

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

In the Matter of)	
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Amendment of Part 15 of the Commission’s Rules for Unlicensed Operations in the Television Bands, Repurposed 600 MHz Band, 600 MHz Guard Bands and Duplex Gap, and Channel 37)	ET Docket No. 14-165
)	
Amendment of Part 74 of the Commission’s Rules for Low Power Auxiliary Stations in the Repurposed 600 MHz Band and 600 MHz Duplex Gap)	
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Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions)	GN Docket No. 12-268
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COMMENTS OF MOBILE FUTURE

Mobile Future submits these comments in response to the Federal Communications Commission’s Notice of Proposed Rulemaking proposing rules for unlicensed operation of white space devices and wireless microphones in the reconstituted TV bands and the repurposed 600 MHz Band after the incentive auction.¹ The 600 MHz incentive auction is a core component of the Commission’s efforts to ease the spectrum crunch. For the auction to be successful and deliver the maximum amount of spectrum to meet the growing needs of mobile consumers, the Commission must protect licensed operations from unlicensed services. Carriers’ purchase of licensed blocks will drive the auction, determining the amount of spectrum that is repurposed for

¹ *Amendment of Part 15 of the Commission’s Rules for Unlicensed Operations in the Television Bands, Repurposed 600 MHz Band, 60 MHz Guard Bands and Duplex, and Channel 37; Amendment of Part 74 of the Commission’s Rules for Low Power Auxiliary Stations in the Repurposed 600 MHz Band and 600 MHz Duplex Gap; Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions*, ET Docket No. 14-165, GN Docket No. 12-268, Notice of Proposed Rulemaking, 29 FCC Rcd 12248 (2014) (“Unlicensed NPRM”).

mobile broadband use. But carriers may be reluctant to purchase, and certainly will not pay top dollar for, licenses impaired by unlicensed operations. Moreover, the Spectrum Act requires the FCC to protect licensed operations in the 600 MHz band from harmful interference by unlicensed services. To ensure that spectrum reclaimed from the incentive auction can help meet the nation's growing mobile broadband needs, the Commission must fulfill its statutory duty to adopt rules that protect licensed operations and mobile consumers from harmful interference. The FCC's rules also should promote the smooth and timely transition of unlicensed devices out of the repurposed 600 MHz Band.

I. The Incentive Auction Is a Core Component of the Commission's Efforts to Ease the Spectrum Crunch

The incentive auction is a core component of the Commission's efforts to ease the spectrum crunch and the FCC must ensure that the rules adopted in this proceeding facilitate the success of the auction. Consumer demand for mobile broadband continues to increase at a rapid rate. 45 million Americans consumers use mobile phones as their primary Internet access device.² The average user spends 2.5 hours per day on the Internet via a mobile phone – and usage is continuing to rise.³ Mobile data traffic is expected to grow at a compound annual rate of 47 percent from 2014 to 2019, reaching 3.6 exabytes per month.⁴

This consumer demand generates a critical need for more spectrum resources. Wireless service providers are working to keep up, as evidenced by robust spectrum auction participation

² Stephen J. Blumberg and Julian V. Luke, *Wireless Substitution: Early Release of Estimates from the Health Interview Survey*, January-June 2013 (Dec. 20, 2013), available at <http://www.cdc.gov/nchs/data/nhis/earlyrelease/wireless201312.pdf>.

³ We Are Social, *Digital Social & Mobile in 2015*, (Jan. 2015) available at <http://www.slideshare.net/fullscreen/wearesocialsg/digital-social-mobile-in-2015/8>.

⁴ Cisco Visual Networking Index: Global Mobile Data Traffic Forecast Update, 2014-2019, (Feb. 3, 2015), available at http://www.cisco.com/c/dam/assets/sol/sp/vni/forecast_highlights_mobile/index.html#~Country.

to date: through 2014, carriers paid \$53 billion to the United States Treasury to acquire spectrum in FCC auctions.⁵ And, aggregate bidding in the recently closed AWS-3 auction reached nearly \$44.9 billion,⁶ more than four times the reserve price and nearly three times early estimates of the auction's final take.⁷ The AWS-3 auction results demonstrate that wireless carriers need more licensed spectrum to meet consumer's ever-increasing demand for mobile broadband, and the 600 MHz spectrum repurposed in the incentive auction will be a key input in meeting that demand. Therefore, it is critical that the rules adopted both in the incentive auction proceeding and in related proceedings, such as this one, enable the auction to succeed.

II. The Spectrum Act and the Unique Characteristics of the Incentive Auction Require that the Commission's Part 15 Rules Protect Licensed Operations in the 600 MHz Band from Harmful Interference

The Spectrum Act and the unique design of the incentive auction require that the Commission protect licensed operations in the 600 MHz Band from harmful interference from unlicensed operations. The Spectrum Act permits the Commission to establish guard bands that are only as large as necessary to prevent harmful interference between licensed services outside of the guard bands.⁸ The Spectrum Act also permits the Commission to allow unlicensed use of the guard bands, but prohibits the FCC from permitting any use of a guard band that would cause

⁵ Statement of Chairman Tom Wheeler, Federal Communications Commission, Hearing on the FCC's Fiscal 2015 Budget Request Before the Subcommittee on Financial Services and General Government Committee on Appropriations, U.S. House of Representatives, March 25, 2014, *available at* <http://www.fcc.gov/document/chairman-tom-wheeler-testimony-fccs-fiscal-2015-budget-request>.

⁶ FCC, Auction 97 Results, Licenses for Round 341, <https://auctionbidding.fcc.gov/auction/index.htm?CFID=5582224&CFTOKEN=89733543&jsessionid=Gx49JKsJQJpb46LQLyDWS7DR4wQhC4Hd16PVHmPQ1mBhhXvTCMJs!819142837!-1117002762!14225684897731117002762!1422449625050> (last visited Jan. 29, 2015).

⁷ John Eggerton, *AWS-3 Auction Slows*, *Broadcasting & Cable* (Jan. 6, 2015), <http://www.broadcastingcable.com/news/washington/aws-3-auction-slows/136773>.

⁸ Middle Class Tax Relief and Job Creation Act of 2012, Pub L. No. 112-96, §§ 6407(a), (b) 126 Stat. 156 (2012) ("Spectrum Act").

harmful interference to licensed services.⁹ This is consistent with FCC rules that have been in place for decades establishing that unlicensed operations are secondary and may not cause harmful interference to licensed operations; the FCC’s rules should remain consistent with those well-established policies.

Protecting licensed services outside of the guard bands from harmful interference is critical to the design of the incentive auction. The incentive auction is unique in that bidders in the forward auction will bid on generic categories of spectrum licenses and will be assigned frequency-specific licenses in a subsequent assignment round. It is therefore imperative that all spectrum blocks in the forward auction be fully and uniformly protected from harmful interference from unlicensed uses in the guard bands, including the duplex gap. Some licenses offered to carriers will already be impaired due to broadcast TV stations operating on the same or adjacent frequencies in nearby markets.¹⁰ Introducing further impairments from adjacent unlicensed operations to the license blocks offered in the forward auction would reduce the value of these licenses, undercut the Commission’s goal of offering essentially fungible licenses within each license category in the forward auction, and add uncertainty to the clock rounds of the forward auction, all of which could deflate auction proceeds. The Commission should proceed carefully to avoid rules that will limit the usefulness or value of any particular block of spectrum – in particular those adjacent to the guard bands.

⁹ Spectrum Act §§ 6407(c), (e).

¹⁰ The FCC will consider licenses to be “impaired” in the incentive auction only if the impairment results from potential interference from licensed TV broadcast stations operating in the 600 MHz band due to the proposed market variation in the 600 MHz band plan. The FCC will not consider licenses to be “impaired” for purposes of setting forward auction prices if they are subject to harmful interference from unlicensed operations.

III. The Commission Should Adopt Several of the NPRM's Proposals to Provide Meaningful Interference Protection for Licensed Services

The Commission should adopt rules that protect licensed operations from harmful interference from unlicensed white space devices and unlicensed wireless microphones, both during and after the transition period.

A. White Space Devices Operating in the 600 MHz Guard Bands and in the Repurposed 600 MHz Band Should Not Cause Harmful Interference to Licensed Operations

The Commission should take steps to ensure that white space devices operating in the 600 MHz guard bands do not cause harmful interference to licensed services. First, administrators should update the white spaces database when carriers begin operating on particular frequencies in particular PEAs to inform unlicensed operators that white spaces devices may no longer operate on that spectrum.¹¹ The Commission should also establish rules for white space devices that address operation on a channel immediately adjacent to wireless downlink services, including by limiting the power of white space devices in the guard bands and duplex gap and by requiring a buffer between the edge of the channel used by the white space device and wireless downlink services sufficient to protect wireless downlink services.¹²

Additionally, the Commission must protect licensed services in the 600 MHz band from white space device interference during the transition period.¹³ Because unlicensed operations will be permitted to continue in the repurposed 600 MHz band until a licensee “commences operations,” the Commission must adopt a definition of “commences operations” that protects licensees from harmful interference during the initial and testing phases of operations.

¹¹ Unlicensed NPRM, 29 FCC Rcd at 12272, ¶ 79.

¹² Unlicensed NPRM, 29 FCC Rcd at 12273, ¶ 81.

¹³ Unlicensed NPRM, 29 FCC Rcd at 12287, ¶ 129.

Licensed operations must also be protected from harmful interference in the event of market variation in the band plan. If the final band plan includes market variation, some spectrum may be assigned for broadcasting in some areas and for licensed wireless services in others.¹⁴ In other words, both white space devices and licensed wireless services could potentially operate on the same frequencies in adjacent areas. The Commission should develop appropriate minimum separation distances between unlicensed and licensed operations to be used by the white space databases to ensure that unlicensed operations no longer occur on a channel in an area in which a 600 MHz licensee has commenced operations.

B. Unlicensed Wireless Microphones Operating in the 600 MHz Guard Bands and in the Repurposed 600 MHz Bands Should Not Cause Harmful Interference to Licensed Operations

Under the Spectrum Act, licensed downlink services are entitled to protection from harmful interference from adjacent unlicensed wireless microphones operations. Accordingly, the Commission should adopt safeguards to ensure that licensed services may operate free from interference, including limiting the power levels of unlicensed wireless microphones and requiring sufficient frequency buffers between the two services.

The Spectrum Act requires that unlicensed wireless microphones operating in the guard bands access a database to ensure that they do not cause harmful interference to licensed services.¹⁵ Manually checking a database through a laptop or similar device is not sufficient to meet the requirements of the Act. The Act prohibits the Commission from allowing unlicensed use to cause harmful interference to licensed operations,¹⁶ and depending on users to manually

¹⁴ Unlicensed NPRM, 29 FCC Rcd at 12287, ¶ 130.

¹⁵ Spectrum Act § 6407(d). *See also* Unlicensed NPRM, 12297, ¶ 163. This requirement is necessary both during the transition period and after, as the frequency and size of the guard band separating TV and wireless downlink spectrum may differ due to market variation.

¹⁶ Spectrum Act § 6407(e).

check a database is not a reliable method of protecting against interference. Instead, the mechanism for these unlicensed devices to check the databases must be automated to ensure accuracy and consistent compliance.

Unlicensed wireless microphones must also be required to check a database to ensure they are outside a wireless licensee's service area during the post-auction transition period. Wireless microphones will be permitted to operate in the 600 MHz band during the post-auction transition period unless they cause harmful interference to any 600 MHz licensee's operations. As highlighted in the NPRM, wireless microphones could cause harmful interference to 600 MHz band operations, even though they do not receive any interference themselves.¹⁷ Therefore, wireless microphone operators may not be aware they are causing harmful interference and parties receiving interference may not be able to identify the source of the interference. The Commission should establish minimum separation distances from a co-channel wireless licensee's service area and require wireless microphone operators to check the database (as described above) to prevent harmful interference from wireless microphones operating in the 600 MHz band during the post-auction transition phase. Further, the Commission should establish minimum frequency separation distances from the edges of co-channel wireless channels within the guard bands and duplex gap bands.

IV. The Commission Should Take All Steps Necessary to Ensure a Smooth and Timely Transition of Wireless Microphones Out of the Repurposed 600 MHz Band¹⁸

The Commission should take several steps to ensure a smooth transition of wireless microphones out of the repurposed 600 MHz band. First, the FCC should stop accepting

¹⁷ Unlicensed NPRM, 29 FCC Rcd at 12298, ¶ 167.

¹⁸ The proposals set forth in this Section IV are consistent with Mobile Future's proposals regarding the transition of licensed wireless microphones, being submitted today in GN Docket Nos. 14-166 and 12-268.

applications for certification of new Part 15 wireless microphones that operate in the repurposed 600 MHz Band immediately following the release of the *Channel Reassignment PN*. There is no justification for continuing to accept certification applications once the incentive auction is complete and the obligation for wireless microphone users to transition out of the band is certain.

The Commission should also prohibit the manufacture, import, sale, offer for sale, and shipment of wireless microphones that operate in the repurposed 600 MHz band six months after release of the *Channel Reassignment PN*.¹⁹ Any longer time frame may cause harmful interference to licensed wireless operations and ultimately adversely affect consumers.

Additionally, the Commission should require wireless microphone manufacturers to educate consumers on the steps necessary to prevent interference to wireless operations in the repurposed 600 MHz band. Thorough and prompt consumer education requirements will reduce the likelihood that wireless microphone users continue operating in the repurposed 600 MHz band after the conclusion of the post-auction transition period and the likelihood that such operations cause harmful interference to wireless operations.

Finally, the Commission should require that wireless microphones that are certified to operate in any portion of the repurposed 600 MHz band are no longer marketed or operated after the specified cutoff dates, even if the microphones could be tuned to operate outside the 600 MHz band.²⁰ To ensure that both the Commission and wireless microphone users can distinguish between wireless microphones which may be legally operated after that transition and those that may not, microphones that operate only in the guard bands and duplex gap – and not the repurposed 600 MHz spectrum – should be required to obtain separate FCC identification numbers. This requirement will assist the FCC in enforcing the prohibition on operating wireless

¹⁹ Unlicensed NPRM, 29 FCC Rcd at 12311, ¶ 207.

²⁰ Unlicensed NPRM, 29 FCC Rcd at 12311, ¶ 208.

microphones in the repurposed 600 MHz spectrum, and will therefore decrease the likelihood that wireless consumers receive harmful interference from unlicensed wireless microphone use.

V. Conclusion

The Commission should adopt rules in this proceeding that fully protect licensed operations in the 600 MHz band from harmful interference caused by unlicensed operations.

Respectfully Submitted,

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