



# PUBLIC NOTICE

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**DA 00-2404**  
**November 2, 2000**

## **AUCTION OF LICENSES IN THE 747-762 AND 777-792 MHz BANDS SCHEDULED FOR MARCH 6, 2001**

### **COMMENT SOUGHT ON MODIFYING THE CALCULATION FOR DETERMINING MINIMUM ACCEPTED BIDS AND CHANGING THE PROVISIONS CONCERNING “LAST AND BEST” BIDS**

#### **Report No. AUC-00-31-I (Auction No. 31)**

On July 3, 2000, the Wireless Telecommunications Bureau (“Bureau”) announced the procedures for implementing package bidding for Auction No. 31.<sup>1</sup> After further analysis and testing, we have determined that it may be appropriate to make further refinements: (i) to the calculation for determining minimum accepted bids; and (ii) to the provisions that allow a bidder that wishes to drop out of the auction to have an opportunity to make “last and best” bids on licenses and packages.

#### **I. Calculation for Determining Minimum Accepted Bid**

With regard to determining minimum accepted bids, we adopted the following three-part calculation: The minimum accepted bid for any license or package will be the greatest of: (i) the minimum opening bid; (ii) the bidder’s own previous high bid on that package plus x%, where the Bureau will specify the value of x in each round; or (iii) the number of bidding units for the license or package multiplied by the lowest \$/bidding unit on any provisionally winning package in the last five rounds.<sup>2</sup>

<sup>1</sup> See Auction of Licenses in the 747-762 and 777-792 MHz Bands Scheduled for September 6, 2000, Procedures Implementing Package Bidding for Auction No. 31; Bidder Seminar Scheduled for July 24, 2000, DA 00-1486, 15 FCC Rcd 11526, (rel. July 3, 2000) (*Auction No. 31 Package Bidding Procedures Public Notice*).

<sup>2</sup> *Id* at 11545.

We initially adopted part (iii) of the formula so that bids have a reasonable chance of becoming part of the provisionally winning set and because it was simple to implement for the then-scheduled auction date of September 6, 2000. Based on our initial experimental testing, we are concerned that part (iii) of the minimum accepted bid formula may not be sufficiently refined to discourage parking strategies, which could excessively delay the completion of the auction.

Several commenters — Rakesh Vohra and Robert Weber,<sup>3</sup> Aleksandar Pekec and Michael Rothkopf,<sup>4</sup> and Paul Milgrom<sup>5</sup> — in responding to the *Auction No. 31 Package Bidding Comment Public Notice*,<sup>6</sup> suggested an alternative approach to determining minimum accepted bid amounts, which they claimed would be more likely to ensure serious bids and help address the threshold problem. This approach would allocate among non-provisionally winning bids the total increase in revenue needed to tie the provisional winners. Milgrom defines the “shortfall” associated with a license or package as the difference between the revenue of the provisionally winning bid set and the maximum total revenue associated with the set of bids that includes that particular license or package.<sup>7</sup> He defines the “deficit” for the license or package as the shortfall multiplied by that package or license’s proportion of the [non-provisionally winning] bidding units.<sup>8</sup> In other words, the deficit is an allocation of the shortfall to the particular license or package in proportion to its share of bidding units relative to those associated with bids that were not part of the provisionally winning set, but are part of the set that maximizes revenue when including the particular license or package. Milgrom suggests that the minimum acceptable bid should be the greater of 50% of the deficit or the bidder’s own previous high bid on that package plus x%.<sup>9</sup> Alternatively, Pekec and Rothkopf propose allocating the shortfall in proportion to the bid amounts instead of the bidding units. Pekec and Rothkopf would permit bids at less than this amount but would only give activity credit for such a bid if it was the highest bid for that license or package.<sup>10</sup>

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<sup>3</sup> See A “Bids and Offer” Approach to Package Bidding, Rakesh Vohra and Robert J. Weber, pp. 7-10 (May 15, 2000).

<sup>4</sup> See Making the FCC’s First Combinatorial Auction Work Well, Comment on DA 00-1075, Comment Sought on Modifying the Simultaneous Multiple Round Auction Design to Allow Combinatorial (Package) Bidding” Report No. AUC-00-31-G (Auction No. 31), Aleksandar Pekec and Michael H. Rothkopf (June 7, 2000) (“Pekec and Rothkopf Comments”).

<sup>5</sup> See Comments Submitted by Paul Milgrom, Re: *Public Notice* DA 00-1075, (June 14, 2000) (“Milgrom Comments”).

<sup>6</sup> See Auction of Licenses in the 747-762 and 777-792 MHz Bands Scheduled for September 6, 2000; Comment Sought on Modifying The Simultaneous Multiple Round Auction Design to Allow Combinatorial (Package) Bidding, *Public Notice*, DA 00-1075, 15 FCC Rcd 8809, (rel. May 18, 2000) (“*Auction No. 31 Package Bidding Comment Public Notice*”).

<sup>7</sup> See Milgrom Comments at 4.

<sup>8</sup> *Id.*

<sup>9</sup> *Supra*, Milgrom Comments at 3.

<sup>10</sup> See Pekec and Rothkopf Comments at 4.

We propose to replace part (iii) of the minimum accepted bid formula with a percentage of the deficit as defined by Milgrom because it better approximates the amount of a bid that could become part of the provisionally winning set. We propose to set the percentage initially at 100 percent. We would retain the discretion to adjust the percentage of the deficit during the course of the auction to provide control over the pace of the auction. We believe that allocating the shortfall according to bidding units as opposed to bid amounts reduces the risk that bidders might attempt to bid up the prices of licenses or packages they do not wish to acquire in order to increase the share of the shortfall allocated to those licenses or packages. We seek comment on this proposal.

To account for the possibility that there can be more than one set of bids that yields the same shortfall for a given bid, we propose to choose the shortfall set that includes the most provisionally winning bidding units. Once such a shortfall set is determined, the deficit for the bid of interest is determined by multiplying the shortfall by the ratio of bidding units associated with the bid to the total non-provisionally winning bidding units in the set. This approach is likely to produce new bids with a realistic chance of becoming part of the provisionally winning set because it does not allocate any of the shortfall to provisional winners or to bids that were simple ties with provisionally winning bids but not chosen as provisional winners.<sup>11</sup>

To illustrate the proposed new method for calculating part (iii) of the minimum accepted bid formula, consider the following example: Suppose that in round  $x$  the provisionally winning set is a set of two packages: one nationwide package of the 10 MHz licenses and another nationwide package of the 20 MHz licenses. The revenue for this set is \$500,000,000. Suppose that the last time Bidder A bid on the Northeast 10 MHz license was in round  $y$  when he made a bid of \$30,000,000. To determine the minimum accepted bid amount in round  $x+1$  for Bidder A for the Northeast 10 MHz license, we begin by calculating the shortfall for that license. This is calculated by forcing Bidder A's \$30,000,000 bid from round  $y$  into the solution set for round  $x$ , allowing that bid to partner with all other bids by Bidder A in the considered bid set from round  $y$ , and making it mutually exclusive with all of Bidder A's bids not in round  $y$ .<sup>12</sup> Assume that the maximum revenue obtained by forcing this bid into the solution set is \$400,000,000. Therefore, the shortfall for this bid is \$100,000,000 (\$500,000,000 - \$400,000,000). Next, to address the possibility of multiple shortfall sets, we solve an optimization problem that maximizes the number of provisionally winning bidding units from round  $x$  in the shortfall set with the added constraints that the maximum revenue equals \$400,000,000 and that Bidder A's bid on the 10 MHz license must be in the solution. Suppose that the solution set for this optimization problem includes, in

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<sup>11</sup> A simple tie is a bid of the same amount on the same license or package. This approach does not eliminate the possibility that some of the shortfall may be allocated to complex ties that could have been in some provisionally winning bid set, just not the one chosen.

<sup>12</sup> The considered set includes (i) the bids made by each bidder in the most recent two rounds in which that bidder placed new or renewed bids and (ii) all provisionally winning bids from the prior round. For example, if  $y=x$  then all the bids in round  $x$  of Bidder A can partner with this bid because they would be in the considered set.

addition to Bidder A's 10 MHz Northeast license, the package of nationwide 20 MHz licenses that was in the provisionally winning set, and one or more other packages making up the remaining five 10 MHz licenses. Since provisionally winning bids have no shortfall, we would allocate the shortfall *only* among those bids in the shortfall set that are *not* in the provisionally winning set. The total bidding units from non-provisionally winning bids is  $6 * 14,000,000 = 84,000,000$  bidding units.<sup>13</sup> Since Bidder A's bid has 14,000,000 of the 84,000,000 bidding units,  $14,000,000 / 84,000,000$ , or  $1/6$ , the shortfall would be allocated to Bidder A's bid on the Northeast 10 MHz license. Thus, the minimum accepted bid increment for Bidder A's bid using this calculation would be  $\$100,000,000 / 6 = \$16,667,000$  (rounded to the nearest thousand), making part (iii) of the new minimum accepted bid for this license  $\$46,667,000$  for Bidder A ( $\$16,667,000 + \$30,000,000$  (Bidder A's previous bid)).<sup>14</sup> Part (i) of the minimum accepted bid formula would be the minimum opening bid for this license ( $\$14,000,000$ ), and part (ii) would be  $x\%$  more than this bidder's previous bid amount (assuming  $x = 10$ ,  $\$33,000,000$ ). Part (iii) yields the maximum value among the three alternatives; accordingly, Bidder A's minimum accepted bid for this license in the next round would be  $\$46,667,000$ .

We propose an exception to the modified minimum accepted bid formula for new packages. For operational considerations (running the optimization solver only between rounds), we propose that part (iii) of the formula for the initial minimum accepted bid for a new package created during the auction will continue to be calculated by multiplying the number of bidding units in the package by the lowest \$/bidding unit of any provisionally winning bid in the last five rounds. This exception will not apply to bids for the global package, however. In that case we will apply the three-part calculation as modified herein because the shortfall and deficit are so simple to calculate. Because a bid for the global package could never become a provisional winner unless it equals the maximum revenue from the previous round, we propose that the initial minimum accepted bid of a global package will be a percentage of the maximum revenue from the previous round. We seek comment on this proposal.

## II. "Last and Best" Bids

In the *Auction No. 31 Package Bidding Procedures Public Notice*, we adopted a procedure by which bidders that wish to drop out of the auction would have the opportunity before they drop out to make a "last and best" bid on any license or package for which they remain eligible.<sup>15</sup> We adopted this procedure in part to allow bidders to bid the maximum amount they are willing to pay for a package regardless of how the Commission sets the minimum accepted bid.<sup>16</sup> We propose to modify this procedure to allow bidders to pursue contingent bidding strategies. In mock auctions we conducted for software testing, there were bidders who wanted to provide a "last and best" bid on every license or package they wanted but did not have the opportunity to

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<sup>13</sup> Each 10 MHz license has 14 million bidding units.

<sup>14</sup> This assumes that we set part (iii) of the formula at 100% of the deficit, as proposed above.

<sup>15</sup> *Supra*, 15 FCC Rcd. at 11548.

<sup>16</sup> *Id.*

do so because some of their bids were mutually exclusive. Allowing two rounds of “last and best” bids would give bidders this flexibility. Specifically, we propose to allow bidders to make two sets of mutually exclusive last and best bids. In determining the provisionally winning bid(s), the round solver would consider these two sets of mutually exclusive bids, as well as any of the bidder’s bids that remain in the provisionally winning set. The bidder who chooses this option would not be permitted to make any further bids during the auction. We seek comment on this proposal to modify the “last and best” bid procedures.

Comments are due on or before November 15, 2000, and reply comments are due on or before November 22, 2000. Comments should refer to the DA number on this *Public Notice*, DA 00-2404. An original and four copies of all pleadings must be filed with the Commission’s Secretary, Magalie Roman Salas, Office of the Secretary, Federal Communications Commission, 445 Twelfth Street, S.W., TW-A325, Washington, DC 20054, in accordance with Section 1.51(c) of the Commission’s rules. *See* 47 C.F.R. § 1.51(c). In addition, one copy of each comment must be delivered to each of the following locations: (1) the Commission’s duplicating contractor, International Transcription Service, Inc. (ITS), 1231 20th Street, N.W., Washington, DC 20036; (2) Office of Media Relations, Public Reference Center, 445 Twelfth Street, S.W., CY-A257, Washington, DC 20554; (3) Rana Shuler, Auctions and Industry Analysis Division, Wireless Telecommunications Bureau, 445 Twelfth Street, S.W., 4-A628, Washington, DC 20554. Comments and reply comments will be available for public inspection during regular business hours in the FCC Public Reference Room, CY-A257, 445 12th Street, S.W., Washington, DC 20554.

This proceeding has been designated as a “permit-but-disclose” proceeding in accordance with the Commission’s *ex parte* rules. *See* 47 C.F.R. §§ 1.1200(a), 1.1206. Persons making oral *ex parte* presentations are reminded that memoranda summarizing the presentations must contain summaries of the substance of the presentations and not merely a listing of the subjects discussed. More than a one or two sentence description of the views and arguments presented is generally required. *See* 47 C.F.R. § 1.1206(b). Other rules pertaining to oral and written *ex parte* presentations in permit-but-disclose proceedings are set forth in Section 1.1206(b) of the Commission’s rules, 47 C.F.R. § 1.1206(b).

For further information concerning this proceeding, contact Walter D. Strack, Bureau Chief Economist, Wireless Telecommunications Bureau, (202) 418-0600; Evan Kwerel, Senior Economist, Office of Plans and Policy, (202) 418-2030; Howard Davenport, Auctions Attorney; Craig Bomberger, Auctions Analyst; or Karen Wrege, Auctions and Industry Analysis Division, Wireless Telecommunications Bureau, (202) 418-0660.