licensee is the same regardless of the source of interference, the Commission has not adequately justified the need for a zero percent interference threshold, and it is not appropriate given the significant burden such a standard would place on new wireless entrants in the 600 MHz band.

CTIA is unaware of any interference threshold within the Commission's rules that would prohibit even a *de minimis* increase in the amount of interference faced by a licensee. Indeed, such a threshold limitation, if applied throughout the 600 MHz band, would very likely preclude unlicensed White Space Devices and wireless microphone usage that the Commission is considering in other incentive auction-related proceedings.⁸ As such, the Commission should reconsider this proposal and determine an appropriate threshold that allows for more flexibility for 600 MHz licensees to manage interference to existing broadcast television receivers rather than an unprecedented and overly conservative zero percent threshold.

B. The Commission Should Decline the *ISIX Further Notice's* Proposal to Require Wireless Licensees to Conduct Interference Analysis for Licenses Not Identified as "Impaired" During the Incentive Auction.

Throughout this and related proceedings, CTIA has stressed the importance of transparency with respect to parties' options in the incentive auction as a critical element in giving bidders the certainty needed to participate with confidence. Consistent with these principles, CTIA urges the Commission to make clear to forward auction bidders if and when a

⁸ See *Amendment of Part 15 of the Commission's Rules for Unlicensed Operation in the Television Bands, Repurposed 600 MHz Band, 600 MHz Guard Bands and Duplex Gap, and Channel 37*, Notice of Proposed Rulemaking, 29 FCC Rcd 12248 (2014); *Promoting Spectrum Access for Wireless Microphone Operations*, Notice of Proposed Rulemaking, 29 FCC Rcd 12343 (2014).

particular license will be “impaired” and subject to additional requirements with respect to interference mitigation and network deployment. In the *ISIX Further Notice*, the Commission argues that new 600 MHz wireless licensees should be required to conduct interference analysis in all cases where operations are within a “culling distance” from a broadcast television station – even where the wireless license in question was not identified as “impaired” during the forward auction.⁹ CTIA strongly opposes this proposal. To maintain the key incentive auction principles of transparency and certainty, the Commission must make clear to forward auction bidders when and if a license will be subject to additional regulatory burdens, and it must do so through a formal designation of that license as “impaired.” To do otherwise would create significant uncertainty for forward auction bidders, and would undermine the Commission’s efforts in this proceeding to clearly communicate to incentive auction stakeholders their respective rights and responsibilities.

To the extent that the Commission asserts that a license offered in the incentive auction could be impaired, this must be fully and transparently disclosed to potential bidders prior to that license being auctioned. However, the Commission’s language in the *ISIX Further Notice* suggests that while such licenses may be impaired by implication, the Commission does not intend to make this clear to potential bidders. This approach would subject wireless licensees to extensive analysis of interference effects to nearby broadcast television stations, *even if the license was not identified as “impaired” during the incentive auction.* Any additional regulatory

⁹ *ISIX Order and FNPRM* ¶ 68. The *ISIX Further Notice* submits that a wireless licensee may not operate base stations within the contour of a co-channel or adjacent-channel DTV station and that before deploying base stations within a specified “culling distance” of nearby broadcast TV stations, wireless licensees must use OET-74 to predict interference to those stations. *Id.* The Commission has proposed that this requirement should apply to all licenses within the “culling distance,” regardless of whether the licensee’s spectrum block was identified as “impaired” in the forward auction process. *Id.*

burdens on a 600 MHz wireless license – including those proposed by the Commission in the *ISIX Further Notice* – should be fully disclosed to potential bidders through a formal designation of that license as “impaired.” To do otherwise would contravene the Commission’s policy of providing clear and timely information to auction bidders regarding the licenses to be auctioned. It would also undermine the broader principles of clarity, transparency, and certainty that are key to the success of this unprecedented auction. CTIA therefore urges the Commission, should it adopt its proposal for a “culling distance,” to fully disclose this requirement during the incentive auction. Any 600 MHz license in the forward auction that would be within the “culling distance” should be disclosed as impaired so that bidders will be provided the information during the auction process of these obligations.¹⁰

C. The Interference Analysis Proposals for Wireless Licenses Are Unnecessarily Burdensome and Restrictive.

The Commission should establish an interference protection framework, suggest “safe harbor” approaches for new 600 MHz licensees, and allow 600 MHz licensees to manage compliance with these requirements instead of mandating a particular analysis and specific, iterative recordkeeping requirements. This will promote a rapid and efficient deployment of wireless services in the 600 MHz band. CTIA opposes the Commission’s proposed interference analysis proposals for wireless licensees as unnecessarily burdensome and restrictive. Adoption

¹⁰ CTIA notes that the methodology proposed by the FCC in the Incentive Auction Comment public notice concerning impairment is still to be determined. *Comment Sought on Competitive Bidding Procedures for Broadcast Incentive Auction 1000, Including Auctions 1001 and 1002*, Public Notice, FCC 14-191, ¶¶ 142-148 (2014). CTIA will comment on that during that proceeding, however, having a range of impairment from zero to fifteen percent would not be an open and transparent disclosure of the effects of Commission actions during the incentive auction – a forward auction license with zero percent impairment is very different than a license with fifteen percent impairment.

of these inflexible procedures will have a negative impact on wireless broadband deployment in the 600 MHz band.

In the *ISIX Further Notice*, the Commission lays out a framework under which each wireless licensee (within the set culling distance from a broadcaster) is required to perform extensive interference analyses prior to deploying base stations. This obligation extends not only to the initial deployment, but is also an ongoing obligation on the wireless licensee. As a result, the wireless licensee's ability to build, maintain, and enhance its network will be greatly impaired. Such a result is plainly not in the public interest. The Commission also proposes that a 600 MHz band wireless licensee perform an analysis of potential co-channel or adjacent-channel interference (using the methodology in OET-74) prior to deploying a base station if that base station is within a set culling distance from the co- or adjacent-channel broadcaster.¹¹ Once this interference analysis is conducted, the licensee's obligation is not complete. In particular, before deploying additional base stations or modifying existing base stations, under the Commission's proposal the wireless licensee would be required to update its interference analysis to ensure that root sum square ("RSS") evaluations are current and accurate.¹² The wireless licensee would be required to retain the latest copy of its interference analysis for each co-channel or adjacent channel Partial Economic Area where any of its base stations fall within the culling distance.¹³ In the event of an interference complaint, the licensee must make this information available to the Commission or a subject television station upon request.¹⁴

¹¹ *Id.* ¶ 72.

¹² *Id.*

¹³ *ISIX Order and FNPRM* ¶ 72.

¹⁴ *Id.*

CTIA strongly opposes the Commission's proposed approach to interference analysis. As an initial matter, this approach ignores both the dynamic nature of wireless network architecture and the explosive growth associated with base station deployments. The Commission should support such dynamism, as it reflects licensees' commitment to innovation and responding to the demands of their customers. However, under the Commission's proposal a 600 MHz licensee within the culling distance of a broadcast television station would be required to constantly perform and store engineering analyses, at great cost to individual wireless licensees.

The Commission's suggested approach is unnecessary and impractical for several reasons. First, the Commission has failed to define the scope of what "making changes to existing base stations" would entail. Many changes to base stations would necessarily decrease any interference effect (or would have no impact on interference) and should not require a new engineering analysis. Second, presuming the "culling distance" impacts a wireless network operator's coverage area, the number of wireless base stations that would require an engineering analysis would be substantial. This challenge will only grow as the wireless architecture moves toward a small cell architecture. Individual engineering analyses based on new or modified base stations would be completely impractical and would serve as an extraordinary hurdle to rapid deployment and modification of wireless network architecture. Given that these network deployments and modifications generally take place in response to consumer demand, the public interest is not served by the adoption of such a burdensome regime. And finally, the ongoing burden to have hundreds, if not thousands of engineering analyses stored and available upon request would be tremendous logistical burden for new 600 MHz licensees.

Instead of adopting the proposals outlined in the *ISIX Further Notice*, the Commission should adopt an alternative approach. In particular, a more appropriate solution would be for the Commission to establish an interference protection framework, suggest “safe harbor” approaches for new 600 MHz licensees, and allow 600 MHz licensees to manage compliance with these requirements. Such an approach is more consistently aligned with past precedent. For example, AWS-1 licensees are required to operate outside of designated “exclusion zones,” but are not required to undertake the complicated and ongoing engineering analysis proposed by the Commission in the *ISIX Further Notice*.¹⁵ Similarly, while in some circumstances 700 MHz band licensees are required to submit engineering studies demonstrating non-interference to television stations, this requirement is much more limited and is not an ongoing obligation on the licensee.¹⁶ Consistent with this past practice, the Commission should apply a less burdensome, “bright-line” approach to compliance with interference protection requirements and allow 600 MHz licensees the flexibility to determine the most effective approach for compliance instead of mandating an overly rigorous and unnecessary approach as proposed.

D. The Commission’s Rules Must Reflect the Secondary Status of LPTV and TV Translator Stations.

To the extent the Commission tailors its inter-service interference methodology with respect to interference to 600 MHz band wireless operations from LPTV and TV translator stations, such alterations must reflect the secondary status of these licensees. Because these stations are licensed on a secondary, non-interference basis, *any* interference to primary services

¹⁵ 47 C.F.R. § 27.1134.

¹⁶ 47 C.F.R. § 27.60(b)(1)(iii) (providing that licensees of stations operating within the limits of Section 27.50 of the rules may satisfy the TV/DTV protection requirements by taking one of four steps, one of which is the submission of an engineering study).

(including 600 MHz mobile wireless operations) is prohibited under the Commission's rules.¹⁷ To ensure protection of primary licensed wireless services, the Commission should adopt and utilize the field strength measure for LPTV and TV translators (the so-called "F(50,10) interference contour") that has consistently been used by the Commission to model interference from broadcast stations. As the Commission explained in the *ISIX Order*, the F(50,10) measure for field strength prediction assumes that an interfering signal will be strong enough to interfere in 50 percent of the locations 10 percent of the time.¹⁸ This measure is more conservative than the F(50,50) statistical measure adopted by the Commission to predict interference from full power and Class A DTV transmitters to wireless base stations. This is because, as the Commission notes, under the F(50,10) statistical measure the strength of the interfering signal will be less than predicted 90 percent of the time.¹⁹

A conservative approach to interference prediction is appropriate in light of the secondary nature of LPTV and TV translator operations. Use of the F(50,50) field strength contours to model interference is inconsistent with the protections provided by the Commission to full power broadcast television stations from LPTV and translator operations. While the FCC has adopted use of the F(50,50) statistical measure during the incentive auction to model potential effects of TV stations to wireless 600 MHz licensees,²⁰ the secondary nature of LPTV and TV translator

¹⁷ See e.g., 47 C.F.R. § 74.703.

¹⁸ *ISIX Order and FNPRM* ¶ 37.

¹⁹ *Id.* n. 132. To better explain this difference, the F(50,50) contour will be much smaller than the F(50,10) contour. By modeling interference protections from the smaller F(50,50) contour, the FCC will be ignoring the significant potential from interference that could be predicted by the F(50,10) contour that has traditionally been used in the television bands to determine interference from television stations. See e.g., 47 C.F.R. § 73.623(c).

²⁰ *ISIX Order and FNPRM* ¶ 37.

stations requires a more conservative approach post-auction to protect licensed 600 MHz mobile broadband operations. CTIA therefore respectfully urges the Commission to rely upon the F(50,10) statistical measure post-auction when modeling interference from secondary LPTV and TV translator station interference to licensed 600 MHz systems.

IV. CONCLUSION

CTIA is pleased to support the Commission's efforts to develop a methodology to evaluate inter-service interference, and believes that the approach outlined in these comments will enable the Commission to increase the amount of spectrum made available for mobile broadband. As explained, CTIA is concerned that a number of the Commission's proposed rules are overly complicated and place inappropriate regulatory burdens upon wireless licensees. By adopting an approach to inter-service interference that is transparent, easily understood, and pragmatic, the Commission will help to ensure success in both the incentive auction and the post-auction frequency environment in the 600 MHz band.

Respectfully submitted,

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