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July 15, 2015

EX PARTE VIA ECFS

Ms. Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

Re: Expanding the Economic and Innovation Opportunities of Spectrum through Incentive Auctions, GN Docket No. 12-268, AU Docket No. 14-252.

Dear Ms. Dortch:

On July 13, 2015, the undersigned, representing AT&T, met separately with Erin McGrath, from the office of Commissioner Michael O’Rielly and Matthew Berry and Brendan Carr, from the office of Commissioner Agit Pai. I also spoke by phone with Howard Symons of the Auction Task Force. On July 14, I met with Valerie Glasso, from the office of Commissioner Jessica Rosenworcel. In each of these conversations, I discussed AT&T’s position on Staff recommendations regarding the placement of broadcast stations in the 600 MHz wireless band—if they cannot otherwise be repacked—and the overall level of impairment that will be permitted in the 600 MHz wireless band regardless of where in-band broadcasters are placed.

AT&T has previously noted its concern with the June 3, 2015 simulation, which appears to contemplate a high level of in-band impairments from TV broadcasters being repacked into the commercial mobile 600 MHz band.¹ On July 10, 2015, staff released a

¹ Letter from Joan Marsh (AT&T) to Marlene H. Dortch (FCC), *Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions*, GN Docket No. 12-268, *Competitive Bidding Procedures for Broadcast Incentive Auction 1000, Including Auctions 1001 and 1002*, AU Docket No. 14-252 (July 1, 2015), available at <http://apps.fcc.gov/ecfs/document/view?id=60001111865>; Letter from Joan Marsh (AT&T) to Marlene H. Dortch (FCC), *Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions*, GN Docket No. 12-268, *Competitive Bidding Procedures for Broadcast Incentive Auction 1000, Including Auctions 1001 and 1002*, AU Docket No. 14-252 (July 6, 2015), available at <http://apps.fcc.gov/ecfs/document/view?id=60001113457>; Letter from Joan Marsh (AT&T) to Marlene H. Dortch (FCC), *Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions*, GN Docket No. 12-268, *Competitive Bidding Procedures for Broadcast Incentive Auction 1000, Including Auctions 1001 and 1002*, AU Docket No. 14-252 (July 10, 2015), available at <http://apps.fcc.gov/ecfs/document/view?id=60001114736>. See also Public Notice, *Incentive Auction Task Force Releases Initial Clearing Target Optimization Simulations*, AU Docket No. 14-252,

“Summary of Data PN” showing how many stations might be repacked into the 600 MHz band under several simulations.² These latest results confirm that the staff is contemplating placing numerous broadcasters into the 600 MHz band across the downlinks, uplinks and guard bands (including the duplex gap) in a patchwork pattern that will seriously impair the 600 MHz band and likely will have significant impacts on valuations and utilization of the band.

The “Summary of Data PN” document indicates that the staff simulated three broadcaster participation scenarios, and picked the “highest achievable” clearing target for each scenario under the “one equivalent block impairment threshold.” The document apparently was intended to illustrate the difference in nationwide license impairments if the repacking plan prioritizes preserving the duplex gap for unlicensed use over preserving licensed blocks for commercial mobile use. In this respect, the results are not surprising. Prioritizing unlicensed over licensed use by “protecting” the duplex gap would result in higher percentages of nationwide impairment. Moreover, the actual impairment percentages would be even *higher* if ISIX data from Mexican broadcasters were included.

The larger and more important point in the PN data, however, is that the level of impairment the staff proposed to inflict on the 600 MHz band at the “highest achievable” clearing target in each scenario would significantly reduce the amount of usable spectrum offered in the auction, impacting both valuations in the auction and the utilization of the band going forward. The central problem is that the focus on the “percent impaired” nationwide—even if it were not artificially understated by assuming away impairments from Mexico—simply does not accurately represent the degree to which the placement of TV stations in the 600 MHz band will diminish the utility of the band.

First, as the record makes clear, putting high powered TV broadcast stations into the downlink band in 600 MHz presents very serious obstacles for the wireless industry’s deployment of the band. In order to achieve interoperability across the band, the end user devices would have to have a front end capable of receiving in Blocks A-G, presuming an 84 MHz clearing where 7 blocks of spectrum would be cleared in most markets. Thus, the front end of the device would by necessity be open to receiving high power, in-band transmissions from television broadcasters.

As a practical matter, interoperability would likely to be achieved by using at least two duplexers in devices, each of 25 MHz or less. While such an approach might mitigate some of the impairment challenges, it would still result in substantial in-band impairments where even a single broadcaster is repacked into the wireless downlink. In other words, a single TV station in the downlink would likely make 3-4 blocks of the 7

GN Docket No. 12-268 (June 3, 2015), available at https://apps.fcc.gov/edocs_public/attachmatch/DA-15-606A1.pdf.

² Letter from Gary Epstein (FCC) to Marlene H. Dortch (FCC), *Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions*, GN Docket No. 12-268, *Policies Regarding Mobile Spectrum Holdings*, WT Docket No. 12-269, *Competitive Bidding Procedures for Broadcast Incentive Auction 1000, Including Auctions 1001 and 1002*, AU Docket No. 14-252, at attachment (July 10, 2015) (“July 10 Public Notice”), available at <http://apps.fcc.gov/ecfs/comment/view?id=60001092731>.

unusable in the TV station's broadcast area.

Second, the staff's 84 MHz clearing simulation would place, in one market or another, at least one TV broadcaster on each of 5 different channels that overlap the downlink band, as well as channel 45, which is less than 5 MHz from the G block. This relegates at least 7 other markets to operating on—at most—3-4 blocks out of 7. Depending on the reach of the stations in Syracuse/Buffalo, and Wilkes-Barre/Scranton/Harrisburg, the band might be unavailable completely over portions of New York and Pennsylvania. Indeed, the simulation data shows impairments in both the NY and Philadelphia PEAs that are likely caused by these adjacent markets. Of course, a carrier could simply operate on bands other than 600 MHz in the impaired markets. This option would avoid the problem of trying to use multiple duplexers to utilize the “clean” blocks in the impaired markets. This also would likely reduce auction revenues, as a carrier might reasonably determine to avoid impaired markets altogether, given the difficulties that would be encountered in trying to utilize them.

Different issues are created if the FCC puts TV broadcasters in the uplink portion of the 600 MHz band. Because base station receivers are more sensitive, the geographic area (and hence the weighted pops) impaired by an in-band TV broadcaster would appear to be greater than it would if the broadcaster were placed in the downlink (as the ISIX calculations in Figures 1 and 2 attached show), but the mitigation options are better. Use of the co-channel blocks in the affected area would still be impossible, but it might be possible to develop filters for base stations that would allow carriers to use blocks that are not co-channel to the TV broadcaster. In fact, because the mitigation options are better, ISIX *overstates* the impact of placing TV stations in the uplink even as it understates downlink impairments.

Notwithstanding the record on these issues, in the staff's simulation, the broadcasters are put primarily in the downlink band, which has the effect of lowering the percentage of weighted pops in the impairment analysis.³ This ignores the substantial harm to the band that placement in the downlink will cause. Moreover, there is no engineering record support for prioritizing the placement of TV stations in the downlink over uplink.

As a final matter, if the staff puts the broadcasters in the duplex gap, this typically would cause the least impairment under ISIX, because the bulk of the harm would fall into spectrum that is guard band for the 600 MHz band. To be sure, this would reduce the unoccupied guard band spectrum for low powered unlicensed uses, but it would result in clearing more usable spectrum for licensed commercial mobile services—which, of course, is Congress' intent. If it were necessary to put a broadcaster in the 600 MHz band, putting the TV broadcaster at the upper end of the duplex gap—channel 46 in the 84 MHz clearing scenario—would carry the same sort of issues that placing spectrum in the uplink would carry, but would impair fewer blocks in the uplink than placing a station

³ It is possible that the apparent preference for placing TV in the downlink is purely a product of the available allotments in the repacking process, rather than a priority on downlink placements over uplink—the Public Notice is not clear on this point.

entirely in the uplink band. And so long as the station was placed at least 5 MHz away from the downlink band, placing the station in the duplex gap should not impair the downlink (although there likely would be some degradation in the downlink block adjacent to the duplex gap—10 MHz separation is necessary to eliminate it entirely).⁴ Placing a station in the bottom portion of the duplex gap (channel 44, or even 45, as this is less than 5 MHz from the downlink in the 84 MHz scenario) would raise the same issues as placing a station in the downlink band.

The main problems with the simulation scenarios are that they appear to underestimate the profound damage to the 600 MHz wireless band (and hence to valuation and utilization) that would result from placing multiple US TV broadcasters into a band allocated for commercial mobile broadband use.⁵ By choosing to measure impairment on a MHz-pops basis, the analysis does not accurately quantify the collateral harm to the band associated with various repacking options, or the relative unavailability of mitigation options. The staff's simulation correctly indicates that prioritizing the preservation of the duplex gap for unlicensed use would certainly and substantially reduce the usable spectrum that could be offered in the auction. It fails, however, to fully quantify the challenges that placing multiple TV stations into the 600 MHz band would create for deployment of the band.

The first priority should be *don't impair the 600 MHz band by repacking US broadcasters in the band*. The staff should clearly re-evaluate the “one equivalent block” approach—it appears all but certain to result in far too many TV broadcasters being repacked into the band. And these impairments are likely to be permanent and create serious deployment challenges for the wireless industry that would persist for years to come.

The 700 MHz band still has not overcome the problems that arose from having channel 51 broadcasters merely *adjacent* to the band. Here the Commission proposes to put TV broadcasters *into the 600 MHz band, not merely adjacent to it*. If it becomes necessary to repack broadcasters in the 600 MHz band, the FCC should commit to keeping the aggregate impairment threshold at no more than the quantifiable border impairments at the time of auction plus an incremental 3% percent. If the border impairments are largely resolved before auction through cross-border negotiations, then the overall aggregate level should be closer to 3% than 14% (for an 84 MHz band plan). And the placement of any TV broadcasters that might need to be repacked into the band should be prioritized to put them first in the upper duplex gap, then uplink, lower duplex

⁴ As AT&T and others have shown, a minimum of 10 MHz of separation is required between a TV broadcast station and the downlink in order to fully protect device receivers from degradation. The ISIX model only accounts for impacts in the 5 MHz on either side of the broadcast channel, but it should be modified to consider interference impacts out to 10 MHz on either side of the band edge. For example, placing a TV station in channel 45 in Los Angeles, in an 84 MHz clearing scenario would result in an impairment of 1.44 % in the ISIX model, largely missing the impact on the G Block downlink. If ISIX considered interference effects out to 10 MHz, the impact from placing a broadcaster in channel 45 under the same circumstances would be 2.99 %.

⁵ Also, the record certainly would not support a decision to sprinkle TV stations in various markets across the duplex gap, uplink *and* downlink as the simulation would seem to do.

gap, and lastly, the downlink.

During the course of these discussions, I referred to the Simulation Data Public Notice released by the FCC on July 10, 2015;⁶ Clearing Target Optimization Simulations released by the FCC on June 3, 2015,⁷ the Cross-Border Study filed by AT&T on April 14, 2015,⁸ the two charts attached to this ex parte and the Repacking Study conducted by Michael Kearns, filed by AT&T on February 20, 2015.⁹

In accordance with the Commission's rules, this letter is being filed electronically with the Secretary for inclusion in the public record.

Sincerely,

A handwritten signature in black ink, appearing to read 'Joan Marsh', with a long horizontal line extending to the right.

Joan Marsh

cc: Erin McGrath
Michael O'Rielly
Matthew Berry
Brendan Carr
Agit Pai
Howard Symons
Valerie Glasso
Jessica Rosenworcel

⁶ July 10 Public Notice.

⁷ Public Notice, *Incentive Auction Task Force Releases Initial Clearing Target Optimization Simulations*, AU Docket No. 14-252, GN Docket No. 12-268 (June 3, 2015), available at https://apps.fcc.gov/edocs_public/attachmatch/DA-15-606A1.pdf.

⁸ Letter from Michael P. Goggin (AT&T) to Marlene H. Dortch (FCC), *Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions*, GN Docket No. 12-268 (April 14, 2015), available at <http://apps.fcc.gov/ecfs/document/view?id=60001043518>.

⁹ Philip A. Haile, Michael Kearns, Lili Dworkin, *Comments on the FCC's Current Incentive Auction Design Proposals*, at 21-44 (Feb. 20, 2015), attached to Comments of AT&T, *Competitive Bidding Procedures for Broadcast Incentive Auction 1000, Including Auctions 1001 and 1002*, AU Docket No. 14-252 & GN Docket No. 12-268, (Feb. 20, 2015), available at <http://apps.fcc.gov/ecfs/document/view?id=60001040448>.

ATTACHMENT

84 MHz Plan	37	DOWNLINK										UPLINK						
		GB	A	B	C	D	E	F	G	GB	A	B	C	D	E	F	G	
TV CH	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51			
NY	37	3.60%	5.57%	8.60%	8.60%	7.13%	5.63%	1.94%	1.52%	6.72%	9.42%	9.25%	9.27%	9.25%	7.42%			
LA	37	2.99%	4.51%	7.46%	7.46%	5.98%	4.51%	1.52%	1.44%	4.39%	5.86%	5.83%	5.83%	5.83%	4.39%			
CHI	37	1.52%	2.35%	3.83%	3.83%	3.03%	2.35%	0.84%	0.67%	2.30%	3.12%	2.98%	2.98%	2.98%	2.32%			

Figure 1: Percentage Impairments from TV Broadcast Impairments in Major Markets

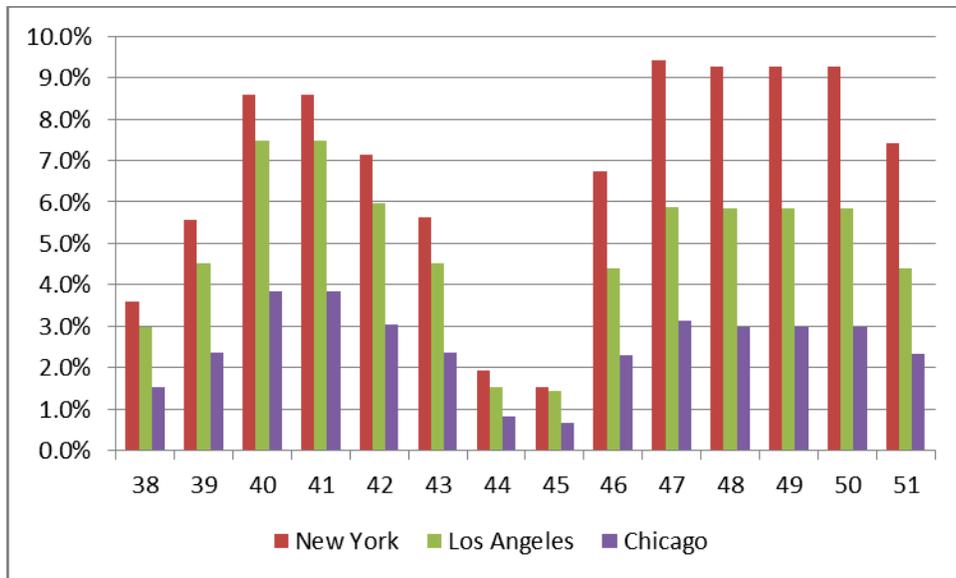


Figure 2: Relative Impairments from Broadcasters by Channel in Major Markets