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July 9, 2007

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

In Re: Service Rules for the 698-746, 747-762
And 777-792 MHz Bands

WT Docket No. 06-150

Filed Electronically via ECFS

Dear Ms. Dortch:

On behalf of Alltel Communications, Inc. ("Alltel"), I transmit herewith for inclusion in the record of the above-referenced matter, the comments of Professors Jeremy Bulow, Jonathan Levin, Paul Milgrom of Stanford University, and Professor David Salant of Columbia University and Clemson University (jointly, the "Professors") regarding various matters related to the Commission's consideration of the rules governing the 700 MHz spectrum auction.

Specifically, Alltel argues and the Professors' comments suggest:

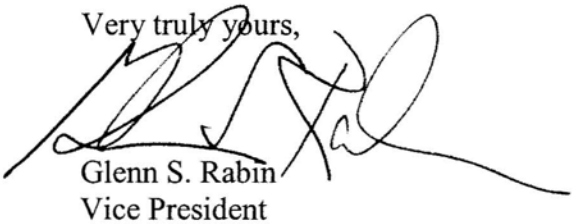
- Uniform and smaller spectrum blocks over smaller geographic areas produce the greatest opportunity for the broadest spectrum of potential bidders at auction. While an "exposure" problem may exist for large scale bidders, as a matter of magnitude and public policy, it is dwarfed by the potential threshold problem that larger license areas and package bidding impose upon other bidders.

- Package bidding has not been sufficiently tested, and if used, should only be available to *de novo*, large-scale market entrants who (at least in theory) are the subset of bidder who may actually experience an exposure problem. Package bidders should be required to pay a premium for their licenses in order to compensate for the effects of the threshold effect on other types of bidders.

- Blind bidding does not ensure a more competitive auction, and, in any case, should not be combined with package bidding as smaller and regional bidders may be severely limited in their ability to react to the auction market mechanism in real time. If blind bidding is utilized, periodic updates of eligibility and other matters should be provided to all bidders.

Please address any questions regarding this submission to undersigned counsel.

Very truly yours,



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

In the Matter of	)	
	)	
Service Rules for the 698-746, 747-762 and 777-792 MHz Bands	)	WT Docket No. 06-150
	)	
	)	
Former Nextel Communications, Inc. Upper 700 MHz Guard Band Licenses and Revisions to Part 27 of the Commission's Rules	)	WT Docket No. 06-169
	)	
	)	
Implementing a Nationwide, Broadband, Interoperable Public Safety Network in the 700 MHz Band	)	PS Docket No. 06-229
	)	
	)	
Development of Operational, Technical and Spectrum Requirements for Meeting Federal, State and Local Public Safety Communications Requirements Through the Year 2010	)	WT Docket No. 96-86
	)	

To: The Commission

COMMENTS OF JEREMY BULOW, JONATHAN LEVIN, PAUL MILGROM, STANFORD UNIVERSITY, AND DAVID SALANT, COLUMBIA UNIVERSITY AND CLEMSON UNIVERSITY

JULY 9, 2007

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I. INTRODUCTION AND SUMMARY OF CONCLUSIONS

The FCC must promote both innovation and further competition among existing carriers and new entrants in carrying out the 700 MHz auction. Decisions governing the geographic scope of license areas, the size and location of spectrum blocks, and the procedural rules of the auction are critical to furthering these goals in the fairest and most efficient manner. The auction rules should be designed with the intent of achieving an outcome that is as close to possible to a socially and economically efficient allocation of the spectrum. To this end, the rules should limit incentives for bidders to strategically withhold demand, to divide markets to reduce prices, and to engage in other potentially anti-competitive behavior. These comments address what we view as key issues in designing the 700 MHz auction. Specifically:

- **The geographic areas and spectrum blocks for all bands should be uniform, and preferably the areas should be Cellular Market Areas ("CMAs").** Smaller geographic areas create the most flexibility for all bidders and allow smaller bidders to compete with major incumbents. The recent AWS auction experience also shows that large-scale *de novo* entry is possible with smaller licenses. Moreover, there appears to be no need for larger bandwidth blocks, such as the 20 MHz blocks in the AWS auction. The auction will be more efficient if all the blocks are a uniform size between 10 and 12 MHz.
- The recent package bidding experiments by Goeree, Holt and Ledyard ("GHL")[1] provide very limited insight into how well package bidding might work in the 700

[1] Goeree, Jacob; Holt, Charles; & Ledyard, John. "An Experimental Comparison of Flexible and Tiered Package Bidding", prepared for the Wireless Telecommunications Bureau of the Federal Trade Commission under FCC Contract CON0500012, May 25, 2007.

MHz auction. Their experiment considers only a single specialized setting, and studies only the case where licenses are all complements rather than a mix of complements and substitutes. The latter limitation, although it sounds narrow and technical, is crucial in terms of the applicability of the experimental results to spectrum auctions, as we discuss below. **For this reason, the FCC should not use the GHL package bidding mechanism for the 700 MHz auction.**

- **If the FCC does decide to use package bidding we recommend it be limited to *de novo* entrants as only *de novo* entrants face an exposure problem**. **Package bidders should also be required to pay a premium so as to compensate for the effects of the threshold effect.**
- **Anonymous or blind bidding does not ensure a competitive auction and would have been unlikely to have improved the outcomes of most previous auctions.** Blind bidding can affect decisions to participate, as well as bidding behavior, in an auction. In Auction 71 blind bidding may have served as a disincentive for potential bidders to go to auction, which attracted only one of the top 10 wireless operators. Should the FCC deem it necessary to limit information provided to bidders between rounds, it should do so judiciously, so as to preserve the efficiency advantages of the SMR auction design. Totally anonymous bidding, as proposed prior to Auction 66, risks reducing the efficiency obtained from the auction.
- **Should the Commission adopt blind bidding, then it should provide periodic updates about individual bidder eligibility as a way to mitigate the costs of limiting disclosure during the auction.**

- In order to maintain the economic benefits of uniformity, **no spectrum should be burdened with particular or asymmetric public interest obligations, such as for open access or public safety.** All obligations of licensees should be clearly and completely specified before the auction, so that potential bidders have ample opportunity to assess valuation and business plan implications.

II. GEOGRAPHIC SIZE OF LICENSE AREAS AND SPECTRUM BLOCK BANDWIDTH

In defining license areas and spectrum block sizes, there is a well-understood trade-off between smaller licenses that allow all bidders substantial flexibility, and larger licenses than may benefit some bidders who want to purchase large blocks of spectrum.

Small license areas and blocks with smaller bandwidth have several advantages. Small licenses areas, such as CMAs, facilitate entry by small or regional firms and permit existing carriers to fill gaps in their coverage footprints or solidify their coverage in selected areas. Small license areas also give major incumbent carriers the opportunity to pick up significant blocks of spectrum, should they so desire. For example, in the recent AWS auction, T-Mobile purchased a large number of CMA licenses. Similarly, blocks with smaller bandwidth allow a bidder seeking a limited expansion in bandwidth to obtain only what is needed. Smaller bandwidth also facilitates entry of more operators in any given geographic area.

The main argument made in favor of large licenses is that in a simultaneous ascending auction with small licenses areas, a bidder who wants to cover a large geographic area might encounter an "exposure" problem. This refers to a situation where a bidder is worried that if it ends up with only a subset of its desired licenses, it will have

little value for the purchased licenses. To the extent that this situation arises, it is important to understand that it primarily affects large-scale *de novo* entrants. It is unlikely that a firm that is expanding a large existing footprint will find itself facing an exposure problem.

Even for a bidder that is attempting to enter on a nationwide scale, careful bidding strategy has the potential to mitigate exposure problems. For example, in the AWS auction, SpectrumCo was a *de novo* entrant that assembled near-nationwide coverage by putting together of collection of relatively small licenses. Moreover, SpectrumCo achieved this outcome without special rules limiting competition and without the benefit of any subsidies.

Peter Cramton has argued that large license areas are needed in the 700 MHz auction, as a firm seeking nationwide coverage would otherwise find it difficult to solve the exposure problem.[2] He stated that the premium paid for REAGs in the AWS auction illustrates the premium that bidders would need to pay in the 700 MHz auction to avoid the exposure risk.

Cramton's argument is difficult to reconcile with two observations. One is that the purchasers of the REAG licenses in the AWS auction were primarily major incumbent firms building on existing footprints.

The second observation is that the existence of REAG licenses neither facilitated entry nor provided benefit to *de novo* entrants in the AWS auction. Indeed, the one

[2] *See* Cramton, Peter. "Why Large Licenses are Best for the 700 MHz Spectrum Auction", filed April 17, 2007 on behalf of Verizon Wireless, WT Docket No. 06-150, at 9-10.

nationwide *de novo* entrant, SpectrumCo, acquired its nationwide footprint without purchasing a single REAG license in the continental US.[3]

SMR auctions have the advantage that the markets for the most expensive licenses tend to clear first. This would seem perhaps even more likely when licenses are sold on a CMA basis, so that there are several licenses in each market. Thus we can expect the major cities to clear prior to the smaller markets. This is a significant benefit to any firm, such as a new entrant, trying to put together an aggregation. Knowing what price you will have to pay for the most expensive markets significantly reduces the exposure problem.

When one packs the trunk of the car, it makes sense to put the big suitcases in first. So too, with spectrum auctions --- it makes more sense to see what New York, Los Angeles, and Chicago will cost before making commitments to smaller markets. By having uniform and relatively small geographic markets, the big cities (as opposed to the big geographic areas) are more likely to clear first, and this is arguably an advantage for potential entrants.

An explanation consistent with the fact that the nationwide incumbents do not face an exposure problem is that the large and sophisticated bidders who purchased the REAG licenses, Verizon and Cingular, decided when they made their bids that it would be at least equally costly to achieve their auction objectives by buying the smaller licenses. While *ex post* the smaller licenses proved to be cheaper, it is also possible that if one of those two buyers had adopted a strategy similar to that of SpectrumCo, then the prices on the small licenses could have been as high as or higher than on the prices of the large licenses.

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[3] SpectrumCo did purchase a Hawaii REAG license. However, in Hawaii, an REAG license and a EA license are effective substitutes, as both cover the entire state.

The primary drawback to large license areas, such as REAG licenses, is that they disadvantage smaller bidders. This can result in an inefficient allocation of spectrum. If two or more small bidders, in aggregate, have a higher value for a given coverage area than a larger bidder, the large bidder may still win if the entire area is covered by a single large license. In this situation, a large license area operates inefficiently to the advantage of the large bidder. For companies seeking to enter on a small scale or seeking to expand partial footprints, large license areas can be a significant barrier to entry.

If the Commission designates some blocks as large licenses, such as REAGs, and others as small licenses, such as CMAs, there is a possibility that the simultaneous ascending auction effectively will be converted into a sequential auction. The AWS auction is a case in point. In that auction, serious bidding on the BEA and CMA licenses only commenced after bidding had more or less ended on the REAG licenses. One explanation for this is that bidders perceived it to be difficult to switch from the smaller licenses to the REAG licenses given the activity rules, so bidding started with the REAGs before switching to the BEAs and CMAs.

A concern with this kind of sequential bidding is that it can result in similar objects selling for very different prices. This was the case in the AWS auction where the BEA and CMA bands sold at a steep discount to the REAG bands. It is also a well-documented phenomenon in sequential auctions for art, wine and other goods.[4]

[4] Beggs, Alan & Graddy, Kathryn. "Declining Values and the Afternoon Effect: Evidence from Art Auctions", *The RAND Journal of Economics*, Vol. 28, No. 3, Autumn, 1997, at 544-565. *See also* Ashenfelter, Orley. "How Auctions Work for Wine and Art", *The Journal of Economic Perspectives*, Vol. 3, No. 3, Summer, 1989, at 23-36; and Ashenfelter, Orley & Graddy, Kathryn. "Auctions and the Price of Art", *Journal of Economic Literature*, Vol. 41, No. 3, September 2003, at 763-787.

We urge the FCC to adopt geographic license sizes and an auction design for the 700 MHz auction that encourages allocative efficiency while still permitting large-scale *de novo* entry. Based on the observations above, a natural way to achieve this goal is to divide each band into smaller spectrum blocks and geographic areas.

This logic suggests that all the spectrum blocks should be divided into CMAs. With regard to block size, spectrum block bandwidth should not be larger than 10 or 12 MHz. This would permit operators to purchase the amount of spectrum they need. Because the 3G technologies (and prospective 4G technologies) that are expected to be used on these bands require approximately 10 MHz, smaller bandwidths are not advisable.

III. PACKAGE BIDDING

Proposals to incorporate package bidding into the simultaneous ascending auction are intended to capture the desirable efficiency of small license areas while facilitating large scale *de novo* entry through the use of package bids. We believe that with a carefully thought-out and well-tested design, package bidding could be a useful element of future auctions. But there are a great many potential pitfalls with package bidding, a few of which we want to emphasize here.

One of the primary concerns with package bidding is that it can tilt the competitive playing field in favor of package bidders by creating what are known as "threshold" problems that foreclose small bidders and lower revenue. A threshold problem arises if two or more smaller bidders have on aggregate the highest value for a given collection of licenses, but are unable to respond in a way to prevent a lower-valued

package bid from beating them. Because of the need for coordination, it seems likely that blind bidding, discussed below, would exacerbate threshold problems created by package bidding or excessively large geographic license areas.

Recently GHL have reported experimental success with a tiered package design.[5] Unfortunately, their experimental design fails to capture an important characteristic of spectrum auctions because it assumes that all bidders view licenses as complements. In spectrum auctions, it is often the case that bidders view some sets of licenses as substitutes or need to respect budget constraints. But under the GHL design a bidder who wants to purchase either license x or license y but not both, or who wants to keep his total spending under a certain limit, faces a serious problem because bids from prior rounds can become winning bids.[6] If the bidder bids on x, is outbid by a package bid and switches to y, he may end up with both x and y later in the auction. On the other hand, if prior round bids cannot become winners and minimum bids are rising, then the auction can't work well with complements.

It is quite likely that for some bidders in the 700 MHz auction, licenses in geographically neighboring areas will be complements, while licenses for different bands in a given geographic area will be substitutes. For an experiment to provide useful

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5 Goeree, Holt, & Ledyard, 2007.

6 As a matter of theory, simultaneous ascending package auctions that, with straightforward bidding, converge monotonically to Walrasian package prices are easy to design when all bidders' valuations are superadditive, as appears to be true for the GHL experiments. So, the pure complements assumed by GHL are a very special case. For example, suppose both Bidders A and B are seeking a package that includes license x. Suppose, further that early in the auction A has a provisional winning bid on that package. And, then suppose B bids on, and is a provisional winning bidder, on other licenses. Then, suppose A subsequently loses its package to another bidder, C, and that C is bidding on a package that does not include license x but does include other licenses in A's package. In this case, B might want to go back to pick up x but would not be able to do so in the GHL type of auction.

insight for the 700 MHz auction, it would need to include substitutes and complements simultaneously.

The activity rules in the GHL experiment also may permit a great deal of opportunity for "point parking". A bidder seeking to relax the impact of activity requirements can engage in tactical bidding on individual licenses or on packages that are likely to be topped, in a manner that cannot be readily captured in the GHL experimental scenarios. The possibility of such point-parking suggests that the GHL conclusions about auction duration cannot be relied upon in a more complex environment than was tested.

If the Commission does decide to use a form of package bidding in the 700 MHz auction, we recommend that it restrict package bids in two important ways in order to mitigate the threshold problem and keep the playing field level. First, only *de novo* entrants should be permitted to make package bids, thereby limiting the "solution" to the specific exposure problem experienced by ambitious new entrants.[7] Second, package bidders should be required to pay a premium, say 10-20% of their package bids in order to compensate for any discount in valuation they obtain as a consequence of threshold problems encountered by individual license bidders. In terms of the specific package design, one possibility would be the Milgrom-Wrege 51% rule for package bidding, properly tested and configured, which would also make it unnecessary to have tiered packages.[8]

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[7] This type of limitation could be easily enforced by the adoption of strict ownership attribution rules (i.e. a maximum of 5%) for incumbent licensees and principals with significant interests.

[8] *See* Comments of Paul Milgrom and Karen Wrege, filed September 20, 2006, WT Docket No. 06-150, at 3-9.

IV. LIMITED AUCTION DISCLOSURE OR "ANONYMOUS" OR "BLIND" BIDDING

Given the high quality and propagation characteristics of the 700 MHz spectrum, and because it is the last large swath of spectrum to be auctioned in the foreseeable future, there is likely to be sizeable participation in the auction. With a high level of demand, the potential gain from limiting the information disclosed during the auction is predicted to be minimal.

Limiting the disclosure of information during the auction is intended to make it more difficult for bidders to coordinate collusive bidding strategies. However, the Commission has previously recognized that efficiency can be impaired by limiting the information available to bidders. For Auction 66, the Commission decided to establish a threshold level of initial eligibility, with the proviso that the auction would be conducted with full disclosure if the initial eligibility exceeded that threshold value. In other words, the Commission judged that if auctions are "sufficiently" competitive, then limiting disclosure may have greater costs than benefits.

Here we make three comments about this approach. First, if used in conjunction with package bidding, limited disclosure (anonymous) bidding can be problematic. Bidders who lack full information will be unable to evaluate when increasing their own offers can potentially help make up the shortfall of individual bids relative to a package bid. Absent such information, a group of bidders each of whom seeks an individual or small subset of licenses is less able to solve the threshold problem in competition with a large bidder. In such a situation, disclosing information can potentially enhance efficiency and increase revenue.

Second, while the FCC's current approach to triggering anonymous bidding, which hinges on the initial eligibility ratio, appears to be a sensible middle ground between a fully open and a totally blind auction, the approach requires some adjustment. For example, in the event of anonymous bidding, a policy of providing bidders with feedback about the amount of each individual bid, and measures of aggregate eligibility, attempts to strike a balance between promoting competition and allowing bidders to be informed. However, because bidders – particularly small and regional bidders – may be interested in complementing licenses won by other bidders who use the same technology it is critical that a bidder learn in which regions each of the other bidders using that technology has provisionally winning bids (although not necessarily specific licenses). This can be accomplished in a number of ways, well short of full disclosure. One is by posting, at regular intervals (every *n* rounds), the identity of the provisional winning bidders by region but not by license.[9]

Should the Commission consider limited anonymous bidding, it must contemplate not only the benefits, but also the potential costs that would result from reductions in information aggregation, auction efficiency and participation. Most important are the potential pro-competitive benefits to firms attempting to build networks that complement the licenses likely to be won by bidders whose networks use compatible technologies. Also, if the auction does include package bidding, then full disclosure provides bidders seeking a large package greater opportunity to avoid the exposure problem.

[9] If there is only one block of spectrum licenses for a particular geographic partition (as was the case with CMAs in Auction 66), then this would amount to posting the high bidders on that license every *n* rounds, rather than the identity of the one high bidder after each round..

Third, limiting disclosure of information appears to benefit only a few licenses even in the most competitive auctions. Providing periodic updates about individual bidder eligibility is a way for the Commission to mitigate the costs of limiting disclosure during the auction.

The FCC has conducted a few auctions with anonymous bidding. Auction 71 included the limited disclosure rules that the Commission is considering for the 700 MHz auction.[10] Because Auction 71 was a small auction that experience may be of limited value in providing guidance for the 700 MHz auction. However, the experience and results from Auction 71 suggests that anonymous bidding could have had a deterrent effect (i.e. larger bidders do not participate) and may produce inefficient results. Auction 71 attracted few participants and only one of the ten largest wireless operators. Further, while licenses of equal bandwidth and geographic scope should generally command equal valuation in a given auction, in Auction 71 this did not always happen. Moreover, anonymous bidding procedures also deprive auction participants of information critical to assessing market valuations.

V. POST-AUCTION REQUIREMENTS – OPEN ACCESS AND PUBLIC SAFETY OBLIGATIONS

Frontline has suggested that a Block E licensee be required to provide two services not required of other license holders—open access to its spectrum by other

[10] The first FCC auction, Auction 1, was also partially "anonymous". As the Commission is aware, during that auction bidders were able to back out some information about rival bids. That experience was perhaps a factor in the Commission deciding to reveal bidder identities in subsequent auctions.

carriers, including access to purchase wholesale services and roaming, and provision of certain public safety services.[11]

One argument in favor of imposing an open-access requirement on the license holder of one band is to address potentially limited competition in some regional wholesale roaming markets. If the FCC is concerned that wholesale roaming rates that the nationwide carriers impose on small and regional carriers are anti-competitive, then the Commission should address this issue in the WT 05-265 proceeding. It should not require potentially impractical and ineffective remedies of the license holder of one spectrum block, which may be difficult to enforce *ex post*, thereby distorting the value of this spectrum and interfering with its efficient use.

Further, public safety needs can be best served with a secondary procurement auction or other type of process that is open to all CMRS licensees. The most cost effective solution may involve having different operators providing public safety services in different regions, and possibly multiple operators providing service in any single region.[12] However, to the extent that the Commission wishes to impose specific new obligations on one or more blocks for this auction, we would support the Skrzypacz and Wilson view that these obligations should be clearly and completely specified before the auction so that bidders have ample opportunity to assess valuations and business plan implications.[13]

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[11] Comments of Frontline Wireless, LLC, filed February 26, 2007, WT Docket No. 96-86. *See also* Initial Comments of Frontline Wireless, LLC, filed May 23, 2007, WT Docket No. 06-150.

[12] P. R. Milgrom, "Procuring Universal Service: Putting Auction Theory to Work", in *Le Prix Nobel: The Nobel Prizes*, 1996, Nobel Foundation, 1997, 382-392.

[13] *See* Skrzypacz, Andrzej & Wilson , Robert. "The Design of the 700 MHz Spectrum Auction: An Opportunity to Promote Competition and Public Safety", filed May 23, 2007 on behalf of Frontline Wireless, WT Docket No. 06-150, at Exhibit 1.

VI. CONCLUSION

Licensing of the 700 MHz bands will be significant for the US economy, because of the high quality and propagation characteristics of this spectrum and because it is the last large swath of spectrum to be auctioned in the foreseeable future. The 700 MHz auction should attract wide interest. In order for American consumers to obtain the substantial benefits, it is essential that the auction procedures promote participation, engender competition and provide a level playing field. Several decisions are crucial to achieving these goals.

First, the Commission should divide both the Upper and Lower 700 bands into as uniform blocks as possible, 10 – 12 MHz each, and with coverage areas defined by CMAs. The Commission has indicated a preference for a variety of different size areas, CMAs, EAs and REAGs, so as to accommodate the business plans of different operators.[14] However, past experience shows that this is unnecessary.

Second, the FCC should not adopt the GHL package bidding design for this auction. Too little time remains to refine and test package bidding rules to risk introducing this major complexity into such a high stakes auction.

Third, the Commission should favor an open auction environment in which provisionally-winning bidders' identities are disclosed after each round, especially given the likely interest in the auction.

Fourth, the Commission should set uniform requirements for all licensees, and refrain from imposing an open access requirement on the winner of any block. To the

[14] *See* Federal Communications Commission, "Report and Order and Further Notice of Proposed Rulemaking", released April 27, 2007, WT Docket No. 06-150, at 19-20.

extent that specific requirements are imposed on the winner of any block they need to be clearly and completely specified in advance of the auction.