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 U.S. Cellular’s Assignment Phase Proposals.” This paper responds to recent letters submitted by U.S. Cellular Corporation (“USCC”) identifying flaws in the Commission’s current proposal for the assignment phase of the 600 MHz forward auction, and proposing solutions.2 Although Professor Haile agrees that USCC has correctly identified important flaws in the proposed approach for the assignment phase of the auction, he demonstrates that USCC’s proposed solutions have flaws of their own and should not be adopted. Professor Haile identifies alternative approaches to address the problems identified by USCC that would result in a more successful auction.

The problem identified by USCC is that the proposed revenue-generating assignment phase could suppress bidding in the clock phase of the auction. Bidders in the clock phase will anticipate a need to make substantial payments in the assignment phase to avoid poor allocations,

and therefore their willingness to pay in the clock phase will be reduced.\textsuperscript{3} This is especially problematic in the 600 MHz incentive auction due to the potential for substantial heterogeneity of spectrum blocks (making the assignment round more important) and the crucial role of the clock phase revenue in determining the quantity of spectrum reallocated to mobile wireless use.\textsuperscript{4}

USCC’s main proposed solution is to conduct bidding in the assignment phase using a points-based system rather than a monetary-based system, which avoids siphoning dollars from the clock phase to the assignment phase. Professor Haile explains that a points-based system, in theory, could provide a good solution to the problem, but that the specific points-based systems proposed by USCC would likely produce inefficient outcomes that would also suppress clock auction revenues.\textsuperscript{5}

As explained by Professor Haile, USCC’s proposed points-based systems have a variety of flaws. USCC’s proposal to give each bidder the same number of points in each PEA would give a systematic and unwarranted advantage to bidders that have fewer feasible allocations.\textsuperscript{6} USCC’s alternative proposal, in which bidders would “score” their preferences in each PEA, would systematically disadvantage bidders seeking to build larger (e.g., 10x10 MHz) blocks of spectrum, and such a system also would not provide enough information about the intensity of bidders’ preferences.\textsuperscript{7} Under either of these USCC proposals, bidders seeking multiple licenses would have strong incentives to reduce their bids in the clock phase to account for the fact that they are less likely to obtain their desired allocations in the assignment phase, resulting in lower clock phase revenues. As Professor Haile explains, these sorts of “poorly designed points-based system[s] would suppress clock phase bidding, potentially more so than the current Commission proposal.”\textsuperscript{8}

As Professor Haile explains, however, the flaws in these proposals suggest the types of factors that the Commission should consider in designing a points-based system that would allow bidders to express their actual relative valuations for different assignments.\textsuperscript{9} Such a system would likely, among other features, include a fixed budget of points for winners to spread among

\textsuperscript{3} Haile Paper at 1-2.  
\textsuperscript{4} Id. at 2.  
\textsuperscript{5} Id. at 6-9.  
\textsuperscript{6} Id. at 7.  
\textsuperscript{7} Id. at 7-8.  
\textsuperscript{8} Haile Paper at 2. Professor Haile also explains that USCC’s alternative proposals – random allocations and random sequencing of PEA-by-PEA rounds – should not be adopted, because adopting those proposals would “destroy a great deal of spectrum value by denying bidders any opportunity to convey information about the value created by different assignments.” Id. at 1-2.  
\textsuperscript{9} Haile Paper at 9-11.
all of the blocks in all PEAs in which they won spectrum in the clock phase, and with the number of points given to each bidder being proportional to the sum of their winning clock phase bids.\textsuperscript{10}

Respectfully submitted,

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Christopher T. Shenk
\textit{Counsel for AT&T}

\textsuperscript{10} \textit{Id.} at 9-14.
Comments on U.S. Cellular’s Assignment Phase Proposals

Philip A. Haile\textsuperscript{1}

May 15, 2015

\textsuperscript{1}I am the Ford Foundation Professor of Economics at Yale University. These comments are provided on behalf of AT&T.
1 Introduction

I have been asked by counsel for AT&T to evaluate the merits of ideas sketched in a recent filing by U.S. Cellular Corporation ("USCC").\(^1\) USCC points out important flaws in the FCC’s current proposal for the assignment phase of the upcoming 600 MHz forward auction.\(^2\) In particular, they demonstrate that the proposed revenue-generating assignment phase could substantially suppress bidding in the clock phase of the auction.\(^3\) The problem arises because bidders in the clock phase would anticipate a need to make substantial payments in the assignment phase in order to avoid poor allocations. This would limit willingness to pay in the clock phase, especially among bidders for whom different feasible assignments generate very different value. The resulting suppression of clock phase bidding would lead to inefficient allocations and to reduced clock phase revenue. This is especially problematic in the upcoming 600 MHz auction due to (a) the substantial variation in impairments that will exist across nominally “generic” licenses and (b) the crucial role of clock phase revenue in determining the quantity of spectrum reallocated to mobile wireless use through the incentive auction.

USCC sketches two broad types of alternatives: quasi-random assignment or (its favored approach) an assignment phase using “points” rather than dollars. Both approaches would avoid the problem that a revenue-generating assignment phase would shift revenues out of the clock phase. A quasi-random system, however, would destroy a great deal of spectrum value by denying bidders any opportunity to convey information about the value created


\(^3\)Similar observations have been made previously in Philip 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”) at 7 and “Comments of Sprint Corporation,” AU Docket No. 14-252, GN Docket No. 12-268, February 20, 2015, at 29 and Appendix 1. These filings point out additional harms to efficiency and clock round revenue that would arise under the FCC’s current proposal due to the facts that (a) bidders differ in their tolerance for impairments and (b) clock round bids are sunk costs once the assignment phase begins.
by different assignments. Such an option should not be considered. However, I agree with USCC’s broader suggestion that a points-based assignment phase could offer a substantial improvement over the Commission’s current proposal.

But the devil is in the details. A poorly designed points-based system would suppress clock phase bidding, potentially more so than the current Commission proposal. USCC’s auction expert, Robert Weber, correctly points out that if the Commission chooses to adopt a non-revenue-generating assignment phase, “there remain interesting questions concerning the best alternative.” ⁴ Although USCC has provided only a sketch of possible approaches, I see significant problems with the specific designs they describe. Neither of these specific proposals should be adopted. Nonetheless, at a broad level I view the idea of a points-based assignment phase as promising, and I encourage the Commission to explore such an approach in conjunction with the principles discussed in Section 4.3 below.

As a separate issue, USCC has also suggested changes to the Commission’s plans regarding the sequencing and grouping of PEAs in the assignment phase. Neither proposal is justified by sound economic reasoning, and their adoption would act counter to the Commission’s objectives.

2 The Problem with the Commission’s Proposal

USCC’s proposal is designed to address what many parties agree is a serious threat to the success of the auction. The Commission has proposed to conduct a clock auction of “generic” licenses. But because many bidders value frequency contiguity—and, in fact, the “generic” licenses will often be highly heterogeneous—the Commission has also proposed to follow the clock auction with an assignment phase in which winning bidders would offer additional bids to acquire specific frequency blocks. The assignment phase would involve a sequential sealed-bid auction using a Vickrey pricing rule. The total price paid for each license (or

⁴Weber Note at 2.
group of licenses\textsuperscript{5}) would be the sum of the relevant clock phase price(s) and the Vickrey price determined in the assignment round.

As USCC and others have pointed out, collecting revenue from both phases of the auction will harm efficiency and depress clock phase revenues. Bidders in the clock phase will anticipate the need for further payments in the assignment phase. No bidder will pursue a strategy that it expects to result in its paying more (in total) for a license than it is worth. Therefore, unless a bidder is indifferent between all feasible assignment phase allocations associated with a given set of “wins” in the clock phase, its maximum willingness to pay in the clock phase will be pushed strictly below its valuation for the best (or even average) assignment.\textsuperscript{6} The result will be suppression of revenues and, since bidders with the maximum willingness to pay for the best licenses may not be those willing to pay the most for the worst licenses, inefficient allocations of the spectrum resource.\textsuperscript{7}

The allocative distortion and suppression of clock phase bids might be small in auctions where there is little inherent license heterogeneity. In such cases, bidders’ interests in the assignment phase (determined, e.g., by frequency contiguity rather than license impairment) may involve relatively little conflict. But in the 600 MHz auction, the Commission has proposed to allow substantial heterogeneity in impairments across nominally generic licenses. This heterogeneity would be especially severe in the case of “Category 2” licenses. Although the Commission has proposed an adjustment for license impairment, it is widely recognized that this adjustment is too crude to adequately reflect the loss in value implied by the impairments. The problem is further compounded by the Commission’s decision to assign licenses covering small geographic areas. Many bidders will seek footprints covering market areas considerably larger than a single PEA, and horizontal frequency contiguity offers significant efficiencies. Small license areas therefore create the likelihood of more conflicts among bidders’ interests in the assignment phase.

\textsuperscript{5}The Commission proposes to sometimes group PEAs for the assignment round, using criteria that have not yet been fully articulated, in order to promote efficient horizontal spectrum contiguity.

\textsuperscript{6}See, e.g., USCC Ex Parte at 7.

\textsuperscript{7}See Haile-Kearns-Dworkin at 7.
Thus, USCC is correct in pointing out that the Commission’s current combination of proposals is likely to result in clock phase revenues that fall well short of the value that the spectrum would bring to the wireless market. Because it is the clock phase bids that determine satisfaction or failure of the final stage rule, these defects threaten to cause failures of clearing targets that would have succeeded under alternative rules (or if “generic” licenses were in fact generic).

Professor Robert Weber, on behalf of USCC, has recently submitted further analysis that strongly reinforces these concerns. His simulations show that, under the Commission’s proposed assignment phase design, “losing’ bidders could pay nothing and end up with their least-preferred assignments, while ‘winning’ bidders could receive their preferred assignments but end up paying so much they would be no better off than had they been freely awarded their least-preferred assignments.”

Accordingly, “[t]he result of the [assignment] auction, when all bidders follow their value-revealing strategies, is shown to leave each bidder roughly as poorly off as if it had received its least-valuable of all feasible assignments.” Accordingly, “[t]he result of the [assignment] auction, when all bidders follow their value-revealing strategies, is shown to leave each bidder roughly as poorly off as if it had received its least-valuable of all feasible assignments.”

And because bidders will then treat the “value of winning generic licenses in the forward auction” as equivalent to “the value of receiving the worst feasible . . . . combination of licenses in the frequency-assignment auction . . . . , all bidders will rationally reduce their bids in the clock phase.”

In fact, “since there would typically be no single assignment pattern which is simultaneously worst for all of the bidders, the bidders would be given cause in the clock auction to bid more conservatively than would be justified in even the worst possible post-assignment world.”

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8USCC Ex Parte at 9.
9Weber Note at 3.
10Weber Note at 3.
11Weber Note at 3.
3 What Should an Assignment Phase Do?

The assignment phase is a “fix-up” to deal with the fact that nominally generic licenses may in fact have very different values to different bidders. The design of the assignment phase can therefore be very important: at the end of the clock phase, much of the potential social value of the spectrum remains to be realized through efficient allocation. Therefore, even among assignment mechanisms that collect no new revenue, the choice of assignment phase rules will affect bidders’ willingness to pay to reach the assignment phase. Thus, in the present context, a good assignment phase must promote efficient allocation while limiting the adverse effects on clock phase revenue that can result from a revenue-generating assignment phase auction.

A points-based assignment mechanism would avoid the direct effect of anticipated assignment phase payments on clock phase bids. But different points-based mechanisms will have very different efficiency properties. Efficiency is itself a primary objective of the auction. And an efficient assignment phase will promote aggressive clock phase bidding by maximizing the value that clock-phase bidders compete to share. As usual, a key challenge is the fact that the information about valuations needed to determine efficiency is spread among bidders. In simpler settings, an auction is the standard recommendation for drawing out this information: an auction provides competitors the opportunity and incentive to make bids that generally (or even exactly) reflect the trade-offs they are willing to make between the feasible outcomes. So when one firm offers $1.5 million for a license in a Vickrey auction and another offers only $1 million, one can reasonably infer that the first one expects to create more value from the tract (and, moreover, that the two bidders themselves even agree on this).

Two fundamental features justify this inference. One is that a bid is a binding offer of a valuable resource (money): if a bidder agrees to pay $1 million to attain one outcome rather than another, we can be sure that the bidder believes the first outcome will create at least $1 million more in value for him than the second outcome. The second fundamental feature is that offers accurately convey the magnitudes of differences in value, allowing comparisons
of alternative allocations within and across bidders. Perfect inferences about the social value of different allocations is not always possible, and optimizing always requires good auction design. But there is no fundamental “apples-to-oranges” problem in comparing bids of real money.

Without bidding in money, these key features can easily vanish. Thus, the central challenge is finding a way for the Commission to select assignments based on valid inferences about efficiency but without relying on monetary payments that draw revenue out of the clock phase.

4 Points-Based Assignment Phase?

In this section I first describe the points-based approaches to the assignment phase sketched by USCC (Section 4.1). These particular proposals have serious flaws, as I explain in Section 4.2. However, the analysis of these proposals offers some useful lessons about key features a good points-based assignment mechanism would need to incorporate—a topic I take up in Section 4.3.

4.1 USCC’s Proposals

The USCC filings contain sketches of two possible approaches for a points-based assignment phase.

4.1.1 Points-Based Bidding

One idea is to allocate each clock phase winner a budget of points that can be used in an assignment auction.\textsuperscript{12} For example, the same Vickrey auction rules might be used, but with bids on the admissible assignments made in points instead of dollars. USCC suggests giving each bidder “a supply of, say, 1000 bidding ‘points’” which it could allocate as bids for different assignments.

\textsuperscript{12}Weber Note at 5.
4.1.2 Assignment Scoring

A second suggestion is to let each clock phase winner “score” each of its feasible assignments on a scale of, say, 0 to 100. The assignment maximizing the sum of scores would then be selected by the Commission.

4.2 The Specific USCC Proposals are Flawed

While the concept of a points-based assignment mechanism is a promising idea worthy of further exploration, USCC’s specific proposals are significantly flawed.

4.2.1 Points-Based Auction

By giving the same budget of points (say, 1000) to each bidder, USCC’s design would give an undue advantage to clock phase winners with fewer feasible assignments. For example, if Bidder 1 had two feasible allocations and Bidder 2 had five, Bidder 1 could concentrate its 1000 points on its favored allocation, whereas Bidder 2 would have to spread its 1000-point budget across many combinations to express its preference ordering and protect itself against its least favored assignments. This creates a severe disadvantage for bidders with many feasible assignments and will prevent efficient allocations from being realized.

4.2.2 Assignment Scoring

There are also serious problems with the USCC proposal for assignment scoring. One is that bidders winning multiple licenses would be penalized in the assignment phase. To see this most simply, suppose that in a given assignment round there are four licenses: two “good” licenses and two “bad” licenses. The clock phase winners agree that a good license is worth 10 and a bad license worth 5. However, there are only three clock phase winners, with Bidder 1 having won two licenses. If Bidders 2 and 3 each assign scores of 100 to each of the good licenses and 0 to the bad licenses, they are guaranteed to win the good licenses. This is because Bidder 1 has only 100 points to assign to his favored two-license allocation,
while his competitors can each assign 100 points to each of the two good licenses. This is similar to the problem with the budget assignment discussed in the case of the auction. Here the disadvantage comes not from having to spread a budget over many assignments, but from the fact that Bidder 1 has fewer “votes” than each of his rivals do on whether a given assignment is selected by the Commission. As a result, comparing the total “votes” (points) for each assignment option fails to reveal which assignment creates the most value. Further, it does so in a way that will systematically suppress bidding by firms that would otherwise aggressively pursue 10×10 MHz coverage in one or more PEAs.

A second (but related) problem with assignment scoring is that it provides too little information about the intensity of bidder preferences. Again consider a simple example for the sake of illustration. Suppose there are two licenses available in a given assignment round with two clock phase winners. The bidders’ valuations for the two licenses are as in the following table.

<table>
<thead>
<tr>
<th>Bidder</th>
<th>License</th>
<th>“good”</th>
<th>“bad”</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>10</td>
<td>8</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>14</td>
<td>0</td>
</tr>
</tbody>
</table>

Here bidders have the same ordinal ranking of the two options, although very different preference intensities. With the proposed assignment scoring scheme, each bidder would choose to assign a score of 100 to the good license and 0 to the bad license. The allocation will then be random (each bidder with a 50% chance of receiving the good license) and therefore inefficient (the total value of the assignment is 22 if Bidder 2 gets the good license, but only 10 if Bidder 1 does). Moreover, this yields expected gross surplus (ignoring the clock phase bid) of 9 for Bidder 1 and 7 for Bidder 2. Anticipating this outcome in the assignment phase, the bidders’ maximum willingness to pay in the clock phase will be 9 for Bidder 1 and 7 for Bidder 2. The problem is that under a scoring system bidders have limited incentive (none in the example) to accurately convey the intensity of their preferences: there
is nothing providing the required link between the scores bidders offer for an assignment and the relative value created by that assignment. Comparisons of different bidders’ scores inherently involve “apples to oranges” comparisons.

4.3 Going Forward

While the details of the initial sketches from USCC are problematic and should not be implemented, I view their broader suggestion of a points-based assignment phase as a promising idea that should be explored further by the Commission and its auction experts. There will be no assignment phase design without some compromises among the Commission’s objectives. A poorly chosen points-based assignment mechanism could easily cause more harm than the Commission’s current proposal. But a carefully designed points-based system might offer an improvement over the Commission’s existing proposal.

The problems with the USCC proposals discussed above point in some directions for identifying better approaches. A good assignment mechanism will require that bidders award/bid points to assignment options in a way that conveys as accurately as possible the total value that would be created by each assignment. A system based on scoring of assignment options appears to provide insufficient incentives for bidders to convey accurate information about intensities of preferences or to allow even approximately meaningful comparisons across bidders. Such information is essential to promoting efficiency through the assignment phase.

On the other hand, we know from elementary economics that budget constraints provide incentives for decision makers to act in ways that reveal their preferences. Giving each clock phase winner a fixed budget of points would force them to allocate their points carefully—generally speaking, in a way that reflects the relative values of different options. Thus, a points-based assignment auction seems most promising.

One key question, however, is how budgets of points would be determined. To promote efficiency, budgets should be larger for bidders with more at stake in the assignment phase. This would allow those whose valuations are most affected by the assignment decision to convey this through their bids. Budgets that are unresponsive to bidders’ “value at stake”
will result in “apples-to-oranges” comparisons (as in a scoring-based assignment scheme), making it impossible to determine which assignment options promote efficiency. Of course, the Commission cannot know exactly how much value each bidder has at stake in the assignment phase. So a critical question is whether adequate proxies are available. One proxy for a bidder’s value at stake is the total value of its winning clock phase bids. For example, if the risk in a given round of the assignment phase is loss of a fixed percentage of a maximum attainable license value, a bidder’s value at stake in the assignment phase would be roughly proportional to the sum of its winning clock phase bids.

Two other features of a good points-based bidding system are also suggested by the examples discussed above. To see the first, recall the example in Section 4.2.1, where Bidder 1 had two feasible allocations and Bidder 2 had five. With identical budgets for the two bidders, Bidder 1 would bid its entire budget on its preferred assignment, whereas Bidder 2 would have to spread its budget across many combinations to express its preference ordering. This kind of problem does not arise when bidders are bidding with money, even when bidders have budget constraints. For example, if each bidder had a budget of $1000 instead of 1000 points, Bidder 2 could make bids summing to more than $1000 in the assignment phase, since ultimately only one allocation will be awarded. With bids in dollars, the budget constraint limits the total expenditure, not the sum of bids on all assignments. The same can be accomplished in a points-based bidding system by treating each bidder’s points budget as a cap on the bidder’s total payments (in terms of points) in the assignment auction rather than a cap on the sum of its bids (in points).  

To see the second feature, return now to the example given in Table 1. The two bidders would have made the same clock phase winning bids; so suppose each is given a budget of 1000 points for this round. Suppose further that points from one assignment round cannot

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13 Because bidders cannot know with certainty what payments they will end up making when bidding, this will require penalties for over-spending one’s budget or a system that verifies satisfaction of the budget constraints prior to accepting all assignment phase bids.

14 Implementing this principle alone (e.g., with equal budgets for all bidders and no cross-round fungibility of points) would be a step in the wrong direction, turning the assignment auction into the equivalent of USCC’s proposed assignment scoring mechanism.
be used in another round. Since each bidder has only two feasible assignments, each will bid all 1000 points for the good license. Just as under the scoring-based assignment mechanism, the allocation will be random, inefficient, and harmful to clock phase revenues. And again the problem is that bidders have little or no incentive to correctly convey the intensity of their preferences over feasible assignments. This problem would be significantly alleviated by allocating clock phase winners budgets of points that could be used freely in any assignment round: instead of a separate budget for each assignment phase round, each bidder should have a budget of points for the entire assignment phase. Under such a policy, Bidder 1 in the example would be reluctant to “burn” a large fraction of its aggregate budget in this round, since its preferences between assignments are mild. An efficient outcome would therefore be much more likely in this round. And Bidder 1’s resulting ability to bid more aggressively in another round, where its preferences are stronger, would likely result in greater efficiency in that round as well.

Summarizing these observations,

- An assignment scoring approach should not be adopted. However, options for a points-based assignment auction should be explored further.
- Points budgets in an assignment phase auction should be larger for bidders with more value at stake in the assignment phase.
- Budgets of points for an assignment phase auction should constrain bidders exactly as monetary budgets do: as caps on each bidder’s winning assignment bids.
- Bidders in an assignment phase auction should have budgets of points for the entire assignment phase, not separate budgets for each round.

## 5 Avoid Random Assignments

The Commission should not adopt USCC’s alternative proposal of random assignments. Random assignment, by construction, would lead to inefficient outcomes. There are substantial
efficiencies that can be realized only by permitting bidders to build horizontally contiguous blocks of spectrum. Random assignments would make such a result impossible, destroying much of the value available from the spectrum being auctioned. Thus, even in the absence of significant *ex ante* license heterogeneity, random assignments would ensure inefficient allocations of licenses among the clock phase winners, depressing bidders’ willingness to pay in the clock phase. The substantial heterogeneity between “generic” licenses makes random allocation an even worse idea, since allocating by “coin toss” would shut down all avenues for bidders to express the relative harm each would face as a result of the impairments, or to express their willingness to make trade-offs between impairments and frequency contiguity.

6 PEA Groupings and Sequencing

Under the Commission’s current proposal, the assignment rounds would begin with the largest markets and move to progressively smaller markets, with the Commission grouping PEA together when certain criteria are met. USCC advocates instead (a) holding a separate assignment round for each PEA (no grouping), and (b) sequencing those PEA in random order.

These modifications of the assignment phase would be counterproductive. Most important, they would make it all but impossible for bidders to attain efficient horizontal spectrum contiguity. A significant portion of the value of the spectrum in this auction is tied to the possibility of assembling such contiguous blocks, and both the sequencing and grouping strategies proposed by the Commission are limited efforts to offset the fact that the clock phase provides no way for the value of frequency contiguity to be realized. The changes proposed by USCC would frustrate such value creation, harming efficiency, reducing revenues, and threatening the success of the auction.

Against these harms, USCC offers arguments that do not withstand scrutiny. USCC seems to acknowledge that horizontal contiguity may create substantial value (especially for bidders with large footprints covering large markets). Its primary argument against
the Commission’s sequencing is that the extra value from contiguity would create an unfair advantage for large bidders relative to smaller bidders seeking isolated licenses: “by the time smaller bidders first participate in the assignment phase, the largest bidders will be willing to pay a premium for blocks that are geographically-contiguous to those they were assigned in the earlier rounds.” This reasoning is incorrect. Permitting bidders to express the value of horizontal contiguity does not create unfair advantages. In fact, the opposite is true: preventing bidders from expressing this source of value artificially advantages winners of isolated licenses. Contiguity adds to the value that can be created with the spectrum resource, and to neglect this value when determining assignments would harm efficiency and threaten the success of the auction. It is true that bidders with high valuations for particular licenses (whether due to contiguity or other reasons) are likely to win, but this is the desired outcome in a competitive auction, not a problem. In fact, winners of isolated licenses by definition do not need horizontal contiguity to obtain the full value of their licenses, whereas the winners that are seeking to build contiguous blocks of spectrum will lose a large portion of the value of their licenses if the assignment rules systematically prevent them from achieving that objective. Thus, I see no justification for abandoning the Commission’s proposed sequencing.

USCC’s argument in support of PEA-by-PEA assignment rounds is also unsound. They argue that with the Commission’s proposed grouping of PEAs, “a bidder could be forced to acquire an undesirable block in one PEA in order to acquire a desired block in another PEA.” There is no doubt that conflicts can arise—under any assignment phase rules—between bidders’ desire for unimpaired spectrum and their desire for frequency contiguity. But assigning blocks one PEA at a time only constrains bidders’ ability to respond to this tension. With bidding for license groups covering multiple PEAs, bidders can express their willingness to make trade-offs between the costs of impairments and the benefits of horizontal contiguity. PEA-by-PEA assignments would preclude this. A bidder would be forced to

\[\text{USCC Ex Parte at 14.}\]
\[\text{USCC Ex Parte at 16.}\]
choose the block it receives in one PEA without knowing what blocks it may be able to acquire in an adjacent PEA. Contrary to USCC’s claims, it is PEA-by-PEA assignments that come close to “forcing” a bidder to accept an undesirable block in one PEA in order to maintain horizontal contiguity. Thus, to the degree practical, the Commission should instead expand PEA groupings in the assignment phase in order to allow the realization of efficiencies from frequency contiguity and to reduce the risk and inefficiency that would be created by piecemeal determination of assignments.

7 Conclusion

Although none of the specific proposals of USCC should be adopted, I agree with their broad suggestion to consider the merits of a points-based assignment phase. Possible details of such a design should be given further study by the Commission.