

**Before the
Federal Communications Commission
Washington, D.C. 20554**

In the Matter of)	
)	
Competitive Bidding Procedures for Broadcast Incentive Auction 1000, Including Auctions 1001 and 1002)	AU Docket No. 14-252
)	
Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions)	GN Docket No. 12-268
)	

REPLY COMMENTS OF AT&T

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REPLY COMMENTS OF AT&T

AT&T Services Inc., on behalf of itself and its affiliates (collectively “AT&T”), respectfully submits these reply comments in response to the Commission’s December 17, 2014 Public Notice seeking comment on competitive bidding procedures for the broadcast incentive auction.¹

INTRODUCTION AND SUMMARY

There is a striking consensus, cutting across all stakeholders, that the placement of TV stations in the 600 MHz LTE band will spread impairment throughout the national band plan, with impairments especially likely (and especially extensive) in the largest markets that are key to the success of the auction. The commenters broadly recognize that such impairments will reduce the quality, usefulness, and quantity of the auctioned spectrum. First, as many commenters acknowledge, each TV station in the 600 MHz band will directly render numerous other spectrum blocks either unavailable for auction at all or subject to substantial impairment,

¹ Public Notice, Comment Sought on Competitive Bidding Procedures for Broadcast Incentive Auction 1000, Including Auctions 1001 and 1002, AU Docket No. 14-252, GN Docket No. 12-268, FCC 14-191 (rel. Dec. 17, 2014) (“*Notice*”).

both in the same and adjacent PEAs. The commenters show that this will be true whether the TV station is placed in the uplink or downlink, although as CTIA, NAB and others confirm, TV stations in the uplink will have the widest geographic impact, impairing multiple spectrum blocks for hundreds of kilometers.

Second, the commenters recognize that bidders in the forward clock auction will have no way of knowing *how* impaired the spectrum they may win will be, or in what way it will be impaired, and therefore bidders will be forced to reduce their bids to account for the possibility that they will end up with the more impaired spectrum – which, in turn, will further reduce the amount of spectrum that the Commission can clear in this auction. Moreover, as Sprint and others show, bidders already understand that the Commission’s methodology significantly understates the true level of impairment in various ways, and thus bidders will further depress their bids to account for these uncertainties.

In short, a central assumption underlying the forward clock auction—that each spectrum block will be reasonably generic in quality—has been lost. The commenters, in grappling with these issues, broadly agree that the Commission’s proposed fixes will not do the job (and in fact will likely make things worse) and that, in reality, there are really only two ways to restore the prerequisites for a successful auction: either (1) get rid of the impairments by keeping TV stations out of the 600 MHz band plan to the maximum extent consistent with reasonably high clearing targets (*e.g.*, 84 MHz), or (2) adopt more radical changes to the essential nature of the auction along the lines suggested by Sprint (*i.e.*, abandon the multi-unit uniform price auction and require frequency specific bidding). The first option is vastly preferable, because it would allow the Commission to return to its original framework and auction spectrum of uniformly high quality. Accordingly, there should be an extremely heavy presumption against any plan that

would intentionally place TV stations in the 600 MHz band (recognizing that interference from foreign TV stations will be temporarily inevitable), and the early analysis in these comments suggests that the Commission can likely clear at least 84 MHz nationwide without placing any (or only a very few) TV stations in the LTE band.

The comments also make clear that the Commission should not permit the rules governing the reserve auction to tilt too far in favor of reserve-eligible bidders. In its opening comments, AT&T identified several of the *Notice*'s proposals that threatened to do just that, such as a market-based trigger that is far too low, the placement of the least impaired spectrum in the reserve, the fixing of the amount of the reserve based on the initial clearing targets, and features of the bidding rules that would encourage manipulative bidding.

Not satisfied with these gains, however, the two principal beneficiaries of the reserve—T-Mobile and Sprint—now propose additional modifications that would tilt the reserve even more unreasonably in their favor, including: (1) a further reduction in or elimination of the market-based price trigger, even though all of the available marketplace evidence demonstrates that the Commission's proposed \$1.25 per MHz-POP trigger should be de-coupled from the final stage rule and at least doubled, if not tripled; (2) a proposal to permit Sprint and T-Mobile to engage in joint bidding, which, as Professors Haile and Kearns and Ms. Dworkin explain, is nothing but open collusion and bid-rigging by another name and which would significantly reduce auction revenues and the amount of spectrum that could clear; (3) an expansion of the maximum reserve from 30 MHz to 40 MHz (with an intra-reserve, per-bidder cap of 20 MHz), which would just as effectively permit T-Mobile and Sprint each to win 20 MHz without bidding against each other; and (4) proposals to place even more of the best spectrum in the reserve first, even though the

only sound policy would be to place the best spectrum in the unreserved auction, where *all* bidders (including Sprint and T-Mobile) would have a chance to win it.

The reserve auction unquestionably opens up substantial opportunities for mischief. The reserve rests on an expectation that AT&T and Verizon, as the bidders confined to the unreserved auction, will subsidize the auction for everyone else, but as the AWS-3 auction just dramatically confirmed, if the Commission does not place reasonable and predictable limits on auction policies aimed at providing intra-auction subsidies, strategic or manipulative bidding can lead to unintended consequences and unreasonably large subsidies (even on the order of billions of dollars). The Commission's current reserve auction proposals are completely open-ended and already invite manipulative bidding and massive subsidies. Rather than tilting those policies even more in T-Mobile and Sprint's favor, the Commission must implement a true market-based trigger and, indeed, should consider ways to implement a *cap* on the overall subsidy amounts to ensure that the bids in the reserved and unreserved auctions remain in a reasonable and rational balance.

I. THERE IS A CONSENSUS THAT THE COMMISSION'S PROPOSAL TO ASSIGN TELEVISION STATIONS TO THE 600 MHZ BAND WOULD UNDERMINE THE SUCCESS OF THE AUCTION.

Among the commenters addressing the issue, there is near unanimous agreement that placing TV stations in the 600 MHz band plan would result in a nationwide patchwork of spectrum subject to varying amounts of impairment that can only undermine the success of the auction. NAB, for instance, provides a vivid example illustrating that the application of the proposals in the *Notice* could easily result in a nominal clearing target of 126 MHz, but with only *one* pair of "auctionable" spectrum blocks *out of ten* in New York and Los Angeles, and even

that one pair would likely be impaired.² Placement of TV stations in the 600 MHz band will reduce both the amount and value of available spectrum blocks because TV stations will displace blocks that could otherwise be used for mobile services, and cause interference that will displace or significantly impair additional blocks. Moreover, the resulting variability in impairments among the remaining spectrum blocks eliminates a critical component of the original auction design—*i.e.*, bidding on generic interchangeable spectrum blocks—that will increase the complexity and uncertainty of the auction, further reducing bids. In short, these proposals dramatically increase the potential for sub-par auction results, or even auction failure.

A. The Comments Confirm That The Proposal To Place TV Stations In The 600 MHz Band Would Result In Widespread Impairments And Likely Less Spectrum Capacity Made Available For Mobile Services.

There is overwhelming consensus that placement of TV stations in the 600 MHz band should be avoided to the maximum extent possible.³ The comments demonstrate that, whether

² Comments of the National Association of Broadcasters, AU Docket No. 14-252, GN Docket No. 12-268, at 9-10 (Feb. 20, 2015) (“NAB Comments”); *See also, e.g.*, Comments of Sprint Corporation, AU Docket No. 14-252, GN Docket No. 12-268, at 28-29 (Feb. 20, 2015) (“Sprint Comments”).

³ Sprint Comments at 10-11 (placing TV stations in the 600 MHz band “is unlikely to achieve the Commission’s mandate to promote long-term competition; in fact, it may do just the opposite”); Comments of Cellular South, Inc., AU Docket No. 14-252, GN Docket No. 12-268, at 3 (Feb. 20, 2015) (“C Spire Comments”) (“the best possible result would be a post-auction 600 MHz band with no broadcast-generated impairments”); Comments of CTIA – The Wireless Association, AU Docket No. 14-252, GN Docket No. 12-268, at 4 (Feb. 20, 2015) (“CTIA Comments”) (“the Commission can promote a successful incentive auction by placing television stations in the 600 MHz band only where absolutely necessary, and in a manner that causes minimal disruption to future 600 MHz licenses”); NAB Comments at 6-11 (a plan without TV stations in the 600 MHz band “would allow the FCC to offer predictable, truly fungible blocks of spectrum to wireless carriers in the forward auction, would tremendously reduce the potential for inter-service interference and would provide stability and certainty for all users going forward”); Comments of Verizon, AU Docket No. 14-252, GN Docket No. 12-268, at 5 (Feb. 20, 2015) (“Verizon Comments”) (the Commission’s goals “would be best advanced by adopting a national clearing target with no impaired licenses outside of border markets”); Comments of AT&T, AU Docket No. 14-252, GN Docket No. 12-268, at 11 (Feb. 20, 2015) (“AT&T Comments”) (“The

TV stations are placed in the uplink or downlink, the result would be fewer “auctionable” spectrum blocks in large geographic areas, including in important metropolitan areas, with much of the remaining spectrum subject to significant impairments.⁴ With less spectrum and more impaired spectrum, auction revenues will decline and the auction is less likely to succeed.⁵

Although commenters differ as to whether placing TV stations in the uplink or the downlink would be *worse*, they agree that either would be extremely detrimental.⁶ Placing TV stations in the uplink would cause harm across the largest geographic areas.⁷ A 6 MHz TV station would typically displace two 5 MHz mobile spectrum blocks and impair adjacent spectrum blocks in the same PEA. The TV station would also radiate substantial interference for hundreds of kilometers in all directions, impairing numerous additional blocks in other, often distant, PEAs.⁸ Consequently, many spectrum blocks in and around the PEAs with TV stations

Commission should minimize the placement of TV stations in the 600 MHz LTE band plan, and auction *only* generally unimpaired spectrum blocks . . .”).

⁴ NAB Comments at 13-15 (under the proposals in the *Notice*, the auction would “offer[] little spectrum in the highest demand markets” and “generate little interest on the part of wireless carriers” and thus likely will “not raise enough funds to close”); *see also* Sprint Comments at 23-30, Comments of T-Mobile USA, Inc., AU Docket No. 14-252, GN Docket No. 12-268, at 17-18 (Feb. 20, 2015) (“T-Mobile Comments”); CTIA Comments at 4-5, C Spire Comments at 3-4; Verizon Comments at 4-6; AT&T Comments at 11-14; Philip A. Haile, Michael Kearns, and Lili Dworkin, *Comments on the FCC’s Current Incentive Auction Design Proposals*, attached to AT&T Comments as Attachment A, at 29 (Feb. 20, 2015) (“Haile-Kearns-Dworkin”).

⁵ *See* NAB Comments at iv; Sprint Comments at 23-25; T-Mobile Comments at 18; CTIA Comments at 5; Verizon Comments at 5-6; Haile-Kearns-Dworkin at 8.

⁶ T-Mobile Comments at 23-34; CTIA Comments at 4-5 (describing the harms from placing TV stations in the uplink and downlink); Sprint Comments at 39 & n.63; AT&T Comments at 12.

⁷ C Spire Comments at 4 (“relocation of broadcast facilities in the uplink portion of the broadband spectrum would reduce uplink capacity”); CTIA Comments at 3-4 (“[P]lacement of television stations in the uplink band would . . . result in impairments covering a wider geographic area.”); *see also* AT&T Comments at 12; NAB Comments at 10.

⁸ Although it may be possible to develop base station filters and other technical means of reducing these impairments, they cannot be eliminated entirely, and the trade-off for

in the 600 MHz band will not be “auctionable” because impairment levels will exceed 50 percent, and much of the remaining spectrum will be significantly impaired. For example, NAB estimates that placing just one TV station in the uplink band in the New York and Washington PEAs “would create greater than 50 percent impairment in a total of 14 PEAs with a combined population of 52.8 million and a weighted population of 54 million” and that this “would result in impairments in eight of ten channel blocks and impact the ability to sell channel blocks in up to 35 PEAs.”⁹

At the same time, the comments demonstrate that placing TV stations in the downlink would also cause great harm. Although a TV station in the downlink would typically affect a smaller geographic area, the TV station would knock out service in the majority of, and potentially all of, the mobile downlink blocks in those areas, leaving only uplink spectrum. As T-Mobile explains, “placing a DTV channel in the 600 MHz LTE downlink could cause interference to a mobile device on any frequency supported by the device’s 600 MHz duplexer, which could easily render 25 megahertz of spectrum unusable based on a reasonable assumption of duplexer bandwidth.”¹⁰

To make matters worse, the comments show that the proposal in the *Notice* to permit impairments that affect as much as 20 percent of the weighted population would result in a nationwide patchwork of spectrum that is impaired to varying degrees, and could even result in little or no spectrum available in important metropolitan areas.¹¹ Professors Haile and Kearns

implementing such approaches is significant expense, *i.e.*, developing and placing unique filters at myriad base stations throughout the U.S.

⁹ NAB Comments at 13-15.

¹⁰ T-Mobile Comments at 11. *See also* Verizon Comments at 17-18; CTIA Comments at 5.

¹¹ T-Mobile Comments at 17-18 (the 20 percent standard “does not impose reliable constraints on how broadly or how narrowly the impairments to the 600 MHz band will be distributed by

and Ms. Dworkin explain why this is so,¹² and other commenters drive this point home with various examples. For instance, NAB shows that “all uplink blocks in [New York and Los Angeles] could be impaired, and that the impairments would measure only 10.4 percent of the weighted population, leaving plenty of room for additional impairments in places like San Francisco, Los Angeles, Chicago, and Miami.”¹³ In fact, under the Commission’s proposal, “[t]he weighted population of the New York and Los Angeles [PEAs] represent 20.7 percent of the nation’s total weighted population,” and thus “with a nationwide target of 126 MHz that provides a band plan with ten wireless channel blocks, *nine of ten* wireless channel blocks in these two PEAs could be completely impaired.”¹⁴ “In other words, the Commission would still comply with its proposed standard while only having one channel block available for sale in the forward auction in New York and Los Angeles.”¹⁵

geography” and “the MHz-POP weighting requirement could [] allow for an auction to close where several large markets are unavailable for broadband deployment); NAB Comments at 9-10 (because of weighting, impairments in certain cities would cause a situation where “the Commission’s near nationwide plan is not only not near 100 percent, it may not even be nearly 80 percent”); Verizon Comments at 4-5 (the 20 percent cap would “[c]reat[e] an extensive patchwork of impaired and unimpaired markets throughout the entire country”); AT&T Comments at 4 (“Under the Commission’s proposal, then, TV stations would dot the 600 MHz LTE band plan all over the nation, because the Commission’s proposed assignment methodology would allow impaired spectrum in up to 20 percent of the national spectrum-value-weighted population . . .”).

¹² See Haile-Kearns-Dworkin at 22-26.

¹³ NAB Comments at 10 (emphasis omitted).

¹⁴ *Id.* at 9 (emphasis added).

¹⁵ *Id.* See also, e.g., Verizon Comments at 4 (“That high [20 percent] number could mean hundreds of significantly impaired wireless licenses, and impaired markets would likely be scattered across the country, leaving uneven amounts of repurposed spectrum and a large patchwork of areas that do not conform to the nationwide band plan.”); T-Mobile Comments at 18 (“At higher clearing targets, the MHz-POP weighting requirement could [] allow for an auction to close where several large markets are unavailable for broadband deployment . . .”); AT&T Comments at 4 (the 20 percent proposal “leads to very high clearing targets with less ‘auctionable’ spectrum blocks than lower clearing targets would produce”); Haile-Kearns-Dworkin at 31 (“the current PN proposal of ‘baking in’ impairment as part of the clearing target

The comments also demonstrate that the proposed methodology for computing the 20 percent impairment level would actually permit more than 20 percent of the weighted (and actual) population to be covered by impaired spectrum, thus making the problems worse. For example, the Commission proposes to compute impairment using the F(50,50) statistical measure, which assumes impairments only when a TV signal would interfere with wireless operations in 50 percent of the locations within the wireless license areas 50 percent of the time.¹⁶ But no wireless network would be designed to permit such significant interference. Real-world wireless networks are engineered to much higher standards, *i.e.*, less interference less of the time. And the difference is far from trivial. As Sprint demonstrates, under a F(50,10) statistical measure, for example, many more spectrum blocks in many more PEAs would be impaired than under the F(50,50) approach. Indeed, Sprint provides multiple examples showing that spectrum blocks in PEAs with near zero impairment under the F(50,50) measure actually have much higher levels of impairment, sometimes even more than 50 percent impairment, which means that they could not be auctioned at all.¹⁷

Other features of the proposed methodology further exacerbate the problem. For example, under the proposal, only half of the weighted population in areas with uplink impairment contribute to the 20 percent impairment cap, which means that uplink impairments

maximization is likely to create impairments in large metro markets that are far from the border”).

¹⁶ Notice ¶ 145; *see also* CTIA Comments at 10-11; Sprint Comments at 11-12.

¹⁷ *See* Sprint Comments at 16-21. To the extent the Commission uses the F(50,50) standard for computing impairment, AT&T agrees that the Commission should also provide bidders with the impairment levels for each block using the F(50,10) metric. *See* CTIA Comments at 10; Sprint Comments at 16.

can cover up to 40 percent of the weighted population. When this is combined with the F(50,50) standard, actual impairments could cover well over half of the weighted and actual population.¹⁸

B. The Comments Confirm That The Proposal To Place TV Stations In The 600 MHz Band Will Create Widespread Variation In The Quality Of Spectrum Blocks In The Auction And Thus Undermine An “Essential” Feature Needed For The Auction To Succeed.

The comments demonstrate that the proposal to place TV stations in the 600 MHz LTE band will also create enormous complexity and uncertainty in the forward auction that will further depress bids and reduce the amount of spectrum that will clear.¹⁹ In the *Incentive Auction Order*, the Commission adopted an ascending clock auction for selling spectrum to mobile providers. Under this approach, a bid is made in the form of the number of spectrum blocks demanded at each price. As long as demand exceeds supply, prices increase, and the auction concludes when prices reach levels that cause demand to equal supply. As the Commission has previously recognized, and as the comments confirm, an essential element of this type of auction is that spectrum blocks offered to bidders are generic (*i.e.*, largely interchangeable) so that bidders can effectively determine their demand at each price level.²⁰

¹⁸ Moreover, some areas contribute more to the 20 percent impairment cap than others due to the *Notice*'s complex mechanism for weighting population. For example, as NAB points out, “the actual population of Buffalo is 1,135,509,” but under the weighting approach used for computing the 20 percent impairment cap “the population of Buffalo counts as only 50,358.” Consequently, “[w]ireless impairments in Buffalo, and many other communities . . . have virtually no impact on whether the Commission is approaching its proposed 20 percent cap on variability.” NAB Comments at 9.

¹⁹ See, e.g., Sprint Comments at 13; CTIA Comments at 13; Verizon Comments at 4-5; AT&T Comments at 5; Haile-Kearns-Dworkin at 7.

²⁰ Report and Order, *Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions*, GN Docket No. 12-268, 29 FCC Rcd. 6567, ¶ 79 (2014) (“*Incentive Auction Order*”), Sprint Comments at 10-11, NAB Comments at 7, Verizon Comments at 7, AT&T Comments at 17, Haile-Kearns-Dworkin at 7.

As commenters from all points of view demonstrate, the proposal to place TV stations in the 600 MHz band plan eliminates this essential feature by causing impairments to spectrum blocks that vary from zero to more than 50 percent.²¹ The proposal to divide spectrum into multiple auctions with two categories of spectrum (Category 1 with impairments from 0-15 percent and Category 2 with impairments from 15-50 percent) will not solve this problem. First, the commenters broadly agree that the wide range of impairments within each “Category” will substantially reduce demand at any given price relative to an auction with generic and largely unimpaired spectrum, because prices will reflect some average of the expected value of spectrum blocks that now include substantially impaired spectrum.²²

Second, the comments demonstrate that this effect will be exacerbated by the fact that the proposed impairment measures understate actual impairment levels from the point of view of bidders. For example, as discussed above, the Commission’s proposed measure of impairment is based on the F(50,50) statistical measure. But no network operator would build its network around spectrum with such high impairment levels. As a result, bidders will discount their bids further, to account for the fact that any spectrum they win will likely be more impaired than indicated by the Commission’s measures. Sprint, for example, has shown that many spectrum blocks that may be designated “Category 1” by the Commission’s F(50,50) metric would

²¹ See, e.g., Sprint Comments at 10-13; T-Mobile Comments at 33; NAB Comments at 7; Verizon Comments at 6-7, CTIA Comments at 10; AT&T Comments at 5.

²² See, e.g., Sprint Comments at 15 (“Lumping impaired blocks within two broad bidding categories effectively hides the nature and extent of impairments from bidders during the clock phase of the forward auction.”) (footnote omitted); see also, e.g., CTIA Comments at 13; Verizon Comments at 4-5; Haile-Kearns-Dworkin, at 7; AT&T Comments at 5.

actually be Category 2 or even unavailable for auction at all if the more standard F(50,10) metric were used.²³

Third, the comments confirm that the Commission's proposed impairment measure improperly ignores the *type* and *location* of impairment. Even if the Commission's impairment metric based on the F(50,50) approach were meaningful, it does not differentiate whether the relevant impairment is an exclusion zone or just interference, nor whether the impairment covers critical commuting corridors, sports stadiums, shopping malls, or other areas that the Commission's methodology might regard as not affecting areas where people live.²⁴ These issues create additional complexities and uncertainties as to the quality and value of spectrum in the auction that will further reduce bids.

Fourth, the comments correctly note that the *Notice's* proposal will create yet additional uncertainty among bidders as to whether they will be able to obtain contiguous relatively unimpaired spectrum blocks over larger geographic areas. As Verizon explains, "[t]he erratic pattern [of impaired spectrum blocks] would not track any recognizable logical geographic region or economically integrated area, a fact that would make it difficult for forward auction

²³ See Sprint Comments at 18-21; see also *id.* at 17, n.28 ("[T]he basis upon which the Commission has determined their relative fungibility – a single criterion, using a blunt statistical tool – is flawed and will both underestimate and effectively hide the dissimilarity of spectrum blocks within a category.") (emphasis omitted). The Commission's approach to measuring impairment also ignores interference that would result if devices are permitted to operate in TV Whitespaces and if wireless microphones are permitted to operate in the duplex gap and guard bands. See Comments of CTIA – The Wireless Association, ET Docket No. 14-165, GN Docket Nos. 14-166 & 12-268, at 32 (Feb. 4, 2015), and attached report by V-Comm, at Appendix C.

²⁴ See, e.g., Sprint Comments at 28 ("Impairment of 33% of PEA 1 could conceivably cover the entire population of the City of New York. Impairment of the same extent – 33% – could instead cover the 14 New Jersey and six Pennsylvania counties located in PEA 1. No wireless operators would place comparable value on the two very different 33% percent impairment situations described above.").

bidders to plan their bidding across adjacent markets or in regional areas.”²⁵ As the Commission has recognized, mobile providers place significant value on geographically contiguous spectrum, and uncertainties as to whether usable contiguous blocks can be obtained will further drive down bids.

The comments also confirm that these problems are not fixed by allowing bidders to express a preference for specific spectrum during the assignment phase, or by providing linear one percent rebates. To the contrary, the Commission’s proposals will actually make things worse by siphoning revenues from the clock auction to the assignment auction, putting downward pressure on clearing targets. Due to the high variation in impairments of spectrum in the clock auction, bidders will likely shift amounts they may otherwise have included in bids in the clock auction to the assignment phase, producing lower overall revenues in the clock auction. Because the determination whether clearing targets are met is based on clock auction revenues, this will result in less cleared spectrum.²⁶

The “black box” nature of the assignment phase will further depress bids in the clock auction. The Commission will not necessarily allocate spectrum to the highest bidder in the assignment phase, but will prioritize a range of other factors, such as spectrum contiguity for each bidder. As commenters point out, this feature increases uncertainty for bidders in the forward clock auction as to whether they will be able to obtain less impaired spectrum in the assignment round, which can only further reduce bids in the ascending clock auction and reduce the quantity of spectrum cleared.²⁷

²⁵ Verizon Comments at 4; *see also* Sprint Comments at 20-21.

²⁶ Haile-Kearns-Dworkin at 7-8. *See also* Sprint Comments at 31-33; Verizon Comments at 7; CTIA Comments at 11-14.

²⁷ *See, e.g.*, Sprint Comments at 5-6, 28-29; Haile-Kearns-Dworkin at 6-8; AT&T Comments at 5, 18-19.

The commenters also agree that the one percent refund for impairment is not an effective mechanism for counteracting the harms from placing TV stations in the 600 MHz band, because it does not account for the true reduction in value caused by the resulting impairments. To begin with, it ignores that there will be instances where bidders would prefer to purchase no spectrum at all than obtain highly impaired spectrum at a discount. Bidders will therefore further discount their bids if they believe there is a chance that they will end up having to spend large sums for spectrum that, all else equal, they would not have chosen to purchase otherwise.²⁸

The one percent rule also incorrectly assumes that all impairments are valued the same by bidders. As the comments show, this is not the case. For example, the reduction in value for a spectrum block with 14 percent impairment might be greater if the impairments are caused mainly by exclusion zones than if they were caused mainly by interference to mobile operations. Similarly, if the impairments are located in critical commuting corridors, the reduction in value may be greater than if the impairments are located in more peripheral “unpopulated” areas. As Sprint points out, a “narrow focus on the percentage of the license area population that is impaired overlooks a number of important factors. For instance, certain less-populated areas may hold significant utility value for operators – consider highway interchanges, sports stadiums and areas around them, or large shopping malls at a distance from population centers. . . . Thus, a trivial discount for an impairment covering such an area would reflect only that few people live there, not the true value of foregoing 600 MHz coverage.”²⁹

²⁸ *Cf.* Sprint Comments at 24 (“In truth, the effect of impairment on spectrum block utility and thus valuation is more likely to be reflected by a step function, with some intervals of impairment levels having little if any difference in valuation and other intervals having steep effects.”).

²⁹ *Id.* at 24-25; *see also* CTIA Comments at 13 (“CTIA believes that the Commission’s numerical, linear approach to impairment does not truly reflect the value of a license or the impact of impairment. Put simply, the value of an impaired license does not decline linearly as

C. The Commission Should Auction A Single Category Of Spectrum That Is Relatively Unimpaired.

Recognizing that the proposals in the *Notice* significantly threaten the success of the auction, commenters suggest a wide range of potential solutions. Some commenters propose to layer on more “fixes” to the fixes already proposed in the *Notice* for addressing the harms caused by the proposal to permit TV stations to be placed in the 600 MHz band. But laying band aids upon band aids will not work. That approach only adds to the complexity and uncertainty of the auction and increases the potential for harmful unintended consequences, all of which substantially increase the risk of auction failure.³⁰

For example, T-Mobile proposes to mitigate the potential for the 20 percent rule to produce little or no spectrum in large metropolitan areas by adding an additional requirement that any solution that satisfies the 20 percent cap must also result in at least four paired licenses being made available in 9 of top 10 PEAs.³¹ But T-Mobile provides no analysis as to the overall impact of this additional rule, which could, for example, result in much greater impairments in

the degree of impairment rises. There are several scenarios where a numerically small impairment could have a major impact on a license’s value. For example, there are locations that are essentially unpopulated – such as interstate highways and stadiums – where wireless coverage is nonetheless extremely important. Should a license’s zone of impairment include these areas, the value of the license would be significantly diminished. Moreover, if a certain percentage of the population in a key portion of the PEA is impaired (such as an urban cluster), the overall value of the license could be greatly reduced – much more than the population impaired.”).

³⁰ *See, e.g.*, T-Mobile Comments at 16 (“[T]he Commission should choose the initial clearing target that will maximize the number of licenses in the top 10 markets by value-weighted pops” because “[t]aking into consideration of the geographic distribution of impairments . . . will mitigate the possibility that the U.S. market will fall below the scale necessary to support a high level of investment and innovation”); *see also id.* at 20 (the Commission should “adopt[] a 10% nearly-nationwide weighted MHz-POP standard for spectrum-clearing targets of more than 84 megahertz and 20% nearly-nationwide weighted MHz-POP standard for spectrum-clearing targets of 84 megahertz or less”).

³¹ *Id.* at 17-28.

the rest of the top 100 or top 40 PEAs, thus producing overall more harm than good. Similarly, T-Mobile also proposes to vary the 20 percent cap depending on the clearing target (*e.g.*, less than 20 percent for higher clearing targets).³² Again, however, T-Mobile provides no analysis of the overall impact of this proposal, nor even how it might practically be implemented. Such variation in the impairment cap would also further complicate the auction, result in more uncertainty among bidders, and could increase the potential for harmful strategic bidding by those that may benefit from a higher or lower national impairment cap.

There are really only two alternative ways to right the ship: (1) reject the proposal to allow widespread placement of TV stations in the 600 MHz band, thus returning to an ascending clock auction where participants place bids on generic spectrum blocks; or (2) redesign the auction altogether and develop an auction that permits frequency-specific bidding along the lines proposed by Sprint.³³

AT&T supports the former approach. Under AT&T's proposal, the forward auction would include only one category of truly generic spectrum (*i.e.*, with a very low variability in actual impairments). With a return to generic spectrum, the enormous complexities and uncertainties associated with attempting to auction highly variable spectrum in an ascending clock would largely melt away. The result would be a far simpler and transparent auction in which bidders could confidently bid based on the true value of the spectrum in the ascending clock auction, which would ensure the highest achievable clearing targets.³⁴

³² *Id.* at 19-20.

³³ *See* Sprint Comments at 37-38.

³⁴ Verizon Comments at 4 (“The Commission should auction unimpaired licenses in most of the country and limit the sale of impaired licenses to only the border markets”); AT&T Comments at 6 (“there is a very high likelihood that the Commission can clear at least 84 MHz of spectrum nationwide without having to assign TV stations to the 600 MHz band (except perhaps in border

The evidence indicates that there is a high likelihood that the auction will clear at least 84 MHz of spectrum nationwide without the need for placing TV stations in the 600 MHz band, and certainly without the need to place so many TV stations there that 20 percent (or more) of the population would be impaired. To be sure, at this stage, there is insufficient data to rule out a need for *some* flexibility to place TV stations in the 600 MHz band, but given the significant harm such an approach would cause, it should be avoided unless it is absolutely necessary to preclude an unreasonably low clearing national target (*e.g.*, below 84 MHz). And even then, only the relatively unimpaired spectrum should be included in the auction.

The Commission can also take steps to minimize or eliminate any need to put TV stations in the 600 MHz band. For example, the comments show that, as the auction progresses and TV stations begin to drop out of the auction (and thus require repacking), the difficulty of repacking each remaining TV station will change. In many instances, it will become increasingly difficult to repack particular TV stations as the auction progresses. The reduction in the price offered to such TV stations should be adjusted to reflect increases in repacking difficulty (*i.e.*, the prices should be reduced less), thus reducing the risk that TV stations will have to be placed in the 600 MHz band to achieve desirable clearing targets.³⁵

Finally, several commenters agree that the Commission should address separately the spectrum that is impaired by TV stations operating in Canada and Mexico. This spectrum, while impaired today, is likely to be cleared of impairments in the future. It is thus reasonable to sell this spectrum. However, it should be auctioned separately, perhaps in an ordinary SMR auction, conducted after the incentive auction.

areas), and certainly without assigning stations covering 20 percent or more of the weighted population”).

³⁵ See Haile-Kearns-Dworkin at 33-36.

II. THE COMMISSION SHOULD REJECT THE RESERVE-ELIGIBLE BIDDERS' PROPOSALS TO TILT THE AUCTION EVEN MORE DRAMATICALLY IN THEIR FAVOR.

The reserve auction represents a substantial departure from an open and fair competitive bidding process, and by its very nature the reserve threatens to reduce auction revenues, reduce the amount of spectrum that clears, misallocate spectrum to less valued uses, and create opportunities for manipulative bidding practices. By creating a special, protected reserve auction, the Commission has established a system in which bidders in the unreserved auction—principally AT&T and Verizon—are expected to subsidize the transfer of spectrum to their broadband competitors. Although AT&T does not believe that a reserve auction is either lawful under the Spectrum Act or necessary to help well-funded competitors like T-Mobile or Sprint, AT&T would not challenge the reserve if the Commission adopted adequate protections. In that regard, it is critical that the Commission not allow the rules to tilt too far in favor of the reserved bidders, because the larger the implicit intra-auction subsidies – and the greater the opportunities for reserved bidders to use manipulative bidding to increase those subsidies – the more likely that overall auction revenues and clearing targets will fall short of what is necessary for a successful auction.

In its opening comments, AT&T identified several aspects of the Commission's new proposals that would, in fact, tip the reserve auction too far in favor of the reserved bidders – specifically, the low level of the market-based trigger, the placement of Category 1 spectrum in the reserve, the fixing of the amount of the reserve based on the initial clearing targets, and features of the bidding rules that would encourage manipulative bidding. The principal beneficiaries of the reserve, however, insist that the Commission should tilt the reserve auction rules even more unreasonably in their favor, by expanding the size of the reserve, lowering the market-based trigger even further, and permitting joint bidding. The Commission should reject

all of these proposals. To the contrary, as explained below, the Commission should consider a mechanism that would cap the size of the overall intra-auction subsidy *ex ante* to ensure that the reserve does not become an unwarranted windfall that threatens the objectives of the auction.

Market-Based Trigger. In its opening comments, AT&T showed that the Commission’s proposal to set the market-based trigger at \$1.25 per MHz-POP in the top 40 markets was far too low and would simply hand spectrum to reserve-eligible bidders at prices that would not return fair value for the public. The proponents of a protected reserve auction, however, would gut even this toothless trigger: T-Mobile argues that the trigger should occur when the bidding reaches \$1.25 in the top 25 markets, while CCA argues that the market-based trigger should be eliminated altogether.³⁶

First, T-Mobile’s professed concern that the Commission may have set the trigger too high is absurd. Indeed, it is almost laughable that T-Mobile would assert that marketplace bidding would be a better guide to the true value of this spectrum than the Commission’s guesses – even as it advises the Commission on how to funnel the best spectrum to T-Mobile at below-market prices in a special auction *protected* from those market forces.³⁷ The truth is that \$1.25 per MHz-POP is far below any reasonable estimate of the market value of this spectrum. As AT&T showed, prices for Lower 700 MHz B Block spectrum, which are the “most comparable to the 600 MHz band plan,”³⁸ sold for \$3.75 per MHz-POP in the top 40 PEAs. Moreover, spectrum in the recent AWS-3 auction sold for an average of about \$3.52 per MHz-POP in the

³⁶ T-Mobile Comments at 39-41; Comments of Competitive Carriers Association, AU Docket No. 14-252, GN Docket No. 12-268, at 32 (Feb. 13, 2015) (“CCA Comments”).

³⁷ T-Mobile Comments at 39 (“the best judge of the market is the market, not the seller [*i.e.*, the Commission]”).

³⁸ Greenhill, Incentive Opportunities for Broadcasters, at 6 (October 2014), *available at* <http://wireless.fcc.gov/incentiveauctions/learn-program/docs/ia-opportunities-book.pdf>.

top 40 PEAs, even though that spectrum is high-band, encumbered spectrum. Those prices were \$3.87 and \$3.74 respectively for the top 25 PEAs – well over three times T-Mobile’s proposal. If the 600 MHz spectrum at issue here is worth only \$1.25 per MHz-POP in the top 25 PEAs, then this auction is destined to be a complete failure.

Eliminating the market-based trigger entirely would be completely untenable.³⁹ It would permit reserve-eligible bidders to obtain spectrum at enormous discounts, with the effect being massive subsidies from taxpayers to multi-national corporations like Sprint and T-Mobile. Indeed, these subsidies could exceed even the \$3 billion in subsidies that Dish is now claiming in the AWS-3 auction, which has led to great and well-founded concern from Congress and the public.⁴⁰ The Commission has correctly recognized that there must be some mechanism to preclude an undue windfall to certain competitors, given that the Communications Act requires the incentive auction to ensure “recovery for the public of a portion of the value of the public spectrum resource made available for commercial use and avoidance of unjust enrichment through the methods employed to award uses of that resource.”⁴¹ The Commission has therefore

³⁹ See CCA Comments at 31-33; Sprint at 47-48.

⁴⁰ See, e.g., Lindsay Wise, “McCaskill Warns FCC to Mend Loophole On Wireless Auctions,” McClatchyDC (Feb. 26, 2015), available at <http://www.mcclatchydc.com/2015/02/26/257967/mccaskill-warns-fcc-to-mend-loophole.html>; Ryan Knutson and Thomas Gryta, “Regulator Objects to Dish’s Wireless Deal,” Wall Street Journal (Feb. 2, 2015), available at <http://www.wsj.com/articles/regulator-objects-to-dishs-wireless-deal-1422853261>; See also, e.g., Comments of T-Mobile USA, Inc., WT Docket Nos. 05-211 & 14-170, GN Docket No. 12-268, at 3 (Feb. 20, 2015) (“Rules that permitted [DISH’s] bidding activity not only compromised the efficiency of the auction outcome, they lessened confidence in the auction process itself.”); Comments of Americans for Tax Reform, Center for Individual Freedom, National Taxpayers Union, Taxpayers Protection Alliance, WT Docket Nos. 14-170 & 05-211, GN Docket No. 12-268, at 7-8 (Feb. 20, 2015); Comments of Thomas A. Schatz, President, Citizens Against Government Waste, WT Docket Nos. 14-170 & 05-211, GN Docket No. 12-268, at 3 (Feb. 20, 2015); Comments of AT&T, WT Docket Nos. 14-170 & 05-211, GN Docket No. 12-268, at 9-10 (Feb. 20, 2015).

⁴¹ 47 U.S.C. § 309(j)(3)(C).

recognized that the reserve auction must have safeguards to ensure that reserve spectrum is not sold at prices below market levels, which would give reserve-eligible bidders an unwarranted windfall and deprive taxpayers of a “portion of the value” of the spectrum.⁴² As AT&T previously explained, the only way to provide that assurance is to de-couple the market-based reserve trigger from the final stage rule and increase the baseline trigger proposed by the Commission to a level more in line with the obvious, baseline market value of the spectrum at issue.⁴³

Joint Bidding. Sprint argues that the Commission should allow nationwide broadband providers to engage in joint bidding in this auction in any PEA in which the two providers together have less than 45 MHz of sub-1 GHz spectrum.⁴⁴ Notably, such a policy would permit Sprint and T-Mobile to bid jointly in a large number of PEAs across the country. The Commission has already correctly proposed to prohibit joint bidding arrangements among nationwide carriers.⁴⁵ As AT&T has explained in its Part I Reply Comments, the Commission should ban joint bidding agreements altogether and require a strong anti-collusion certification from each applicant that it has not entered in any arrangements or understanding regarding joint bidding and has no knowledge of any other applicant’s strategy.⁴⁶ In cases where entities wish to

⁴² *Id.*; see also *Incentive Auction Order* ¶ 343 (“[a]n objective common to *all* FCC auction of spectrum licenses is that auction prices generally reflect competitive market values for comparable spectrum licenses” (emphasis added)).

⁴³ AT&T Comments at 32; Haile-Kearns-Dworkin at 14.

⁴⁴ See Comments of Sprint Corporation, WT Docket Nos. 14-170, 05-211, GN Docket No. 12-268, RM-11395, at ii, 11-12 (Feb. 20, 2015).

⁴⁵ Notice of Proposed Rulemaking, *Updating Part 1 Competitive Bidding Rules, et al.*, WT Docket No. 14-170, *et al.*, 29 FCC Rcd. 12426, ¶ 109 (2014).

⁴⁶ See Reply Comments of AT&T, WT Docket No. 14-170 (filed Mar. 6, 2015).

coordinate their bidding activity, they could apply to form a bidding joint venture or consortium under which they would bid as a single entity.⁴⁷

As Professors Haile and Kearns and Ms. Dworkin explain, joint bidding is otherwise “just another name for bidder collusion or bid rigging, *i.e.*, an arrangement by which bidders coordinate to avoid competing with each other and obtain more favorable prices for themselves.”⁴⁸ In an ascending clock auction, collusion reduces revenues “by enabling the joint bidders to internalize competitive externalities and avoid competing with each other.”⁴⁹ Under any such agreement, the parties would coordinate to avoid head-to-head competition wherever possible, with the goal of reducing the prices the coordinating bidders pay.⁵⁰ Although joint bidding would have these anti-competitive effects in both the reserved and unreserved auctions, the revenue-reducing effects are likely to be especially severe in the reserve auction, since in many cases Sprint and T-Mobile would represent each other’s strongest competitor absent the joint bidding arrangement.⁵¹ Moreover, a Commission rule expressly permitting joint bidding would facilitate especially effective anti-competitive collusion, because the jointly bidding parties could openly coordinate their actions without having to deal with the usual need to take steps to evade detection.⁵²

In addition, the anti-competitive effects of joint bidding would be even more extensive than usual in a multi-unit uniform price auction like this one. The existence of a joint bidding

⁴⁷ *See id.*

⁴⁸ Philip A. Haile, Michael Kearns, and Lili Dworkin, *Reply Comments on the FCC’s Current Incentive Auction Design Proposal*, attached hereto as Attachment A, at 9 (Mar. 13, 2015) (“Haile-Kearns-Dworkin Reply”).

⁴⁹ *Id.* at 10.

⁵⁰ *Id.* at 10-11.

⁵¹ *Id.* at 10.

⁵² *Id.* at 9.

arrangement gives both parties greatly magnified incentives to withhold demand for additional licenses to avoid driving up the price for the other partner. In a fully competitive auction, Sprint would feel free to bid for a second or third license if it wanted to do so without worrying about whether its bidding might ultimately drive up the price for licenses T-Mobile wanted. Joint bidding allows the parties “to negotiate to avoid this outcome, holding prices down by design.”⁵³ Accordingly, joint bidding not only allows the two parties to avoid competing head-to-head for individual licenses, it gives them incentives to withhold demand for additional licenses that either party is likely to win.⁵⁴

Although the anti-competitive consequences of Sprint’s proposed joint bidding would be inherently contrary to the public interest, they would be especially harmful in the context of this auction, in which suppressed bids and reduced revenues will lead to a reduction in the amount of spectrum that will clear. Sprint has simply provided no sound basis for endorsing this form of anti-competitive collusion – especially given that such collusion would threaten the larger objectives of the auction.

The Size of the Reserve. The Commission should reject T-Mobile’s argument that it should expand the maximum size of the reserve from 30 MHz to 40 MHz.⁵⁵ The Commission previously found that setting the maximum amount of reserved spectrum at 30 MHz will “facilitate the repurposing of more spectrum in the 600 MHz Band, because it provides the opportunity, and creates incentives, for all auction participants to bid aggressively to acquire more spectrum licenses as the total amount of available spectrum increases.”⁵⁶ In contrast, the

⁵³ *Id.* at 11.

⁵⁴ *Id.* at 10.

⁵⁵ T-Mobile Comments at 3-4.

⁵⁶ Report and Order, *Policies Regarding Mobile Spectrum Holdings, et al.*, WT Docket No. 12-

Commission specifically concluded that making the reserve larger would fail “to provide all bidders with an adequate opportunity to acquire licenses in the 600 MHz auction.”⁵⁷ Indeed, the Commission expressly recognized that AT&T and Verizon would be precluded altogether from bidding for “reserved” spectrum in many areas, and thus T-Mobile’s approach would preclude them from obtaining efficient levels of spectrum “notwithstanding their demonstrated demand.”⁵⁸ It also properly recognized that T-Mobile’s preferred allocation of reserved spectrum might improperly allow “T-Mobile and Sprint to acquire spectrum at a significant discount.”⁵⁹

T-Mobile’s contention that a 30 MHz reserve would be “too small” is based on T-Mobile’s specious claim that reserve-eligible bidders can win spectrum only in the reserve auction. This is of course not true: there is no limitation on how much spectrum the reserve-eligible providers can win. *All* auction participants may bid for the “unreserved” spectrum, and thus neither T-Mobile nor any other reserve-eligible bidder is “preclud[ed] from acquiring . . . substantial amounts of spectrum.”⁶⁰ If T-Mobile places a higher value on unreserved spectrum than other bidders, it can win that spectrum.⁶¹

269, *et al.*, 29 FCC Rcd. 6133, ¶ 189 (rel. June 2, 2014) (“*Mobile Spectrum Holdings Order*”) (emphasis omitted); *see also id.* ¶ 191 (“[A] maximum spectrum reserve of 30 megahertz for most levels of total available spectrum licenses, on balance, will make additional low-band spectrum available to multiple providers; ensure that all bidders have an opportunity to acquire a state in the 600 MHz ecosystem that will be critical in the future; and facilitate competitive bidding.”).

⁵⁷ *Id.* ¶ 191.

⁵⁸ *Id.* ¶ 193.

⁵⁹ *Id.*

⁶⁰ T-Mobile, Petition For Reconsideration, WT Docket No. 12-269 (filed Aug. 11, 2014).

⁶¹ *Mobile Spectrum Holdings Order* ¶ 190 (“[A] maximum of 30 megahertz for most levels of reserved spectrum will leave a significant amount of unreserved spectrum available, *which all bidders will have the opportunity to compete.*”) (emphasis added).

T-Mobile's claim that the AWS-3 auction shows that AT&T and Verizon will "dominate" the unreserved auction "absent Commission intervention" is also incorrect. To the contrary, T-Mobile is drawing all of the wrong lessons from that auction. T-Mobile's principal competition was Dish, not AT&T or Verizon.⁶² Bidding patterns suggest that T-Mobile was primarily interested in the G-Block, and it bid aggressively for that spectrum in cities like Chicago, Seattle, and Denver. But it was the Dish designated entities that won that G-Block spectrum from T-Mobile in the top 100 CMAs. In fact, an analysis of winning bids and who the winning bidder had to bid off to win the license shows that Dish outbid T-Mobile on 132 licenses to win the license; by contrast, AT&T outbid T-Mobile for 26 licenses and Verizon outbid T-Mobile for 16.⁶³ By the same token, of the 151 licenses that T-Mobile did win, it had to outbid Dish on 69 of them to succeed (compared to outbidding AT&T on 12 and Verizon on 32).⁶⁴

Equally important, the fact that AT&T and Verizon bid more than T-Mobile in that auction says nothing about how much broadband providers might bid in the 600 MHz auction. As T-Mobile's CFO just told Wall Street, T-Mobile followed a "very disciplined" strategy in the AWS-3 auction because it believed it was already well positioned in mid-band spectrum.⁶⁵ Indeed, he bragged that "[w]e went into the AWS-3 auction with the best mid-band portfolio in the U.S. and we came out of it with the best mid-band portfolio."⁶⁶ He also "hinted T-Mobile

⁶² See Joan Marsh, "Auction 97 – More Lessons For Future Auctions" (March 4, 2015), <http://www.attpublicpolicy.com/wireless/auction-97-more-lessonsfor-future-auctions> ("Marsh Auction 97 Post"); see also Kathleen Grillo, "The Real Lesson of the AWS-3 Auction" (March 10, 2015), <http://publicpolicy.verizon.com/blog/entry/the-real-lesson-of-the-aws-3-auction>.

⁶³ See Marsh Auction 97 Post.

⁶⁴ *Id.*

⁶⁵ See "Comm Daily Notebook," Communications Daily, March 6, 2015.

⁶⁶ *Id.*

may go much bigger in the TV incentive auction.”⁶⁷ Certainly, if T-Mobile wants to “go big” in the 600 MHz auction, Deutsche Telekom is a large, well-capitalized firm that has the ability to do so. But if T-Mobile’s deep-pocketed parent is not willing to invest in its U.S. operations, it is not the U.S. government’s job to give subsidies to this giant German corporation.⁶⁸

Expanding the maximum size of the reserve from 30 to 40 MHz could be particularly harmful to auction revenues, because as a practical matter such a incremental jump would facilitate market division between reserve-eligible bidders like T-Mobile and Sprint and allow both to obtain two blocks apiece without having to bid against each other. Such an expansion of the protected portion of the auction would permit those two providers to obtain 20 MHz of spectrum at prices far below market levels and likely result in a disproportionate incremental reduction in auction revenues. Indeed, T-Mobile itself appears to assume that its proposal would cost taxpayers revenues, because it explicitly argues both (1) that the Commission should be more concerned about dictating auction outcomes than “arbitrary revenue goals,” and (2) that the Commission does not need that much revenue from this auction anymore anyway given that FirstNet is now funded.⁶⁹ Moreover, this proposal would necessarily reduce the amount of spectrum in the unreserved auction and could thus undermine AT&T’s and Verizon’s and other unreserved bidders’ ability to obtain a minimally efficient spectrum footprint in the auction.

⁶⁷ *Id.*

⁶⁸ See Phil Goldstein, “T-Mobile’s Carter: We’d Be a ‘Very Interesting’ Partner for Dish,” Fierce Wireless, March 5, 2015, available at <http://www.fiercewireless.com/story/t-mobiles-carter-wed-be-very-interesting-partner-dish/2015-03-05> (quoting T-Mobile’s CFO saying ‘our network was architected for mid-band spectrum and given what’s happened with data we’re in a wonderful position. . . . We estimate that we have multiple years of runway with our current spectrum holdings’’).

⁶⁹ T-Mobile Comments at 3.

Notably, an expansion of the reserve would be especially harmful if the Commission were to adopt T-Mobile's additional proposal to prohibit any reserve-eligible bidder from winning more than 20 MHz of the spectrum in the reserve auction.⁷⁰ In the context of the reserve auction, such rules would effectively prohibit T-Mobile and Sprint from bidding against each other in the reserve, thus facilitating a *de facto* collusion among the two firms to acquire 20 MHz apiece at the lowest possible prices.⁷¹

The Spectrum Placed in the Reserve. As AT&T previously explained, the proposal to fill the reserve with Category 1 spectrum is unlawful and will unduly decrease auction revenues and clearing targets. The beneficiaries of the reserve, however, propose even more extreme versions of these measures, such as including the least impaired licenses in the reserve in each PEA, or expanding the reserve to include Category 2 licenses if there are not enough Category 1 licenses.

As AT&T previously explained, these approaches have things exactly backwards. If the Commission follows through with its proposal to auction two categories of impaired spectrum, the Commission should start by placing the *Category 2* spectrum in the reserve, not the best, Category 1 spectrum. If the Category 1 spectrum is in the unreserved auction, then every bidder has a chance to obtain relatively unimpaired spectrum, because reserve-eligible bidders that want Category 1 spectrum can still bid in the unreserved auction. The converse is not true: placing the Category 1 spectrum in the reserved auction all but guarantees that unreserved bidders will be bidding for the worst spectrum. The result, from the public's standpoint, would be the worst of both worlds: the very best, most valuable spectrum would be simply handed to favored bidders at prices far below market levels, while the relatively low quality of the spectrum in the unreserved auction would depress auction revenues there as well. The Commission's clearing

⁷⁰ See T-Mobile Comments at 4-5.

⁷¹ *Id.* at 8.

targets would be threatened, and the public would not realize a reasonable share of the value of the spectrum as Congress intended.

Sprint's Reserve Proposal. The Commission should also reject Sprint's proposal to begin the auction with the reserve in place, and retract the reserve only later if the total demand from reserve-eligible bidders remains below supply for some extended period.⁷² As Professors Haile and Kearns and Ms. Dworkin explain, such an approach would provide no safeguards against "unnecessary failures of clearing targets due to the spectrum reserve."⁷³ Reserve demand could equal or exceed supply at prices too low to satisfy the final stage rule, but under Sprint's proposal the clearing target would be reduced even if the non-reserve-eligible bidders would have been willing to pay more. There would be no way to determine whether the failure was due merely to the reserve.⁷⁴ Moreover, Sprint provides no details about how the Commission would manage the myriad issues raised by such a fundamental re-design of the reserve auction.⁷⁵

Need for Explicit Cap on Subsidies. All of these concerns reinforce the fundamental point that the reserved auction opens the door to enormous mischief, both in the form of manipulative bidding that could undermine the integrity of the auction and unreasonably large windfalls to favored competitors. If these unintended consequences tilt the auction too far in favor of the reserve-eligible bidders, the Commission will not achieve the objectives Congress intended. As the recent AWS-3 auction dramatically confirmed, rules designed to create intra-auction subsidies between bidders can result in large, unintended, and even multi-billion-dollar windfalls if the Commission has not placed reasonable limits on such subsidies at the outset.

⁷² Sprint Comments at 47-48.

⁷³ Haile-Kearns-Dworkin Reply at 7.

⁷⁴ *Id.*

⁷⁵ *Id.*

Accordingly, rather than tilting its current open-ended reserve auction opportunities even further in favor of large, well-funded competitors like T-Mobile and Sprint, the Commission should consider ways to *cap* the reserve-related subsidies in advance, to ensure that the auction's end results appropriately balance all of the relevant concerns and interests, including those of the public. There are a variety of potential mechanisms that would ensure that bids in the reserve auction maintain a reasonable and rational relationship to the bids in the unreserved auction. AT&T has already proposed certain modifications ensuring that reserve-eligible bidders cannot strategically drive up unreserved bids while freezing bids in the reserve auction.⁷⁶ AT&T looks forward to working with the Commission to fashion additional modifications to make sure the reserve-related subsidies stay within reasonable bounds.

III. ADDITIONAL AUCTION PROCEDURES.

Commenters also raise several significant procedural issues relating to bidding units, activity rules, activity waivers, timing, and geographic contiguity.

Bidding Units. The Commission proposes to set bidding units for each PEA by weighting population by an index of relative prices, which incorporates the AWS-3 and other auction information.⁷⁷ Sprint proposes that the Commission instead set bidding units “based more closely on the actual POPs within the PEA, with increased bidding units/POP in the largest PEAs and reduced bidding units/POP in rural PEAs.”⁷⁸ AT&T supports this proposal. The problem with setting bidding units that weight population by relative prices from previous auctions is that this approach incorporates auction specific anomalies from prior auctions and does not necessarily reflect general market valuations for spectrum. Moreover, due to the unique

⁷⁶ Haile-Kearns-Dworkin at 42-44.

⁷⁷ Notice ¶ 162.

⁷⁸ Sprint Comments at 54.

nature of this incentive auction, the relative value of spectrum in different areas is likely to reflect a number of unique and complex factors that are not reflected in prior auction prices.

Demand Reduction. The comments show that the Commission should not adopt the proposal to not process bid reductions in demand for 5x5 spectrum licenses in a PEA as the price rises if the reduction would result in excess supply.⁷⁹ The comments show that this proposal would undermine incentives for bidders that want multiple 5x5 licenses. These bidders view 5x5 licenses as complements, and thus place greater value on each 5x5 license when purchased in pairs than when purchased alone. The proposed prohibition on demand reductions would introduce the “risk [of] being forced . . . to buy a single license at a price that exceeds its standalone value,” which would “be a further discouragement to aggressive participation by wireless providers whose valuations are heavily dependent on complementarities.”⁸⁰

Activity Requirement. The comments confirm that the Commission should consider activity rules below the 92-97 percent levels proposed in the *Notice*, at least in the early rounds.⁸¹ Given the unique complexity and uncertainty in this incentive auction, bidders will likely require more flexibility in the early auction rounds to acclimate and respond to the unique characteristics of what is predicted to be a far more dynamic and complex auction than any prior auction. Accordingly, AT&T supports activity rules closer to 80 percent in the early rounds.

Activity Waivers. The comments confirm that the Commission should reject the proposal to deny bidders a certain number of activity waivers.⁸² These waivers are essential. They work as a mechanism to ensure that a bidder who makes an honest error (or experiences a difficulty)

⁷⁹ See Haile-Kearns-Dworkin at 17; AT&T Comments at 46-47.

⁸⁰ Haile-Kearns-Dworkin at 17.

⁸¹ AT&T Comments at 48; Sprint Comments 50-53; CTIA Comments at 23.

⁸² Sprint Comments at 53; AT&T Comments at 48.

during the bidding process is not unduly punished. This is especially important here where the auction rules will likely be far more complex than any prior auction creating much greater potential for inadvertent violations of the activity rules.

Timing. AT&T agrees with the comments proposing that the Commission allow for more than two days between the reverse auction and the forward auction.⁸³ As CTIA and Sprint point out, substantial work will be required by both the Commission and by bidders that can only be done after the completion of the reverse auction. The Commission will have to develop provisional repacking assignments, present the band plan, and identify impairments. Bidders will need to evaluate the proposed band plan and impairment levels and develop a bidding strategy. AT&T thus agrees that the Commission should permit between 5 and 10 business days between the reverse and forward auctions.⁸⁴

Assignment Round. T-Mobile argues that any common channels awarded during the assignment phase should not be any larger than 20 contiguous PEAs or three adjacent MEAs.⁸⁵ This proposal should be rejected. As T-Mobile admits, contiguous spectrum across geographies can “reduce complexity, lower costs, increase reliability of devices, and accelerate network deployment,”⁸⁶ reducing technical challenges that “will allow broadband operators to more readily provide consumers with greater coverage and capacity,” “less complex and more reliable

⁸³ See Sprint Comments at 50; CTIA Comments at 15; T-Mobile Comments at 36-39.

⁸⁴ For these same reasons, AT&T supports the proposal to allow for 5-10 business days between the clock auctions and the assignment rounds. See Sprint Comments at 50; CTIA Comments at 15.

⁸⁵ T-Mobile Comments at 48-49.

⁸⁶ *Id.* at 47-48; see also *id.* at 47 (geographic contiguity provides significant benefits including reducing technical challenges that “will allow broadband operators to more readily provide consumers with greater coverage and capacity,” “less complex and more reliable inter-cell handoff at the license boundaries,” and “more efficient handset design”).

inter-cell handoff at the license boundaries,” and “more efficient handset design.”⁸⁷ Limiting the potential for geographic contiguity can only reduce the value of spectrum in the auction, which again is likely to reduce potential clearing targets.

Opening Prices For New Clearing Targets. Under the Commission’s proposed rules, the opening prices for each new clearing target will be set at the levels from the previous round of bidding.⁸⁸ T-Mobile and CCA purport to have identified a “bug” in the bidding procedures and instead suggest that the Commission “roll back” prices to levels below those in the previous round when setting opening prices for new clearing targets. As Professors Kearns and Haile and Ms. Dworkin explain, however, these proposals “are not accompanied by lucid economic reasoning or any discussion of how the proposed changes would alter bidding incentives” that “introduce new problems.”⁸⁹ They explain that “[a]ny auction offering to roll back prices in response to clearing target failures is likely to introduce perverse bidding incentives incompatible with the Commission’s objectives” among bidders who would know that prices could be lower in the next round if they allow the auction to fail at the current clearing targets.⁹⁰

⁸⁷ *Id.*

⁸⁸ *See Notice*, Appendix G; *see also generally* T-Mobile Comments at 44-45.

⁸⁹ Haile-Kearns-Dworkin Reply at 4.

⁹⁰ *Id.*

CONCLUSION

For the foregoing reasons, the Commission should not adopt the proposals set forth in the *Notice* and should provide sufficient detail and data for the public to effectively assess the impact of these and other proposed auction rules.

Respectfully Submitted,

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ATTACHMENT A

Reply Comments on the FCC's
Current Incentive Auction Design Proposal

Philip A. Haile, Michael Kearns and Lili Dworkin¹

March 13, 2015

¹Haile is the Ford Foundation Professor of Economics at Yale University. Kearns is Professor and National Center Chair, Department of Computer and Information Science at the University of Pennsylvania. Dworkin is a doctoral candidate in Computer and Information Science at the University of Pennsylvania. Our comments are provided on behalf of AT&T.

1 Introduction

Our original comments¹ raised a number of concerns with the Commission’s current incentive auction design proposals. In this brief document we provide reply comments on the filings of other parties.

Regarding the reverse auction, we note that our primary concerns—that the proposed clearing target optimization process and Dynamic Reserve Pricing would “bake in” widespread national impairments in the 600 MHz band, and that such impairments are unnecessary to clear large amounts of spectrum—were widely supported and echoed in the comments filed by a diverse set of parties, including several with competing interests. Taken collectively, our comments and the other filings present strong arguments against the design components giving rise to impairments. We thus devote the bulk of this document to reply comments regarding the forward auction.

We focus on two broad sets of comments. The first addresses harm to the functioning of the forward auction that would result from the impairments and license heterogeneity introduced by the Commission’s proposed reverse auction procedures. Other commenters clearly share this fundamental concern, and their comments support our view that the Commission should step back from the debate about how best to accommodate these impairments and instead avoid creating them in the first place. The second set of comments involves proposals to further tilt the auction in favor of reserve eligible bidders by setting aside more and better spectrum in the reserve, triggering the reserve sooner, and reducing competition for reserved licenses. Accepting any of these proposals would cause further departures from the basic principle of allocating spectrum to those who value it most highly. Many of these proposals would also have unintended consequences creating additional harm to the functioning of the auction.

¹Philip A. Haile, Michael Kearns, and Lili Dworkin, “Comments on the FCC’s Current Incentive Auction Design Proposals,” *Attachment A to Comments of AT&T*, AU Docket No. 14-252, GN Docket No. 12-268, February 20, 2015 (henceforth “Haile-Kearns-Dworkin”).

2 Forward Auction

2.1 Uncertainty and Complexity

Many commenters on the forward auction share our overriding concern regarding impairments and license heterogeneity. These are problems that would be introduced by the Commission’s reverse auction procedures, but much of their adverse effect would be felt in the forward auction. Sprint, for example, names as its greatest concern the fact that “bidders will not know what they are bidding on” in the forward auction.²

Some of the specific forward auction proposals from other commenters are really echoes of this fundamental concern. These include proposals regarding prioritization (e.g., of vertical contiguity) in the assignment phase.³ If there were a single factor determining efficiency of license allocations among clock-phase winners, strict prioritization of this factor would improve outcomes. Such improvement would arise not only from ensuring an efficient assignment among a given set of winners, but also from elimination of bidder uncertainty that could interfere with efficient determination of winners through the clock phase.

Unfortunately, there is no single factor determining the set of efficient allocations, even fixing the set of winners. Rather, under the Commission’s current plans, the set of efficient allocations will depend not just on complementarities arising from horizontal and vertical contiguity, but also on the ways in which license impairments within and across PEAs align with the particular needs of the winning bidders and the combinations of winnings each achieves in the clock phase. Therefore, even before considering the complex ways in which fine details of the assignment phase can influence the set of winning bidders, it is not clear that strict prioritization of any single factor is likely to improve outcomes. Rather than evaluating which type of band-aid might help, however, the Commission should first seek to avoid

²See *Comments of Sprint Corporation*, AU Docket No. 14-452, GN Docket No. 12-268, February 20, 2015 (henceforth, “*Sprint Comments*”) at *ii*.

³See *Comments of T-Mobile USA, Inc.*, AU Docket No. 14-452, GN Docket No. 12-268, February 20, 2015 (henceforth “*T-Mobile Comments*”) at 46–49 and *Comments of Competitive Carriers Association*, AU Docket No. 14-452, GN Docket No. 12-268, February 20, 2015 (henceforth “*CCA Comments*”) at 34–41.

creating injury through its reverse auction procedures. Only after the Commission has found ways to substantially reduce impairments and variation across nominally generic licenses does it make sense to consider whether priority for certain types of frequency contiguity should be imposed in the assignment phase.

A related issue is the significant uncertainty and risk the Commission would create by adopting a complex untested spectrum reserve procedure. The Commission's auction experts originally proposed a simple transparent competitive mechanism based on well established principles of auction design and more than two decades of experience with U.S. spectrum auctions.⁴ The current proposal deviates substantially from the original, both from the details of the auction rules and from the underlying principle of open competition for generic licenses. Further, it does so by tacking on a range of *ad hoc* alterations, often following suggestions of the same parties seeking special treatment in the auction. Separate from any question about the goals motivating these departures are questions about hidden defects in the resulting auction design. Despite the best efforts of the Commission's highly capable auction experts, no one can be certain that all major flaws in the auction design have been anticipated, much less that their risks to the auction have been adequately assessed.

A case in point may be offered by comments of T-Mobile and the Competitive Carriers Association ("CCA") asserting the need to roll back prices following failure of a clearing target in order to preserve the goals of the spectrum reserve.⁵ The proposals themselves are not accompanied by lucid economic reasoning or any discussion of how the proposed changes would alter bidding incentives. However, if there is indeed an auction design "bug" requiring a fix, this particular proposal is likely to introduce new problems. Any auction offering to roll back prices in response to clearing target failures is likely to introduce perverse bidding incentives incompatible with the Commission's objectives. The Commission should

⁴Paul Milgrom, Lawrence Ausubel, Jonathan Levin and Ilya Segal, *Incentive Auction Rules Options and Discussion*, Appendix C to the FCC's Notice of Proposed Rule Making, GN Docket No 12-268, October 2, 2012.

⁵*T-Mobile Comments* at 43-46; *CCA Comments* at 32-33.

certainly avoid fixing anything that is not broken. And any discovery of a fundamental design flaw requiring a fix at this late stage should be taken as a serious caution about the risks of unintended consequences arising from efforts to depart from competitive allocation of licenses and instead engineer market structure through a spectrum auction.

2.2 Spectrum Reserve

There were many comments on behalf of reserve eligible bidders (“REBs”) regarding the implementation of the spectrum reserve. In most cases, the goal of these proposals is transparent: to further tilt the auction in favor of REBs in general, and in favor of two large national carriers—Sprint and T-Mobile—in particular.

The Commission elected to introduce a spectrum reserve in the forward auction in order to address concerns about foreclosure of competition by AT&T and Verizon. The Commission’s stated objective is to ensure that other wireless carriers can obtain licenses at fair market prices—prices that fully reflect the spectrum’s use value but are not inflated by any additional value large firms might obtain from foreclosing others’ access to low-band spectrum. In response, the Commission agreed to set aside a significant share of the 600 MHz wireless band for restricted competition among bidders with limited low-band spectrum holdings.

The largest beneficiaries of the spectrum reserve will almost certainly be Sprint and T-Mobile. These firms will be reserve-eligible in all PEAs and will be the only nationwide wireless carriers eligible for reserved licenses in most major PEAs. These two firms are likely to win a large majority of reserved licenses, particularly in the markets where spectrum is most valuable. A number of comments on behalf of Sprint and T-Mobile ask that the reserve set-aside be made more generous or that the reserve rules be altered in ways that would further suppress prices of reserved licenses. We discuss specific proposals below. Accepting any of these proposals would cause further compromise of what even T-Mobile calls “The lynchpin of the Commission’s competitive bidding rules . . . that spectrum auctions

should place licenses in the hands of those who value them most highly.”⁶ And many of these proposals would also have unintended consequences creating additional harm to the well-functioning of the auction.

2.2.1 “Set Aside More Licenses... and the Best Ones”

Sprint, T-Mobile, and the Competitive Carriers Association (“CCA”) encourage the Commission to set aside 40 MHz of spectrum in the reserve instead of the planned 30 MHz.⁷ They further ask that the Commission include Category 2 spectrum in the reserve when there is insufficient Category 1 spectrum to fill it, and that the Commission include in the reserve the least impaired licenses in each PEA.⁸ The goal of these recommendations is clear: to protect from competitive allocation the greatest quantity and quality of spectrum possible, enhancing the windfalls to REBs—Sprint and T-Mobile in particular.

These proposals would create additional harms to the auction as well. Unless the Commission adopts our previous recommendation to trigger the reserve only when prices reach fair market values,⁹ these proposals would virtually guarantee that only REBs have access to the best spectrum in each PEA, and to an even larger share of the 600 MHz licenses. Designing such an extreme allocative distortion into the auction rules would risk substantial reductions in the benefits wireless consumers ultimately obtain from the 600 MHz wireless band. Further, leaving only the worst licenses for non-REBs would harm not only revenues (and, therefore, U.S. taxpayers) but also spectrum clearing. Without some possibility of obtaining one of the best licenses, non-REBs will never accept prices in the clock phase above the value of the worst licenses. Thus, limiting open competition to the most impaired licenses would limit clock-phase revenue and, therefore, the quantity of spectrum ultimately

⁶*Comments of T-Mobile USA, Inc.*, WT Docket No. 14-170, GN Docket No. 12-268, RM-11395, WT Docket No. 05-211, February 20, 2015, at 2.

⁷*Sprint Comments* at footnote 68; *T-Mobile Comments* at 2–4; *CCA Comments* at 28–29.

⁸*T-Mobile Comments* at 6–8; *Sprint Comments* at footnote 76; *CCA Comments* at 19–21.

⁹Haile-Kearns-Dworkin at 12–14.

cleared.

Finally, the Commission should be particularly resistant to the proposal to have four reserved licenses in each PEA, due to the resulting ease with which Sprint and T-Mobile could simply split the reserved spectrum between them with little or no competition in many PEAs. In the majority of major PEAs, Sprint and T-Mobile should be expected to win all reserved licenses. With a 30-MHz reserve the Commission could nonetheless hope for competition between these two dominant REBs, at least in PEAs where both seek two licenses. With a 40-MHz reserve, however, the price of reserved spectrum would be disciplined only by the bidding of smaller REBs and the Commission's trigger for implementing the reserve.

2.2.2 “Trigger the Reserve Sooner”

In our own comments we explained why the Commission should not assign licenses to “reserved” status before auction prices reach fair market values.¹⁰ Triggering the reserve too soon risks distorting the spectrum allocation beyond what can be justified by the Commission's stated objectives. And there is ample evidence that the Commission's proposed trigger price of \$1.25 per MHz-Pop (in high-demand PEAs) is far below fair market values, likely by more than 50 percent. However, the carriers mostly likely to benefit from premature trigger of the reserve argue for triggering the reserve at even lower prices.

T-Mobile suggests that the \$1.25 threshold apply only to top-25 PEAs rather than Top-40 PEAs.¹¹ This proposal would only widen the discrepancy between the Commission's goals and the implications of its reserve design. T-Mobile is right in arguing that “The auction process, rather than the Commission, should determine the price for 600 MHz band spectrum,”¹² but what T-Mobile actually proposes is a further departure from this principle. T-Mobile asks the Commission to choose even lower prices at which to *cut off* open

¹⁰Haile-Kearns-Dworkin at 12–14.

¹¹*T-Mobile Comments* at 39–41. CCA (*CCA Comments* at 31–33) proposes that the minimum trigger price be zero.

¹²*T-Mobile Comments* at 41.

competition in order to ensure allocation of reserved licenses to REBs, regardless of their willingness to pay fair market prices. Indeed, implicit in T-Mobile's remark (quoted above) is acknowledgement that there will be little competitive pressure on prices for reserved licenses once the reserve is triggered: otherwise the price of reserved licenses would be determined by competition among REBs, not by the price at which AT&T and Verizon are first excluded from this competition.

Sprint suggests that the auction *begin* with the reserve in place, only retracting the reserve later when total REB demand remains below the supply of reserved licenses for some period.¹³ This may seem similar to T-Mobile's proposal, only with a larger deviation between fair market values and the reserve trigger. In fact, however, Sprint's proposal would involve abandoning safeguards limiting unnecessary failures of clearing targets due to the spectrum reserve. And while Sprint's proposal would involve a major alteration of the auction design, Sprint provides no details, leaving open very serious questions about how the Commission could manage the required reassignments of licenses from reserved to unreserved status without creating undersell, price rollbacks, expansions of bidder eligibility, and perverse bidder incentives.¹⁴

What is clear is that Sprint's proposal would introduce substantial new risk of clearing target failures. Sprint suggests reducing the reserve at some point if demand for reserved licenses is below supply. But this would not protect against target failures caused by the reserve. Reserve demand could equal or exceed supply at prices too low to satisfy the final stage rule, regardless of the prices non-REBs would be willing to pay for the set-aside licenses. Under Sprint's proposal, the clearing target would be reduced in such situations without any attempt to determine whether the target failure was the result of setting aside too many licenses.¹⁵ To minimize the extent to which the reserve leads to failures of clearing

¹³*Sprint Comments* at 47–48.

¹⁴Similar questions arise from the suggestion of CCA (*CCA Comments* at 23–24) and T-Mobile (*T-Mobile Comments* at 8–9) that the size of the reserve be expanded to equal the total (over all Categories) REB demand at the time of the reserve trigger.

¹⁵Sprint's proposal would prevent anyone's learning whether a target failure was due to the reserve,

targets, the reserve must not be triggered before the final stage rule has been satisfied.

2.2.3 “Commit Us to Limited Competition in the Reserve”

T-Mobile and CCA encourage the Commission to limit REBs to no more than 20 MHz of reserved spectrum each.¹⁶ This may sound like a reasonable proposal ensuring diversity in the allocation of reserved licenses. But a cap on reserved spectrum can serve a much more nefarious role by softening competition between reserve-eligible bidders who might otherwise compete vigorously for multiple reserved licenses. Softening of competition takes its most extreme form under outright collusion, where bidders find ways to limit head-to-head competition and suppress prices. A challenge to potential colluders, at least when collusion is illegal, is finding ways to *commit* to withholding demand when the suppression prices will create tempting opportunities. Were the Commission to impose the 20 MHz cap, it would be helping REBs to keep prices low in the same way, although without the necessity of collusion: the auction rules would provide commitment to limited demands. In an extreme case (one proposed by T-Mobile and Sprint), if there were four reserved licenses and two dominant reserve-eligible bidders, committing to demand no more than 2 licenses apiece is a way to completely avoid head-to-head competition—a way to enforce a perfectly collusive outcome at no cost and without breaking any law. Even with three reserved licenses, a cap on the demands of REBs would help them limit competition for reserved licenses, keeping prices low. This would not affect the number of reserved licenses won by REBs, but would simply offer REBs windfall prices at the expense of U.S. taxpayers. The Commission should reject this proposal and let competition and arbitrage drive prices to their natural levels subject to the limits already implied by setting aside licenses in the reserve.

avoiding any opportunity for the Commission to obtain data on the real tradeoffs between auction set-asides and auction revenues.

¹⁶ *T-Mobile Comments* at 4–5; *CCA Comments* at 27–28.

2.2.4 “Let Us Collude”

Sprint and T-Mobile ask that the Commission allow joint bidding by firms currently holding licenses for less than 45 MHz of low-band spectrum in a PEA.¹⁷ Such a policy would, in particular, permit joint bidding by Sprint and T-Mobile in all PEAs. This proposal should be recognized for what it is: an attempt to further distort the auction in ways that uniquely benefit Sprint and T-Mobile.

Joint bidding is just another name for bidder collusion or bid rigging, i.e., an arrangement by which bidders coordinate to avoid competing with each other and obtain more favorable prices for themselves. Collusion in auctions is generally illegal, and auction experts view avoidance of collusion as critical to a successful auction. For example, in an influential article describing the essentials of good auction design in general and errors made in early European spectrum auctions in particular, Professor Paul Klemperer writes¹⁸

“Just as damaging has been the European authorities’ acceptance of joint bidding agreements that are, in effect, open collusion.”

Indeed, legal sanctioning of collusion is likely to facilitate especially effective anti-competitive behavior, since there is then no need for the bidding ring to evade detection.

The Commission should therefore be exceedingly suspicious of any claim by bidders that allowing them to bid jointly would lead to better auction outcomes. A request to permit joint bidding is a request to permit collusion. And in an ascending auction, collusion benefits the joint bidders at the expense of auction revenues. In the Commission’s forward auction, revenues are of direct interest to U.S. taxpayers but are especially important through their indirect role in determining how much spectrum is reallocated. Any suppression of forward auction prices will lead to reduced spectrum re-allocation. Economists have given a great

¹⁷*Comments of Sprint Corporation*, WT Docket No. 14-170, GN Docket No. 12-268, RM-11395, WT Docket No. 05-211, February 20, 2015; *Comments of T-Mobile USA, Inc.*, WT Docket No. 14-170, GN Docket No. 12-268, RM-11395, WT Docket No. 05-211, February 20, 2015.

¹⁸Paul Klemperer (2002), “What Really Matters in Auction Design,” *Journal of Economic Perspective*, 16, 69–189.

deal of attention to collusive bidding and have identified narrow exceptions to the general rule that collusion harms revenue. This is possible, for example, when collusion substantially reduces the severity of the winner’s curse.¹⁹ However, these special circumstances should not be expected to hold in the Commission’s forward auction. Sprint and T-Mobile themselves make no claim to the contrary and offer no coherent argument that collusion would have anything other than the usual anti-competitive effects.

Collusion harms revenues by enabling the joint bidders to internalize competitive externalities and avoid competing with each other. Under a joint bidding arrangement Sprint and T-Mobile would coordinate to avoid head-to-head competition whenever possible. The primary goal of such an arrangement is to suppress the prices paid by the coordinating bidders. This coordination would be effective for any license—reserved or unreserved—for which Sprint and T-Mobile are viable competitors. It is likely to be especially effective for reserved licenses, since in most major markets the two strongest competitors to Sprint and T-Mobile will already be excluded from competition. A joint bidding agreement would then effectively allow Sprint and T-Mobile each to eliminate its strongest remaining competitor for reserved licenses.

The damage of joint-bidding agreements is especially severe in *multi-unit* uniform price auctions, like the Commission’s forward auction, due to the effect of joint bidding arrangements on “demand reduction.”²⁰ Bidders in the auction will generally have some incentive to withhold demand for a second (or third) unit of given license, since this demand could drive up the price the bidder pays for its first unit. However, with joint bidding such demand reduction incentives are magnified several-fold. For example, Sprint would know that if it aggressively demands a second license in some PEA, this could drive up the cost of

¹⁹See, e.g., Vlad Mares and Michael Shor (2008), “Industry Concentration in Common Value Auctions: Theory and Evidence,” *Economic Theory*, 35: 37–56; and Vlad Mares and Michael Shor (2012), “On the Competitive Effects of Bidding Syndicates,” *The B.E. Journal of Economic Analysis and Policy, Frontiers*, 12, 1, article 35.

²⁰Early insights on this point can be found in Dan Levin (2004), “The Competitiveness of Joint Bidding in Multi-Unit Uniform-Price Auctions,” *RAND Journal of Economics*, 25, 375–385.

T-Mobile's first license in this PEA, or that of T-Mobile's second license. With competitive bidding, Sprint would ignore this externality and compete away. But joint bidding allows Sprint and T-Mobile to negotiate to avoid this outcome, holding prices down by design. Of course there would be a symmetric force discouraging aggressive bidding by T-Mobile as well. The two firms, if allowed to bid jointly, would therefore not merely avoid head-to-head competition for individual licenses, but would have strong incentives to withhold demand that could drive up the price of any license either firm is likely to win.

It is understandable that Sprint and T-Mobile would like the Commission to approve a joint-bidding arrangement. *Any* bidder would like to first exclude its strongest competitors (through creation of the "spectrum reserve") in most major markets, and then coordinate with its strongest remaining competitor. Here this would enable Sprint and T-Mobile to claim reserved licenses at windfall prices in many or most major PEAs. But allowing this would not serve any Commission interest. In fact, to the extent that Sprint and T-Mobile are likely to compete for unreserved licenses at all, joint bidding would again tend to reduce—not enhance—the aggressiveness of bidding by the two firms: coordination does not enhance bidders' license valuations or provide them "deeper pockets." Coordination would allow the two firms to avoid driving up each others' costs and coordinate on threats to deter entry, but it offers no plausible mechanism for buttressing their competitiveness for unreserved licenses.

Suppression of competition is clearly not in the Commission's interest, since it would ultimately lead to reductions in the quantity of spectrum available to wireless carriers. Among forward auction participants, the burden of such reductions falls almost entirely on non-reserve-eligible bidders, who will see cuts in the number of unreserved licenses while (at least under the Commission's current proposals) the number of reserved licenses is untouched. Again, it is easy to understand why Sprint and T-Mobile would be happy with such an outcome, but inefficient reductions in spectrum clearing are contrary to the central goals of the Commission's auction.