

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the matter of)	
)	
Auction of Broadband Radio Service Licenses)	AU Docket No. 09-56
)	
Comment on Competitive Bidding Procedures for Auction 86)	

**COMMENTS OF
THE PUBLIC INTEREST SPECTRUM COALITION**

On behalf of the Public Interest Spectrum Coalition,¹ Public Knowledge submits these comments in response to the Public Notice in the above docketed proceeding. We commend the Wireless Telecommunications Bureau (Bureau) for proposing to adopt anonymous bidding for Auction 86. As demonstrated by the use of anonymous bidding in Auction 73 (the “700 MHz Auction”), anonymous bidding eliminates the ability of bidders to engage in certain types of strategic behavior. This promotes increased competition for licenses and greater return to the public for use of the spectrum public asset.² A study conducted by Dr. Gregory Rose bearing out the benefits of anonymous bidding in Auction 73 is attached with these comments.

The Bureau Should Adopt Anonymous Bidding Rules for Auction 86

¹ PISC is an unincorporated *ad hoc* coalition of non-profit organizations with a membership consisting of the following, in alphabetical order: The CUWiN Foundation (CUWIN), Common Cause, Consumer Federation of America (CFA), Consumers Union (CU), EDUCAUSE, Free Press (FP), Media Access Project (MAP), the New America Foundation (NAF), the Open Source Wireless Coalition (OSWC), Public Knowledge (PK), and U.S. PIRG.

² See 47 U.S.C. §309(j)(3)(C).

In previous spectrum auctions, bidders have used open bidding to engage in signaling behavior aimed at reducing demand for licenses and keeping out new entrants³. Signaling has been described as collusive behavior where “bidders signal their willingness to abstain from competing over certain objects, provided they are not challenged on others.”⁴ A study by Prof. Peter Cramton and Prof. Jesse Schwartz found extensive use of such signaling in the PCS D, E, and F auction (auction 11)⁵. The study indicates that signaling resulted in a significant revenue loss.

Similarly, a study of the AWS -1 auction (Auction 66) by Dr. Gregory Rose⁶ found that incumbents used the open auction to keep new entrants from obtaining licenses. They achieved this result by a practice called retaliatory bidding i.e. concentrating collectively on newcomers who posed a competitive threat and using superior economic power to outbid them.

In response to these concerns, the Commission adopted anonymous bidding rules for Auction 73. As demonstrated by the attached study by Dr. Gregory Rose, an analysis of the results in Auction 73 bear out the prediction that anonymous bidding increased the overall efficiency of the auction by reducing the ability of bidders to engage in certain

³ See GREGORY ROSE, *How Incumbents Blocked New Entrants in the AWS-1 Auction: Lessons For the Future*, in SPECTRUM AUCTION BREAKDOWN: HOW INCUMBENTS MANIPULATE FCC AUCTION RULES TO BLOCK BROADBAND COMPETITION (June 2007), Working Paper 18, http://www.newamerica.net/files/WorkingPaper18_FCCAuctionRules_Rose_FINAL.pdf; GREGORY ROSE, TACIT COLLUSION IN THE AWS -1 AUCTION: THE SIGNALLING PROBLEM, in SPECTRUM AUCTION BREAKDOWN *Supra*; Peter Cramton and Jesse A. Schwartz, “Collusive Bidding in FCC Spectrum Auctions,” *Contributions to Economic Analysis and Policy* 1:1(2002) available at: <http://works.bepress.com/cramton/2>

⁴ Rose, *Tacit Collusion in the AWS-1 Auction*, *supra* note 3, at 6.

⁵ *Id.* (discussing the findings of Cramton and Schwartz’s study).

⁶ Rose, *How Incumbents Blocked New Entrants in the AWS-1 Auction*, *supra* note 3, p.15-18.

types of strategic behavior. In view of its proven benefits in Auction 73, PISC urges the Bureau to adopt anonymous bidding in auction 86.

Respectfully submitted,

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ATTACHMENT

**Increasing Competition and Encouraging New Entrants:
Recommendations for Rules for Auction 86 (BRS)**

Gregory Rose

Econometric Research and Analysis

April 29, 2009

Introduction

This study recommends that the anonymous bidding rules for Auction 73 (700 MHz Band) be retained for Auction 86. The algorithms used by previous scholarship to identify retaliatory and blocking bidding strategies which erected barriers to entry for new competitors in previous PCS and the AWS-1 auctions are validated by examination of bidding patterns in Auction 73, where anonymous bidding prevented the use of such strategies. The identification of no false positives in Auction 73 suggests that those algorithms correctly identified the scope and effects of those collusive strategies which anonymous bidding rules obviated in Auction 73. Furthermore, this study examines rates of head-to-head competition for licenses by major incumbents in Auction 66 and Auction 73 and finds significantly higher premiums associated with such competition on licenses in Auction 73 than Auction 66, which indicates that the anonymous bidding rules facilitated both greater head-to-head competition by major incumbents and resulting closer approximation of fair market price by eliminating bidders' collusive behaviors.

I. The Anonymous Bidding Rules for Auction 73 (700 MHz Band) Should Be Retained for Auction 86.

The anonymous bidding rules adopted by the FCC for Auction 73 effectively prevented bidders from adopting retaliatory bidding and blocking bidding strategies used in previous auctions by denying them the information necessary for targeting other bidding for those strategies. The elimination of these strategies resulted in a significant

premium for Auction 73 licenses over Auction 66 (AWS-1) licenses as a result of the increased competition for licenses.⁷

A. The Algorithms for Identifying Collusive Behaviors in Earlier Auctions by Cramton and Schwartz and Rose Were Validated by Auction 73.

To ensure that previous studies of the PCS auctions by Cramton and Schwartz⁸ and of AWS-1 by Rose⁹ had not overestimated the danger presented by these strategies to competition in FCC spectrum auctions the 36,419 bids in 261 rounds of Auction 73 were examined by the algorithms specified by Cramton and Schwartz for retaliatory bidding and Rose for blocking bidding. Since the anonymous bidding rules made use of these strategies literally impossible, identification of retaliatory or blocking bids by these algorithms in Auction 73 would amount to Type I error (false positives), calling into question whether the algorithms had correctly identified such strategies in earlier auctions. No potential retaliatory or blocking bids were identified in Auction 73 by these algorithms, confirming the methodology of Cramton and Schwartz and Rose.

⁷ As noted below, the concentration of licenses in the hands of incumbents (such as AT&T and Verizon) remained unchanged. This suggests that while anonymous bidding forced all bidders to pay higher prices, and attracted a greater number of challenges by new entrants, the incumbents still prevailed due to their superior resources and ability to extract greater value from the license by avoiding post-auction costs new entrants would incur. In addition, as noted below, the interaction of certain bidding rules adopted for Auction 73 and not at issue here, notably combinatorial bidding, had significant impact on the ability of incumbents to capture licenses.

⁸ Peter Cramton and Jesse A. Schwartz, “Collusive Bidding in the FCC Spectrum Auctions,” *Contributions to Economic Analysis and Policy* 1:1(2002).

⁹ Gregory Rose, “How Incumbents Manipulate FCC Auction Rules to Block Broadband Competition,” Working Paper # 18, New America Foundation, June 2007.

B. Anonymous Bidding Rules Resulted in Increased Major Incumbent Head-to-Head Competition and Resulted in Significantly Higher Premiums for Licenses in Auction 73.

The mean premium for Auction 73 spectrum over Auction 66 spectrum is 107.59% [$\exp(0.730)-1$], generally reflecting the superior technical characteristics of the 700 MHz Band spectrum. To estimate the premium arising from increased head-to-head competition between major incumbents, the following model of license price in Auction 73 was analyzed¹⁰:

$$\ln P_{i,b} = \beta_0 + \beta_1 \ln POP_{i,b} + \beta_2 \ln MHZ_{i,b} + \beta_3 REAG_{i,b} + \beta_4 BB73_{i,b} + \beta_5 INC2_{i,b} + e_{i,b}, \quad (1)$$

where $\ln P_{i,b}$ is the natural logarithm of the price of license i in block b , $\ln POP_{i,b}$ is the natural logarithm of the population of license i in block b , $REAG_{i,b}$ is a dummy variable for whether license i in block b was auctioned at the REAG level, $BB73_{i,b}$ is a dummy variable for whether license i in block b was in the B block which afforded the winner the opportunity to aggregate with previously auctioned 700 MHz spectrum, $INC2_{i,b}$ is a dummy variable for whether two or more major incumbents¹¹ bid on license i in block b , and e is the econometric disturbance term. Regressing these variables, I obtained the following coefficients:

¹⁰ Ordinary Least Squares regression was used in all regressions in this study.

¹¹ For purposes of this study a major incumbent is defined as a national carrier or a large regional carrier seeking national footprint. A national carrier is defined as a carrier with footprint over the contiguous 48 states obtained either by license or by preferential, discounted roaming agreements with other carriers. A large regional carrier is defined as a carrier with footprint over five or more states, the bidding strategy of which sought to acquire spectrum comparable to a national carrier.

$$\ln P_{i,b} = -7.663 + 1.291 \cdot \ln POP_{i,b} + 1.886 \cdot \ln MHZ_{i,b} - 1.404 \cdot REAG_{i,b} + \quad (2)$$

$$1.179 \cdot BB73_{i,b} + 0.995 \cdot INC2_{i,b} + e_{i,b}.$$

All variables were significant at $p < 0001$, the model was significant (F-statistic = 701.2085) at $p < 0001$ with an R^2 of 0.77. It is possible to estimate that the premium on licenses for which two or more major incumbents competed was 170.35% [$\exp(0.995)-1$] in Auction 73.

To test for the effects of even larger aggregations of major incumbent bidders on license price in Auction 73 the $INC2_{i,b}$ variable was replaced by the variable $INC3_{i,b}$, a dummy variable for whether or not three or more major incumbents bid on license i in block b :

$$\ln P_{i,b} = \beta_0 + \beta_1 \ln POP_{i,b} + \beta_2 \ln MHZ_{i,b} + \beta_3 REAG_{i,b} + \beta_4 BB73_{i,b} + \beta_5 INC3_{i,b} + \quad (3)$$

$$e_{i,b},$$

Regression of the variables resulted in the following coefficients:

$$\ln P_{i,b} = -7.523 + 1.330 \cdot \ln POP_{i,b} + 1.867 \cdot \ln MHZ_{i,b} - 1.449 \cdot REAG_{i,b} + \quad (4)$$

$$0.732 \cdot BB73_{i,b} + 1.065 \cdot INC3_{i,b} + e_{i,b},$$

All variables were significant at $p < 0001$ (except for $REAG$ which was significant at $p < .0002$), the model was significant (F-statistic = 593.785) at $p < 0001$ with an R^2 of 0.74.

It is possible to estimate that the premium on licenses for which three or more major incumbents competed was 190.08% [$\exp(1.065)-1$] in Auction 73.

To obtain a comparandum the following model of license price in Auction 66 was analyzed:

$$\ln P_{i,b} = \beta_0 + \beta_1 \ln POP_{i,b} + \beta_2 \ln MHZ_{i,b} + \beta_3 REAG_{i,b} + \beta_4 INC2_{i,b} + e_{i,b}, \quad (5)$$

where $\ln P_{i,b}$ is the natural logarithm of the price of license i in block b , $\ln POP_{i,b}$ is the natural logarithm of the population of license i in block b , $REAG_{i,b}$ is a dummy variable for whether license i in block b was auctioned at the REAG level, $INC2_{i,b}$ is a dummy variable for whether two or more major incumbents bid on license i in block b , and e is the econometric disturbance term. Regressing these variables, I obtained the following coefficients:

$$\ln P_{i,b} = -7.034 + 1.353 * \ln POP_{i,b} + 1.122 * \ln MHZ_{i,b} - 0.419 * REAG_{i,b} + 0.244 * INC2_{i,b} + e_{i,b}. \quad (6)$$

All variables were significant at $p < 0001$ except for $REAG$ (which was significant at $p < 0.0156$) and $INC2$ (which was significant at $p < 0.0006$), the model was significant (F-statistic = 1451.5627) at $p < 0001$ with an R^2 of 0.84. It is possible to estimate that the premium on licenses for which two or more major incumbents competed was 27.63% [$\exp(0.244)-1$] in Auction 66.

To test for the effects of even larger aggregations of major incumbent bidders on license price in Auction 66 the $INC2_{i,b}$ variable was replaced by the variable $INC3_{i,b}$, a dummy variable for whether or not three or more major incumbents bid on license i in block b :

$$\ln P_{i,b} = \beta_0 + \beta_1 \ln POP_{i,b} + \beta_2 \ln MHZ_{i,b} + \beta_3 REAG_{i,b} + \beta_4 INC3_{i,b} + e_{i,b}, \quad (7)$$

Regression of the variables resulted in the following coefficients:

$$\ln P_{i,b} = -7.568 + 1.396 * \ln POP_{i,b} + 1.139 * \ln MHZ_{i,b} - 0.655 * REAG_{i,b} + \quad (8)$$
$$0.295 * INC3_{i,b} + e_{i,b},$$

All variables were significant at $p < 0001$ (except for *REAG* which was significant at $p < .0003$, and *INC3* which was significant at $p < 0.0046$), the model was significant (F-statistic = 1445.752) at $p < 0001$ with an R^2 of 0.84. It is possible to estimate that the premium on licenses for which three or more major incumbents competed was 34.31% [$\exp(0.295)-1$] in Auction 66.

The mean number of major incumbent bidders per license in Auction 66 was 0.8034, in Auction 73 0.9423. These means differ significantly (t-statistic = -2.8967) at the $p < 0.0038$ level. It is clear that head-to-head competition between major incumbents was greater in Auction 73 than in Auction 66, and appropriate to attribute much of that competition to the inability of incumbents to identify other incumbents and avoid them. Furthermore, it is apparent from the premiums for licenses on which two or more major incumbents bid (170.35%) and three or more major incumbents bid (190.08%) in Auction 73, compared to the parallel premiums in Auction 66, 27.63% and 34.31%, respectively, that this increase in head-to-head competition for licenses between major incumbents resulted in significantly higher clearing prices in Auction 73. This is particularly striking given the fact that several major incumbents which participated in Auction 66 chose not to participate in Auction 73.

The increase in head-to-head competition and its consequences for license price in Auction 73 are indisputable, and much of both can be attributed to the anonymous bidding rules in Auction 73. However, as will be shown below, the anonymous bidding rules did not significantly attrit the rate at which major incumbents prevailed in obtaining licenses in Auction 73. Thus, while the anonymous bidding rules in Auction 73 considerably increased competition within the auction itself, as is indicated by the relevant premiums paid, they did not decrease the ultimate concentration of the majority of licenses in the hands of very few bidders. Despite this finding, the evidence for increased competition within the auction, and elimination of retaliatory and blocking strategies, is compelling and militates for adoption of the same anonymous bidding rules for Auction 86.

II. Factors That Contributed To Incumbent Dominance In Auction 73 Are Not An Issue for Auction 86.

The intersection of the FCC's combinatorial bidding, activity, eligibility, and minimum acceptable bid rules in Auction 73 created a disastrous reduction of auction revenue by nearly one half billion dollars, calling into question whether significant rules changes should be considered for AWS-III. In Auction 73 the FCC for the first time authorized combinatorial or package bidding only on the C Block.¹² Under the combinatorial bidding rules, three packages were offered: Package 50 States (consisting of REAGs 001-008), Package Atlantic (consisting of REAGs 010 and 012), and Package

¹² "Second Order and Report," FCC 07-132, August 10, 2007, 118 (http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-07-132A1.pdf); "Auction of 700 MHz Band Licenses Scheduled for January 24, 2008," DA 07-4171, October 5, 2007, 39-41 (http://hraunfoss.fcc.gov/edocs_public/attachmatch/DA-07-4171A1.pdf).

Pacific (consisting of REAGs 009 and 011). Bidders could bid either on individual REAGs or a package in any round; the provisionally winning bid would be calculated in accordance with the rule:

For licenses in the C Block subject to HPB, the FCC Auction System will determine which combination of individual and package bids yields the highest aggregate gross bid amount, taking into consideration each bidder's highest bid on each license or package submitted up to that point in the auction. These bids become the provisionally winning bids for the round.¹³

Thus, only if the total of the bids on all the individual REAGs in the package exceeded the bid on that package – in auction jargon, if the package were broken – could a bidder on an individual REAG in that package win that REAG. In other words, if a bidder wanted only one or two REAGs which were included in the Package 50 States, two conditions had to obtain: (1) the total amount of the bids on the eight REAGs in Package 50 States had to exceed the amount of the bid on the Package 50 States (i.e., the package had to be broken), and (2) the bidder had to have the high bid on that one or two REAGs.

The eligibility and activity rules in Auction 73 mattered, too. Initial eligibility in Auction 73, the maximum number of bidding units on which a bidder may be active, was determined by the sum of the bidding units required for each license selected on the bidder's FCC Form 175.¹⁴ The activity rules required that a bidder be active on 80% of

¹³ "Auction of 700 MHz Band Licenses Scheduled for January 24, 2008," DA 07-4171, October 5, 2007, 64.

¹⁴ The eligibility required to bid on an individual license or package of licenses was determined by a relatively complicated formula set forth in "Auction of 700 MHz Band Licenses Scheduled for January 24," 2008, DA 07-4171, October 5, 2007, 35:

- For licenses covering CMAs in the 50 states in which the licenses offered in Auction 66 were sold, \$0.05 per MHz per population (MHz-pop) for Metropolitan

that bidder's eligibility in every round (i.e., either bid on licenses or packages in that round or hold the provisionally winning bid (PWB) on licenses or packages the bidding units of which equaled 80% of the bidder's eligibility) or lose eligibility.¹⁵ The rules provided that:

A bidder's activity level in a round is the sum of the bidding units associated with any licenses covered by new and provisionally winning bids. The bidding units associated with a given license will be counted only once in a bidder's activity calculation for the round, even if the bidder places a bid on the license and a bid on a package containing the license.¹⁶

A bidder's eligibility in the next round of Stage One of the auction was set at 5/4ths (125%) of that bidder's eligibility (i.e., activity level) in the immediately preceding round:

During Stage One, reduced eligibility for the next round will be calculated by

Statistical Area (MSA) licenses and \$0.03/MHz-pop for Rural Service Area (RSA) licenses

- For licenses covering EAs in the 50 states in which the corresponding licenses in both EA blocks offered in Auction 66 were sold, the sum of \$0.05/MHz-pop for counties contained within an MSA and \$0.03/MHz-pop for counties contained within an RSA
- For licenses covering REAGs in the 50 states in which the corresponding licenses in all three REAG blocks offered in Auction 66 were sold, the sum of \$0.05/MHz-pop for counties contained within an MSA and \$0.03/MHz-pop for counties contained within an RSA
- For licenses covering geographic areas for which an Auction 66 license was unsold, \$0.01/MHz-pop
- For licenses covering the Gulf of Mexico, \$1,000 per MHz
- For all remaining licenses, \$0.01/MHz-pop.

¹⁵ *Ibid.*, 45.

¹⁶ *Ibid.*, 45-46.

multiplying the bidder's current round activity (the sum of bidding units of the bidder's provisionally winning bids and bids during the current round) by five-fourths (5/4).¹⁷

When paired with the auction's bidding eligibility and activity rules, combinatorial bidding had an unforeseen and almost certainly depressing effect on the prices at which the individual REAGs in Package 50 States eventually cleared.

In Round 17 a high bid of \$4,713,823,000 on Package 50 States exceeded the reserve price. That meant that the wireless *Carterfone* service rules would take effect. A number of bidders had bid on individual REAGs in the Package 50 States, but the sum of these bids did not exceed the total bid on Package 50 States. While the anonymous bidding rules precluded release of the identity of the high bidder on Package 50 States in any given round, the high bid amount for each license and package was announced at the end of each round, and speculation in the press correctly identified the Package 50 States bidder as Google Airwaves. The bid placed on Package 50 States in Round 17 remained the provisionally winning bid until Round 26, when QUALCOMM's bid on REAG 004 broke the package. Table 1 shows the dynamics leading to this outcome (the bids are in millions of dollars):

Table 1. Breaking the Package

REA	Round						
	18	19	22	23	24	25	26
001	Alltel/604.624	604.624	604.624	604.624	604.624	604.624	604.624
002	MretoPCS/306.1	ATT/637.18	637.183	637.183	637.183	637.183	637.183

¹⁷ *Ibid.*, 48.

	17	3					
003	KingStreet/933.36	933.360	933.360	933.360	933.360	933.360	933.360
004	ATT/602.118	602.118	QUALCOMM/578.334	578.334	884.144	1,158.757	1,405.293
005	Bluewater/174.128	174.128	174.128	QUALCOMM/485.989	485.989	485.989	485.989
006	Bluewater/683.894	683.894	683.894	683.894	683.894	683.894	683.894
007	Copper Valley/1.906	1.906	1.906	1.906	1.906	1.906	1.906
008	SAL/2.799	2.799	2.799	2.799	2.799	2.799	2.799
Total	3,308.946	3,640.012	3,616.228	3,928.089	4,233.899	4,508.512	4,755.048
Package 50 States	4,713.823	4,713.823	4,713.823	4,713.823	4,713.823	4,713.823	4,713.823

During the twenty-five rounds that the Google Package 50 States bid was provisionally winning, a number of bidders which had bid on individual REAGs earlier shifted strategies to bid on other licenses and no longer had sufficient eligibility to reinstate their non-PWB earlier bids on those REAGs as Table 2 shows:

Table 2. Eligibility of Bidders When the Package Was Broken

Bidder	Eligibility at End of Round 26 in Bidding Units	Eligibility Required to Reinstate Lapsed Bids After Round 26	Eligibility Required for Bids Actually Placed After Round 26
<i>Alltel Corporation</i>	<i>499,125.00</i>	<i>52,530,000.00</i>	-
AST Telecom, LLC	30,200.00	13,000.00	13,000.00
AT&T Mobility Spectrum, LLC	102,108,000.00	77,381,000.00	-
<i>Bluewater Wireless, L.P.</i>	<i>955,000.00</i>	<i>51,966,000.00</i>	-
Cellco Partnership d/b/a Verizon Wireless	306,371,250.00	-	281,116,000.00

<i>Cellular South Licenses, Inc.</i>	10,147,500.00	28,742,000.00	-
CHEVRON USA INC.	37,500.00	22,000.00	-
Choice Phone LLC	67,875.00	49,000.00	49,000.00
Club 42 CM Limited Partnership	345,000.00	62,000.00	62,000.00
<i>Copper Valley Wireless, Inc.</i>	195,000.00	528,000.00	-
Cox Wireless, Inc.	11,706,125.00	1,185,000.00	1,185,000.00
<i>Cricket Licensee 2007, LLC</i>	0.00	110,098,000.00	-
Google Airwaves Inc.	287,371,000.00	281,116,000.00	-
<i>King Street Wireless, L.P.</i>	26,078,750.00	86,310,000.00	-
Kurian, Thomas K.	1,000,000.00	924,000.00	924,000.00
<i>MetroPCS 700 MHz, LLC</i>	5,686,250.00	88,597,000.00	-
<i>NatTel, LLC</i>	0.00	22,000.00	-
<i>PTI Pacifica, Inc.</i>	34,125.00	49,000.00	-
<i>Pulse Mobile LLC</i>	33,750.00	49,000.00	-
QUALCOMM Incorporated	185,310,000.00	28,742,000.00	28,742,000.00
SAL Spectrum, LLC	3,260,750.00	1,713,000.00	528,000.00
<i>SeaBytes, L.L.C.</i>	15,000.00	22,000.00	-
Small Ventures USA, L.P.	27,500.00	-	-
Triad 700, LLC	11,240,000.00	-	1,390,000.00
<i>Vulcan Spectrum LLC</i>	6,768,750.00	51,966,000.00	-
Xanadoo 700 MHz DE, LLC	1,000,000.00	-	13,000.00

Lacked sufficient eligibility to bid on REAs after Round 26

In other words, 46.15% of bidders lacked sufficient eligibility to reinstate bids or place new bids on REAGs after the package was broken in Round 26. This accounts in large part for Verizon Wireless' ability to place unchallenged winning bids on seven of the

Package 50 States REAGs in Rounds 27-30.¹⁸ Uncertainty arising from the interaction of the combinatorial bidding, eligibility, activity, and anonymous bidding rules were a crucial determinant of who still had the eligibility to persevere after the package was broken.

Verizon's success in C Block was in many respects a "perfect storm" interaction of the combinatorial bidding, eligibility, and activity rules with the procedure used by the FCC to calculate minimum acceptable bids. On REAG 001 (Northeast) Verizon was able to win the license in Round 29 with a bid of \$502,774,000, which was \$101,850,000 less than Alltel's bid of \$604,624,000, but since Alltel's was not provisionally winning because the package had not been broken when it was made, the minimum acceptable bid for REAG 001 in Round 29 was only \$502,774,000 and Alltel no longer had sufficient eligibility to reinstate the lapsed bid. A similar situation occurred with REAG 006 (West), where Verizon won the license in Round 30 with a bid of \$319,798,000, which was \$364,096,000 less than Bluewater Wireless' bid of \$683,894,000 in Round 6, but the minimum acceptable bid for REA 006 in Round 30 was \$319,798,000 because Bluewater Wireless' bid was not provisionally winning since the package had not yet been broken; Bluewater Wireless did not have sufficient eligibility to reinstate the lapsed bid. In short, this "perfect storm" enabled Verizon to obtain the two most populous REAGs for nearly half a billion dollars less than earlier bidders were willing to pay, but those bidders lacked sufficient eligibility to challenge Verizon after the package broke in Round 26.

¹⁸ Verizon Wireless was challenged on REAG 007 by SAL Spectrum, LLC and Triad 700, LLC in Round 39; Triad 700, LLC prevailed in Round 40. Cox Wireless continued to bid on REAG 008 in Rounds 26-28, but did not challenge Verizon Wireless' winning bid in Round 30.

III. Application of The Lessons of Auction 73 to Auction 86.

It follows from this analysis of Auction 73 that while the Commission should continue the use of anonymous bidding. The continued success of incumbents¹⁹ in obtaining desired licenses resulted in part from the interaction of the Commission's experiment with combinatorial bidding and the eligibility rules. Because combinatorial bidding has not been proposed, this concern is substantially reduced. The Commission should therefore adopt anonymous bidding for Auction 86.

¹⁹ As defined in note 5, *supra*.