

Speculation Mounts as FCC's 700MHz Auction Application Deadline Nears

Alan J. Weissberger

aweissberger@sbcglobal.net

Abstract: We have earlier written about the potential and power resulting from the FCC's upcoming 700 MHz spectrum auction (<http://www.viodi.tv/2007/04/10/wimax/>). The recent rhetoric and speculation have heated up to a boiling point, such that we are compelled to provide an updated analysis, the auction details and selected analyst's opinions.

The FCC auction of this "beachfront property" spectrum is scheduled to begin January 24, 2008, but applications have to be received by December 3, 2007. Wire payments are due December 28, 2007 – almost one month before the actual auction.

This auction could have a profound effect on the landscape of the mobile telecommunications market by opening the door to one or more new mobile operator(s). There is a lot of talk that Google will bid for this spectrum- either with a partner or alone. The gossip has reached a fever pitch with excerpts included in this article.

Background:

The 700MHz band is part of the UHF band (470 – 862MHz), which is being opened in several regions across the globe - including Europe in 2010 and in Korea in 2012- as television moves from analog to digital. Regulators are leaning towards spectrum neutrality, which would let the market determine the ideal use of the spectrum, and are also looking to harmonize use of the spectrum. This band is suitable for 3.5G -4G technologies, such as WiMAX, and mobile broadcast TV technologies such as DVB-H.

700 MHz has superior propagation characteristics compared to AWS, PCS and cellular frequencies. In particular, the signals have: longer reach, which is especially important in areas with low population densities. Fewer sites are needed to provide a 700MHz service, which lowers upfront capital expenditures as well as recurring expenses. This can make serving remote areas cost-effective. However, it is not as important in urban areas, where capacity is the primary concern.

Equally important is the better penetration of the (lower frequency) 700 MHz signals:

- Goes through trees, buildings and other obstacles better than higher frequencies
- This is important in BOTH rural and urban areas
- More forgiving in terms of Line of Sight, regardless of application
- Extensive in-building coverage is important, particularly for landline replacement

The **FCC press release** for the auction provides a broad overview and good starting point for understanding. It also includes a spectrum chart, shown in the Figure 1., below.

The FCC press release may be accessed at:

http://www.fcc.gov/073107/700mhz_news_release_073107.pdf

Also see: http://wireless.fcc.gov/auctions/default.htm?job=auction_summary&id=73

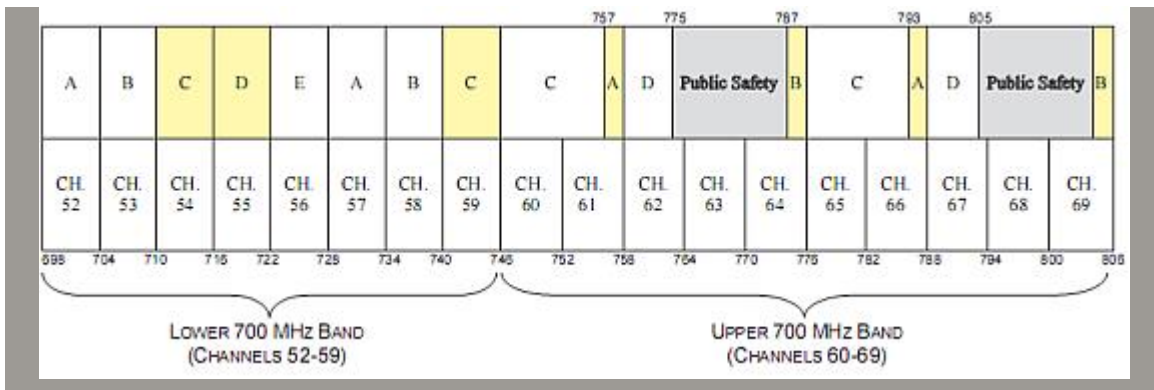


Figure 1, 700 MHz Spectrum Map

The 700 MHz spectrum is actually from 698-806 MHz. In the figure, the yellow sections have already been auctioned off, and the gray sections are reserved for the nationwide public safety broadband network that will be constructed over the next few years. The remaining (white) A,B,C,D, and E blocks are what will be offered at the auction. The C and D blocks are highly coveted. C covers two 11MHz chunks of spectrum that can be bid on together, making 22MHz available for national commercial use.

The licensees of the upper 700 MHz Band **C Block of spectrum** (see Figure) will be required to provide a platform that is more **open to devices and applications**. This would allow consumers to use the handset of their choice and download and use the applications of their choice in this spectrum block, subject to certain reasonable network management conditions that allow the licensee to protect the network from harm.

The **10 MHz upper D Block** must be shared with public safety in a public/private partnership. Public Safety characteristics were further described in an August 10th FCC report (see below).

To keep up with the latest FCC rulings on this and other auctions please visit:

http://wireless.fcc.gov/auctions/default.htm?job=auctions_home

700MHz Spectrum Usage:

Speaking at ISPCON this October, George Harris, Sr. Vice President at Denver, Colo.-based investment bank Falkenberg Capital Corporation stated that there are two

applications today for 700MHz: **Broadcast mobile TV and Fixed Wireless Broadband**. He notes that Qualcomm/ MediaFLO has licensed the lower D-Block nationwide (6 MHz, unpaired) and that the high power limits make broadcast viable. There are a variety of vendors and technologies for 700 MHz fixed broadband access with probably about 15+ network operators. Currently, operators have a choice of equipment from four vendors, he said: Airspan (using PPMA: pre-emptive polling multiple access), Arris (using DOCSIS), WaveIP (using OFDM/WiMAX), and Soma (using WiMAX). Harris said that Soma gear will have the most expensive base station but the cheapest CPE.

Harris speculates that future uses and applications for 700 MHz will be based on mobile, **cellular-type services**. He is not aware of any deployments today, but evidence points towards mobility, because Public Safety will be receiving spectrum in the band and they need mobility. Likely auction participants include; Verizon, ALLTEL and other mobile voice and data service providers. It is likely that **CDMA**-based equipment will be available prior to GSM. AT&T acquired Aloha Partners' 700 MHz spectrum portfolio and may offer tri-band phones – at 700, 850, 1900 MHz.

Other panelists at ISPCON thought satellite operators Direct TV and Echo Star would bid for the 700 MHz spectrum and offer fixed broadband Internet access. Astonishingly, no one suggested that a WiMAX operator would bid for that spectrum.

Auction Rules and Regulations:

The following is a capsule summary of the FCC notices leading up to the auction. [Much of this information was provided by Stephen Coran, a partner at the Washington, D.C.-based law firm Rini Coran, who presented at this October's ISPCON]:

On **April 25, 2007**, the FCC released a **Notice of Proposed Rule Making** regarding the upcoming 700 MHz spectrum auction (**Auction 73/76**). The 700 MHz band is extremely valuable because signals in 700 MHz travel about four times farther than those on bands used by the wireless and electronics industry today. With the 700 MHz being the “holy grail” of wireless spectrum, stiff competition combined with FCC projections have set a minimum average reserve price for a B-Block license at \$4.81 / pop (e.g., a license area covering a geography of 100,000 people would require a minimum bid of \$481,000).

The January 24, 2007 auction is called **Auction 73**. If any spectrum fails to raise enough money, it will be offered in a section auction at a later date, and that auction will be called **Auction 76**. Although Auction 76 has not been scheduled, it appears to be open only to bidders who participate in Auction 73. Of course, if the first auction fails to meet the reserve price, the section auction should be open to new bidders.

Here are a few key bullet points:

- The FCC auction is predicted to generate **\$10-20 billion**.

- Spectrum includes 698-806 MHz bands, which currently are occupied by TV channels 52-69. Note that three bands have already been auctioned: C block 710-716 MHz and 740-746 MHz; and D Block 716-722 MHz.
- Broadcasters required by Congress to vacate that spectrum by February 17, 2009
- 10 year license term; 8 years if used for broadcast services
- Intense lobbying, highly politicized

On **August 10, 2007**, the FCC released a 352-page **Second Report and Order**. This included:

- Public safety element description
- Novel and unique rules for commercial bands
- Build-out requirements
- “Open Platform” guidelines
- Block-specific reserve prices
- Anonymous bidding process

Note: In order to prevent collusion on the bidding, the FCC will inform each bidder for a specific license of the other bidders for that license. Bidders will be forbidden from communicating with one another thereafter.

On **October 5, 2007** – FCC released a 122-page **Public Notice announcing auction procedures**. Highlights:

- Auction scheduled to begin January 24, 2008
- Auction seminar November 19, 2007
- Short-form applications due December 3, 2007
 - Applications to cover both Auction 73 and Auction 76
 - Anti-collusion compliance period begins
- Upfront wire payments due December 28, 2007
- Mock auction January 18, 2008

On **November 2, 2007** the FCC issued a **Public Notice for Auction 73**. It covers the following topics: Auction of 700 MHz Band Licenses; Revised Procedure for Auctions 73 and 76; Additional Default Payment for D Block Set at Ten Percent of Winning Bid Amount; Disputed Issues in the Negotiation of Network Sharing Agreement.

Build-Out Requirements:

While the auction rules state that the 700m MHz spectrum is to be vacated by broadcasters on February 17, 2009, the broadcasters may not vacate the spectrum on the expected date. Hence, it is possible that the spectrum will not be available when

scheduled. Therefore, the rules about building out service do not have fixed dates; they are based on fixed amounts time from the date (still somewhat uncertain) at which the spectrum becomes available to the auction winners.

The rules differ depending on the geographic area that the license covers. There are three sizes of geographic areas. The smallest is called **Cellular Market Area (CMA)**, the mid-sized grouping is called **Economic Area (EA)**, and the largest is the **Regional Economic Area Grouping (REAG)**. There are 12 REAGs, about 175 EAs, and about 734 CMAs (the number of licenses gives you an indication of the size of each area, and the maps show you the size of the area).

Maps of each area group (CMA, EA, REAG) are available at the Auction 73 page on the FCC website. The build-out requirements for the three area groups are also specified there.

http://wireless.fcc.gov/auctions/default.htm?job=auction_summary&id=73

What Others are Saying: Potential Bidders include Google and other New Players:

A recent **WSJ** article¹ suggests Google will be one of the bidders, either with one or more partners, or alone. The Journal article states, "Google is working out a plan to finance its bid, which could run \$4.6 billion or higher, that would rely on its own cash and possibly some borrowed money." The article speculates that "Google is focused mainly on bidding on what has been designated as the 'C' block, a slice of the 700 megahertz spectrum. It is also considering other blocks of spectrum available as well, though they would provide only regional coverage or come with other limitations. Google has hired game-theory specialists to help plot its auction strategy, say people familiar with the matter."

Sean Maloney, an executive vice president at chipmaker **Intel Corp.**, argues that the frequencies on auction could hasten the spread of high-speed Internet access to rural areas and others who can't easily get it. "Seven-hundred megahertz is a national treasure," he says. The government is expected to turn over use of the spectrum to the winning bidders by early 2009.

Though it has made no firm public commitment about the coming auction, Chief Executive Eric Schmidt has said Google probably would bid. Last month, he told journalists the company was considering joining with partners on a bid, but that it "won't make that decision until the very last minute as more information comes along."

¹ **Google Has Even Bigger Plans for Mobile Phones**, KEVIN J. DELANEY and AMOL SHARMA, November 16, 2007.

http://online.wsj.com/article_print/SB119517445580795065.html

Experience with the technology could aid the company in operating a full-fledged carrier, one of the options it's considering. Google is betting it could potentially build and operate a wireless network faster and cheaper than traditional operators operate.

In that event, the company could try new wireless technology approaches. Google this year invested in a closely held United Kingdom company called Ubiquisys Ltd. that makes a technology called femtocell, which allows mobile phones in poor-coverage areas to use home Internet connections to make calls and transfer data. Such technology could potentially be harnessed as part of any Google wireless infrastructure.

ABI Research Senior Analyst Nadine Manjaro opines, "Google has content and money, and could do a lot with that spectrum. They'd be a strong force to be reckoned with in terms of taking subscribers from the incumbents. If Google becomes an operator, it will intensify the incumbents' need to compete." The WSJ article states that Manjaro believes it is more likely that Google would form a partnership with an existing wireless network operator than try to build one on its own. "They have no experience in running a network, and it's not something simple to do," she says. Ms. Manjaro estimates the cost of building a national network on the spectrum available at \$3 billion or more.

Network World columnist Joanie Wexler has weighed in on the potential bidders for this spectrum.² She quotes analyst Andy Siebold who states that it will be used for **IP-only** services. That assertion conflicts with George Harris' comments above about **Spectrum Usage**. *We think that if cellular carriers like AT&T or Verizon submit winning bids, GSM and CDMA will be the protocols used.*

In another **Network World** column³, Ms. Wexler quotes Quentin Hardy, Silicon Valley bureau chief at Forbes.com. "Most exciting is the prospect of new business models," he said at a recent panel session organized by the Wireless Communications Alliance.

We certainly agree with that comment and expect entirely new applications and devices to be provided by the winning bidders.

The **New York Times** points out that there has been a global consensus reached on the

² **Curious cast of characters to vie for spectrum-Analysts speculate on 700MHz auctions.**
By Joanie Wexler, Network World, 11/14/07

<http://www.networkworld.com/newsletters/wireless/2007/1112wireless2.html>

³ **Shake 'em up, Google -700MHz auction plot thickens with Android, OHA announcements.** By Joanie Wexler, Network World, 11/12/07

<http://www.networkworld.com/newsletters/wireless/2007/1112wireless1.html>

use of 700MHz spectrum for wireless broadband services.⁴ The recent **World Radio Communications** (WRC) Conference stated that countries could use the 700-megahertz spectrum for wireless broadband services like cell phones, mobile TV and WiMAX, although at each country's time of choosing. "Most people in the industry believe this will be very important going forward in terms of supplying new services and new technologies to consumers around the world," said Richard Russell, who led the 150-member United States delegation, which included government and industry representatives.

"Because of this conference, countries around the world have the flexibility now to open up spectrum to wireless broadband at the time of their choosing," said Mr. Russell, the United States delegation leader. More broadly, he said, the WRC helps create a solid market for wireless broadband technologies and services. "There's much more certainty today than there was before the conference started," Mr. Russell said.

This author has not been silent on suggestions for the 700 MHz bidders. In a recent **WiMAX360** post⁵, Weissberger agrees with San Jose Mercury columnist and blogger Vindu Goel that **Google** should bid for the spectrum and operate or outsource a wireless broadband network. But, he also suggests that Google team up with a network equipment manufacturer (Cisco/Navini) and a service provider (Frontier Wireless or Clearwire) to build and operate the network. We know that Google has gotten a lot of valuable experience operating the city of Mountain View network, but we think that a wireless service provider would be better suited to operating and managing the resulting broadband wireless network, which might offer both fixed and mobile access.

Bryan Gardiner, writing in the **Wired Blog Network**⁶ proclaims: "Google will go it alone in 700 MHz Auction." Gardner refers to the previously referenced Wall Street Journal article to justify his assertion. He notes that the "C" block has the mandatory "open access" stipulations attached to it that Google and other companies (like Frontline Wireless) have fiercely lobbied the FCC for over the past few months. The FCC

⁴ **After Global Agreement, Companies May Bid Higher at Wireless Auction in U.S.** NY Times, 11/19/07. By VICTORIA SHANNON
http://www.nytimes.com/2007/11/19/technology/19wireless.html?_r=1&ref=business&oref=slogin

⁵ **Why Google Should Team Up With A WiMAX Equipment Vendor (Cisco?) and Bid for the 700MHz Spectrum.** By Alan J Weissberger , 11/12/07
<http://www.wimax360.com/profiles/blog/show?id=610217%3ABlogPost%3A37820>

⁶ **Google to Go it Alone in 700 MHz Auction**, By Bryan Gardiner November 16, 2007
<http://blog.wired.com/business/2007/11/google-to-go-it.html>

eventually agreed to Google's demands for the block, and the winning bidder will not be allowed to impose any limitations on either the mobile devices or the applications used to access the network. As many have pointed out, however, there is still a glaring escape clause attached to the auction Order which states that if the minimum \$4.6 billion bid is not met, the "C" block will be auctioned off without the open access rules attached.

In conclusion, Gardiner states, "The 700-MHz-spectrum auction, now set for January 24, 2008, has the potential to affect everything from the cost of wireless service to the competitive landscape among U.S. mobile providers for years to come. And while Google's precise bidding strategy won't be revealed until Dec. 3rd, it is clear the company seems more and more serious about rearranging the existing wireless landscape. To that end, Google is also reportedly testing its own advanced wireless network in Mountain View. Who knows, some of that "operating experience" may come in pretty handy if things go Google's way."

In their June 15th edition, **Wireless Week**⁷ states: "The spectrum is desirable for wireless carriers because at 700 MHz, fewer base stations are required than at higher ranges, making it more economical for build-outs." In addition to wireless carriers, "Everyone from Cyren Call Communications to Frontline Wireless and Google are giving advice on how to use the spectrum."

The magazine reports that **Alcatel-Lucent** has talked to several potential network operators. "Alcatel-Lucent has talked to a number of spectrum holders or potential holders that are looking to gain access to the 700 MHz spectrum. Those players represent a broad range of companies, says Sandip Mukerjee, vice president of strategy, marketing and communications for Alcatel-Lucent's wireless activities. Thus far, a common theme among those interested parties is convergence. "It's not just the radio," he says, adding that the solutions include radios and more in Alcatel-Lucent's portfolio."

Conclusions and Closing Comments:

We believe that the winning bidders with a sustainable business model and one or more partners will do quite well. *The problem continues to be that mobile network operators (and everyone else) are quite unsure about which business models work.* For example, will mobile advertising support Location Based Services (LBSs)? If a la carte (per service) pricing is charged, will the take rates be sufficient to generate profits for the carrier? What mix of services should be offered and is service bundling a viable option?

The choice of access technology will be especially important for WiMAX vendors. If the spectrum winners only deploy CDMA, GSM, and/or proprietary broadband wireless access methods, then the future success of WiMAX in the U.S. is very much in doubt.

⁷ **The 700 MHz Gorilla**, By Monica Allevan, WirelessWeek - June 15, 2007
<http://www.wirelessweek.com/article.aspx?id=149334>

Even then, roaming agreements between carriers will be needed along with multi-frequency devices.

Lastly, we hope that Google will submit a winning bid for the C block and (with the associated open access rules) force wireless carriers to open their networks to multiple applications and devices. U.S. wireless carriers have strictly controlled their networks and permitted devices/ applications. Google's open source Android platform would permit users to connect to any network and chose from a variety of third party applications. It seems like an excellent choice for software and wireless device vendors. So, we hope whoever does win the C block will build out the resulting network using the Android platform.