May 15, 2015

By ECFS

Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C. 20554

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

Dear Ms. Dortch,

AT&T Inc. (“AT&T”) respectfully submits the attached paper1 by Philip Haile, Ford Foundation Professor of Economics at Yale University, entitled “Comments on the FCC’s Proposed ‘No Excess Supply’ Rule For the 600 MHz Spectrum Auction.” This paper expands on Professor Haile’s prior submission2 demonstrating that the Commission should reject the proposed auction rule that would “not allow a bidder to reduce the quantity of blocks it demands in a category if the reduction will result in aggregate demand falling below the available supply of licenses in the category.”3 Professor Haile calls this the “No Excess Supply” or “NES” restriction.

As explained by Professor Haile, there are two fundamental problems with the NES restriction. First, for many bidders, licenses are complementary, which means that their per-license valuations are higher for pairs of licenses than for a single license. The NES restriction, however, “makes it dangerous for a bidder to risk bidding any price above” its lower single-

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license valuation, because doing so creates “substantial risk of being forced to choose between two money-losing options: (1) purchase a single license at a price exceeding its standalone value; or (2) buy the pair of licenses at a total price exceeding their value.” As a result of this “exposure risk,” bidders will bid more conservatively and drop out of the bidding earlier. As a result of this “exposure risk,” bidders will bid more conservatively and drop out of the bidding earlier.6 Second, the NES restriction blocks efficient auction outcomes. In an efficient auction, bidders naturally alter their spectrum acquisition targets to account for differences in prices as the auction progresses.6 The NES restriction undermines this efficient reallocation, by blocking bidders from moving demand out of a PEA. In so doing, it also sends false signals to other bidders about actual demand in that PEA, resulting in further inefficiencies.

Given the substantial harms caused by the NES restriction, it should be adopted only if there are substantial offsetting benefits. The Notice identifies only two potential benefits: (1) facilitating progress towards the final stage rule (“FSR”) and (2) avoiding falling below the FSR after it has been crossed. But as Professor Haile explains, the NES would apply even where the NES would serve neither of these goals (i.e., where the FSR has already been crossed and where processing the quantity reduction would not cause auction revenues to fall below the FSR), thus causing all of the harms and none of the intended benefits. Moreover, Professor Haile shows that NES restrictions are more likely to impede progress to the FSR than facilitate it.

If the Commission nonetheless determines that limits on excess supply are needed to address specific potential harms to the auction, the Commission should establish narrow restrictions that serve their intended purpose while reducing exposure risk and inefficient market signals. In this respect, Professor Haile suggests that “the Commission should consider permitting limited excess supply (e.g., up to one license), providing bidders with a limited number of waivers that permit two-unit quantity reductions that result in (one unit of) excess supply, and providing bidders with simple signals – notifications that an all-or nothing bid is being blocked – that would facilitate efficient movements of demand as the auction proceeds.”

Respectfully submitted,

/s/ Christopher T. Shenk
Christopher T. Shenk
Counsel for AT&T

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4 Haile Paper at 3.
5 Id. at 3-4.
6 Id. at 4.
7 See Notice ¶ 176.
8 Haile Paper at 2, 8-10.
Comments on the FCC’s Proposed
“No Excess Supply” Rule
For the 600 MHz Spectrum Auction

Philip A. Haile∗

May 15, 2015

1 Introduction

In this filing I expand on my prior analysis1 of the Commission’s proposal to “not allow a bidder to reduce the quantity of blocks it demands in a category if the reduction will result in aggregate demand falling below the available supply of licenses in the category.”2 This rule is a restriction on the way bidders may respond to rising prices during the auction. A bidder may reduce the quantity it demands by one unit in response to each price increase; but a bidder’s request to reduce its quantity demanded by two units would be fully processed only if excess demand remained after removal of the bidder’s first unit of demand.3

∗I am the Ford Foundation Professor of Economics at Yale University. These comments are provided on behalf of AT&T.


3More generally, a bidder’s request to reduce quantity demanded by $K$ units would be fully processed only if excess demand remained after removal of the bidder’s first $K−1$ units of demand.
simplicity, I will refer to this policy as a “no excess supply” (or “NES”) rule.

The proposed NES rule would interfere with the normal functioning of a multi-good auction process, under which bidders can freely adjust the quantities they demand as prices rise. This rule would directly block efficient reallocation of demand during the auction. In doing so, it would also create substantial exposure risk for bidders who, when hoping to acquire a pair of complementary licenses, may find themselves instead forced to buy a single license at a price exceeding its standalone value. This added exposure risk rule will suppress bidding, limit revenue, and further harm the efficiency of the final spectrum allocation.

These harms are unlikely to be offset by any benefits from the NES rule. The PN identifies two reasons for imposing the restriction: (1) to facilitate progress toward satisfaction of the final stage rule (“FSR”) and (2) to avoid falling below an FSR revenue threshold after it has been crossed. However, one cannot threaten bidders with forced purchases and expect them to bid as aggressively as if there were no such threat. Consequently the NES rule is more likely to harm the Commission’s stated objectives than to promote them. Furthermore, the Commission proposes to impose the NES rule even when the FSR has already been met and full bid processing would not reverse satisfaction of the FSR. In those circumstances, application of the NES rule produces all of the harms but none of the stated benefits.

For these reasons, I believe that the Commission should reject the proposed NES rule. If the Commission determines that limits on excess supply are needed to address specific potential harms to the auction, the Commission should tailor such restrictions to address those specific harms, avoiding blanket prohibitions like the NES rule. In such cases, the Commission should also consider policies that limit the resulting exposure risk and inefficiencies that would result. Specifically, as I explain below, the Commission should consider permitting limited excess supply (e.g., up to one license), providing bidders with a limited number of waivers that permit two-unit quantity reductions that result in (one unit of) excess supply, and providing bidders with simple signals—notifications that an all-or-nothing bid is being blocked—that would facilitate efficient movements of demand as the auction proceeds.
2 The Substantial Harms of the NES Rule

The proposed NES rule would create two fundamental problems: (1) exposure risk and (2) inefficient allocation of licenses. Both problems discourage auction participation, discourage aggressive (efficient) bidding competition, and create greater potential for auction failure.

2.1 Exposure Risk

For many bidders, individual 5×5 MHz licenses in a given PEA are complementary. That is, many bidders who place a value of $x on a single 5×5 MHz license will value a pair of such licenses at substantially more than $2x. The NES rule, however, makes it dangerous for a bidder to risk paying any price above $x per license. This is because doing so puts the bidder at substantial risk of being forced to choose between two money-losing options: (1) purchase a single license at a price exceeding its standalone value; or (2) buy the pair of licenses at a total price exceeding their value.

An example illustrates the problem. Consider a PEA in which there is a bidder valuing a single 5×5 MHz license at $1.00 (prices in this example are per MHz-POP) while valuing a pair of 5×5 MHz licenses at $3.00. If the bidder remains in the auction even when the price crosses the $1.00 threshold, it takes on exposure risk. If the price reaches $1.50, the bidder must drop out completely to avoid a loss. But unless there is excess supply of at least 2 units at the price of $1.50 (something the bidder will not know in advance), the request to drop out completely will be denied. The bidder will then have two options. The bidder may accept a single license at the price of $1.50—well above its valuation for a singleton license. Alternatively, the bidder can place an “all-or-nothing” bid to reduce bid quantity by two licenses. This latter option is highly risky. Such a bid would not be processed unless other bidders increase their bid quantities in that PEA while the price keeps rising. There is therefore substantial risk that the all-or-nothing bid will never be processed and that the bidder will be forced to pay far more than its valuation of $3.00 for the pair.

As is well understood, bidders will seek to reduce their exposure risk by bidding conservatively—
demanding a single license instead of a pair, dropping out of the bidding early to avoid the downside risk, or simply staying out of bidding altogether in many PEAs. Often this will mean that a bidder who could have won its desired pair of licenses will fail to do so, due only to the excess caution necessitated by the auction design. Thus, as I have previously discussed, the NES rule will discourage participation and competition in the auction, harming both efficiency and revenue.

2.2 Inefficient Price Discovery and Demand Reallocation

As the auction proceeds, bidders will naturally want to adjust the set of licenses they pursue. Prices will turn out to be higher than expected for some licenses of interest but lower than expected for others. Bidders will therefore naturally alter their spectrum acquisition targets. A primary goal of the auction is to facilitate this process of price discovery and efficient reallocation of bidding interest.

The NES rule would interfere with this process. First, failure to process a two-unit quantity reduction directly blocks a bidder from moving its demand from one PEA to another, even when doing so would produce more efficient auction outcomes. Second, blocking a two-unit all-or-nothing bid harms other bidders—those who might want to move their demands to this PEA—by sending a misleading message. It creates the false impression that competition for licenses remains strong (after all, price is rising) when in fact the market might clear at the current price if one bidder shifted a single unit of demand to this PEA. Thus, in many instances in which the NES rule would be applied, there will be other bidders who would willingly move demand to the PEA in question if the auction were giving the correct signals. By instead signaling that demand exceeds supply when the true quantity bidders wish to purchase is less than supply, the auction design interferes with at least two types of demand adjustments required for efficiency—that of the bidder seeking to move out

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4See, for example, the extensive discussions of the exposure problem in Peter Cramton, Yohav Shoham and Richard Steinberg (eds.), *Combinatorial Auctions*, MIT Press, 2010.

5Haile-Kearns-Dworkin at 17.
of the PEA and that of the bidders who would move into it. This directly interferes with efficiency while compounding the exposure risk faced by bidders contemplating bids for pairs of licenses.

3 What Offsetting Benefits?

Given the certain and substantial harms that would be caused by the NES rule, it should be adopted only if there are certain and substantial offsetting benefits. The only benefits referenced in the PN are that the rule is needed to avoid:6

(1) “risk[ing] significant reductions in aggregate forward auction proceeds from round to round, impeding progress toward the final stage rule” and

(2) “potentially undermin[ing] a prior determination that the final stage rule had been satisfied.”

However the proposed NES rule would be applied even when full processing of bids poses no threat to either objective. In such cases, the blanket prohibition of the NES rule produces all of the harms identified above but no identified benefit. One could limit application of the NES policy to circumstances in which the Commission’s stated objectives are actually at risk—i.e., to stages of the clock phase prior to satisfaction of the FSR, and to bids whose processing would cause reversal of the FSR criteria. But even then the policy has significant risk of harming the Commission’s objectives more than helping.

3.1 Progress Toward the FSR

The PN offers no argument that prohibition of two-unit quantity reductions will enhance progress toward satisfaction of the FSR criteria. In fact, it is likely to have the opposite effect.

Blocking a bid that creates excess supply does not imply enhanced progress toward an FSR. Temporary shortfalls in demand are a natural feature of a multi-unit multi-good clock

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6PN at 176.
auction, arising as bidders adjust to the evolving prices. Furthermore, a stopped clock will serve as a signal that will often attract demand from other bidders who were expecting prices in this PEA to continue rising. Upon seeing this signal, such bidders will often shift their demand, making shortfalls temporary. In addition, once the auction is well underway, bidders dropping demand for one set of licenses typically add demand for other licenses of comparable value, keeping the total value of their bids roughly constant as the auction proceeds. It is highly unlikely that interfering with this natural auction process would aid progress toward an FSR revenue threshold. However, as discussed above, the exposure risk caused by the NES rule will suppress bidding and, therefore, revenue. Thus the proposed NES rule threatens to cause rather than prevent failure to satisfy the FSR.

### 3.2 Avoiding FSR Reversals

The PN states that the NES rule is needed to avoid the potential for falling below a previously satisfied FSR revenue threshold. First, it is not clear that this is a serious risk. Prices are rising in each round of the clock phase, and it is unlikely that revenues would shrink from one round to the next as a result of the natural movements in demand that occur as the auction proceeds. Furthermore, by subjecting bidders to exposure risk in an effort to protect against unlikely reversals of an FSR, the Commission may simply depress bidding and ensure that the FSR is never reached in the first place. Thus, once again, the proposed NES rule seems more likely to impede the Commission’s objectives than to assist them.

Even if the Commission concludes that FSR reversals are an unacceptable risk, a much narrower intervention can completely address this issue: the NES restriction could be applied only when full processing of a bid would reverse a previously satisfied FSR. This restriction would eliminate any possibility of an FSR reversal while introducing little exposure risk for bidders. This is one example of a broader point: if the Commission concludes that some restrictions on bid processing are necessary, this should be done in a way that minimizes

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harm through better targeting of specific concerns.

4 Any Restrictions Should Be Narrowly Targeted

As I have explained, the proposed NES rule is an unnecessarily blunt instrument for the job of addressing the Commission’s stated concerns. If the Commission deems it necessary to adopt provisions limiting excess supply, it should do so in a manner that is narrowly targeted to address the specific concerns it has identified, and with safeguards to minimize the exposure risk and inefficiencies introduced through restrictions on bid processing. I offer some specific suggestions below.

4.1 Drop Restrictions that Create Harm with No Benefit

As discussed above, the NES restriction could not serve either of the Commission’s stated objectives when both (a) the FSR revenue threshold has already been crossed and (b) full processing of a bid would not cause revenue to fall back below this threshold. In those circumstances, application of the NES rule would produce all of the harms discussed above but would serve neither of the stated purposes of the restriction. Accordingly, the NES restriction should not apply in these circumstances.

As to the remaining circumstances, it is my view that applying the NES rule prior to satisfying the FSR would not facilitate progress to the FSR. For the reasons provided above, application of the NES rule is more likely to hinder progress toward the FSR revenue threshold than to promote it. This leaves only the circumstance in which a previously satisfied FSR would be reversed by full processing of a bid. As discussed above, I believe this is unlikely, and that any such FSR reversals would be very likely be temporary. However, to the extent the Commission views FSR reversals as an unacceptable risk, application of the NES rule should be limited to target this specific concern.
4.2 Permit Limited Excess Supply

If any limit is to be imposed on the processing of valid bids, this should be done in a way that limits the adverse effects on the auction. Allowing bids that create only limited excess supply is an approach that would protect against the Commission’s worst fears while limiting the harms to revenue and efficiency created by more severe restrictions.\(^8\) I suggest two approaches that might be taken.

4.2.1 Fully Process All Two-Unit Quantity Reductions

As explained above, the most significant problems that would be created by the NES rule arise from the threat of partial processing for bidders seeking pairs of licenses in the same PEA. This is what creates most (or all) of the exposure risk and direct interference with efficient reallocations of demand. These problems would be avoided if the auction allowed excess supply of a single license. This would be achieved through a policy of full processing of all bids involving two-unit quantity reductions.\(^9\) This approach would avoid much or all of the exposure risk, inefficiency, and revenue reduction that the full NES rule would create.\(^10\) At the same time, it would leave relatively little risk to the auction.

4.2.2 Tokens Granting Two-Unit Quantity Reductions

A narrower approach to allowing limited excess supply could be implemented by granting each bidder a limited number of “tokens” (allocated, say, in proportion to initial eligibility), each allowing the bidder to reduce its quantity demanded by two units when this would

\(^8\)If an unstated Commission concern is bidder gaming that could lead to substantial undersell or large swings in revenue, such threats would be prevented by permitting only limited excess supply.

\(^9\)In the case of simultaneous bids involving two-unit quantity reductions, the Commission could randomize which bid is fully processed, ensuring that demand never falls more than one unit below supply. However, given the proposed design for intra-round bidding, simultaneous bids (requests to reduce quantity at identical price points) should have negligible likelihood. Thus, the exposure risk resulting from the possibility of randomization would be negligible.

\(^10\)Of course, substantial exposure risk would still remain for bidders seeking complementary licenses either (i) across multiple PEAs or (ii) (if the Commission implements its proposal to offer separate spectrum Categories) across Categories within a single PEA. The Commission should also explore approaches to reducing the harm to the auction caused by these exposure risks.
create one unit of excess supply. Under this approach, when a bidder expresses a wish to reduce demand by two (or more) units and processing of this bid would result in excess supply, the bidder would be given the following options: (a) accept partial processing of the bid, or (b) reduce demand by two units, utilizing one token.

4.3 Information Policy

If any, even restricted, form of NES rule is to be imposed, the Commission should consider an information policy that facilitates efficient price discovery and management of exposure risk created by the restrictions. Specifically, the FCC could aid efficiency and partially mitigate exposure risk by making a public announcement whenever excess demand exists in a PEA only because of an all-or-nothing bid that was not processed.

An example illustrates. Suppose there are 6 licenses available in the Atlanta PEA and that demand at the current price \( p \) is 7 licenses. Further suppose that among the bidders demanding these licenses is one with an unprocessed all-or-nothing bid to reduce demand by two units. This “stranded” bidder would like to forgo Atlanta and instead bid elsewhere, but does not want to risk winning a singleton license in Atlanta. Meanwhile, there is a bidder not currently demanding a license in Atlanta that would happily pay \( p \) for an Atlanta license, but which is not bidding there because it expects the price to continue rising. That expectation will in fact be fulfilled: the price of an Atlanta license will rise, perhaps by a great deal, despite the fact that the true quantity demand is already less than supply at the price \( p \). Thus, the “replacement bidder” who could release the stranded bidder—making both better off—is given no signal that this unexpected profit opportunity exists.

This situation could be remedied at least partially by providing a public announcement that there is an unprocessed all-or-nothing bid in Atlanta. Upon seeing this announcement, a replacement bidder would know that there is a possibility of acquiring an Atlanta license at the current price: with the arrival of one unit of replacement demand, supply and demand in this PEA would be equated. Thus, a minor addition to the information provided to bidders (a binary signal indicating the presence of an unprocessed all-or-nothing bid) would
encourage efficient reallocation of demand in situations where multi-unit quantity reductions are being blocked.