I250 Mini-Project Report
Sunny Lee
sunshine@ischool.berkeley.edu
March 10, 2010

# The Tussle between Wireless Companies and Broadcast TV over spectrum allocation

## Introduction

Last October, the FCC announced that they were considering taking back some airwaves from television broadcasters and auctioning them off to wireless companies in order to increase the availability of wireless broadband services [1]. FCC Chairman, Julius Genachowski warned that the US is facing a "looming spectrum crisis" [2] that could threaten the future of mobile communication in America. Over the past decade, consumer demand for high-speed wireless data services has exploded and has shown little sign of slowing down. In order to service this growing demand, mobile network operators have been clamoring for more spectrum to be allocated by the FCC. The problem is that spectrum is a limited resource.

Television broadcasters responded by showing skepticism of the existence of a spectrum crisis [3]. John Hane, counsel in the communications practice group of Pillsbury Winthrop Shaw Pittman, which represent the TV broadcast industry, stated that a full inventory of current spectrum allocation will prove that the current allocation of spectrum is sufficient to handle future growth. Furthermore, television broadcasters warned that TV brings "vast efficiencies to our national communications infrastructure [4]. In light of the tsunami warnings issued in Hawaii in the aftermath of the Chilean earthquake, the broadcasting industry was quick to point out the importance of television and radio stations in delivering public safety instructions in the event of a natural disaster [5].

In December of 2009, wireless and TV broadcasting industries had the chance to face off for the first time at a congressional subcommittee meeting on Capitol Hill in order to determine the potential reclamation of broadcast spectrum for broadband use [3]. According to an estimate released by the Brattle Group, the total value of broadcast spectrum would be worth about $62 billion [4]. Late February 2010, in a presentation before the New America Foundation, Genechowski proposed a voluntary auction of spectrum in which participating television broadcasters share in the proceeds [11]. It remains to be seen whether broadcasters will in fact line up to voluntarily give up spectrum.

## Brief Background

Radio frequency spectrum is used to organize and map the physical phenomena of electromagnetic waves. The term radio spectrum, interchangeably used with broadcast spectrum, refers to the full frequency range from 3kHz to 300GHz that may be used for wireless communication. The radio frequency spectrum, much like water, land and gas, is a national resource. The purpose of spectrum management is to mitigate radio spectrum pollution and

maximize the benefit of usable radio spectrum. In the US, the regulator (FCC) determines the use cases for specified spectrum portions as well as the parties who will have access to them [6].

While the general radio frequency band (i.e. wavelength, frequency) controls propagation characteristics, the detailed particulars of who uses what is arbitrary and historical [8]. Starting in 1912, spectrum allocation has been guided by government mandates -- in essence, by "command-and-control" government regulation [17]. Due to this legacy system, unlike carriers, broadcasters have never had to pay for their spectrum [12]. However they have occupied the spectrum for a long time and have something akin to a property right in their allocations [14]. Any effort to get the spectrum released for broadband use would require a significant legislative fight.

**The Tussle**

In the US, it became apparent that more of the broadcast spectrum was needed for wireless broadband Internet access. According to Cisco, the web will continue its rapid rate of growth to hit 56 exabytes of data per month by 2013. (cf. In 2008, IP traffic accounted for 9 exabytes per month.) [17]. The CTIA, the Wireless Association [9] filed a report to the FCC underlining this urgent need for expanded spectrum for mobile wireless broadband services and identified that the broadcast spectrum in the 470 - 698 MHz band, belonging to broadcast TV, was ideally suited for the provision of mobile broadband services. Moreover, CTIA argued that licensed spectrum was essential in promoting innovation and competitive wireless offerings. They questioned the claim made by National Association of Broadcasters (NAB) and the Association for Maximum Service Television (AMST) that broadcast TV use of the spectrum appropriately served the public interest since they are commercial entities that require a return on investment to their shareholders. The filing also took issue with broadcaster's argument that they make efficient use of allocated bandwidth [10]. Legacy systems mandated that each broadcaster be allocated 6 MHz of spectrum for each TV channel. With incorporation of digital technology, a compressed digital version of a standard TV signal could be transmitted in only 1 MHz [18].

In addition, a study commissioned by Consumer Electronics Association (CEA), found that large amounts of radio spectrum allocated to broadcast television could be reallocated, in whole or in part, to wireless broadband uses because the majority of consumers don't watch television broadcast via over-the-air digital licenses anyway. They watch it on cable [4].

Meanwhile, broadcasters argued that that 10 percent of the population who don't have a pay TV subscription would be forced to buy a previously free service. Broadcasters pointed to recent events in which due to the digital transition, television had lost 100 of its 400 MHz already when FCC auctioned off to Verizon and others, the spectrum in the 700 to 800 MHz range, which was reserved for television stations broadcasting analog signals. Broadcast associations retorted that the FCC's plan to reallocate broadcast TV spectrum for broadband use will disenfranchise consumers who have just spent billions of dollars for new digital TV

products, while making them permanently dependent on pay television services [4].

David Donovan of the AMST additionally pointed out that the 2GHz band, allocated for mobile satellite service, was not even being used after ten years, and switching to this band would be better than asking broadcasters to give up even more than they already have[15]. Moreover, broadcasters highlight that its value is not strictly measured in financial terms. There are public policy objectives such as universal service, local journalism, and public safety.

**Recommendation**

What the wireless industries, the broadcasters and government seem to agree on is a need for spectrum inventory in order to determine efficient use of spectrum. Wireless industries want to prove through this investigation that broadcasters' spectrum use is not as efficient as they claim it to be and broadcasters want to prove that the "looming spectrum crisis" is in fact quite overblown. A spectrum inventory will allow all parties to look at spectrum allocation in general including the more than 1500 MHz currently reserved by the US federal government for its discretionary use and the underused spectrum allocated for mobile satellite service. A cost analysis of an inventory endeavor should be conducted.

References:
1. Schatz, A. FCC Considers Shifting Some TV Airwaves to Broadband. http://online.wsj.com/article/SB10001424052748703574604574499730302393274.html
2. Gardner, D. FCC Chair Cites 'Spectrum Crisis' http://www.informationweek.com/news/government/mobile/showArticle.jhtml?articleID=220301552
3. Reardon, M. Wireless and broadcast industries begin spectrum debate. http://news.cnet.com/8301-30686_3-10416093-266.html
4. Lasar, M. Broadcasters fighting back against wireless spectrum reform. http://arstechnica.com/tech-policy/news/2009/11/broadcasters-fighting-back-against-wireless-spectrum-reform.ars
5. Hart. K. Tsunami warnings show value of TV airwaves, broadcasters say. http://thehill.com/blogs/hillicon-valley/technology/84063-tsunami-warnings-show-value-of-tv-airwaves-broadcasters-say
6. Spectrum Management http://en.wikipedia.org/wiki/Spectrum_management
7. http://kerry.senate.gov/cfm/record.cfm?id=310100
8. Frequency Allocation http://en.wikipedia.org/wiki/Frequency_allocation
9. CTIA http://en.wikipedia.org/wiki/CTIA_%E2%80%93_The_Wireless_Association
10. Guttman-McCabe, C. CTIA FCC Filing. Reply Comments of CTIA - The Wireless Association On Public Notice #6, Spectrum for Broadband, Nov 13, 2009.
11. Genachowski targets TV spectrum for broadband. http://www.rbr.com/tv-cable/21622.html
12. Higginbotham. S. Decision Time: Does the Nation Need TV or Mobile Broadband? Oct 28, 2009. http://gigaom.com/2009/10/28/decision-time-does-the-nation-need-tv-or-mobile-broadband/
13. Higginbotham, S. Cisco Says the Future of the Web is Video. Jun. 9, 1009.

http://gigaom.com/2009/06/09/cisco-sees-a-rosy-future-for-broadband/
14. Thierer, A. Cash-For-TV-Spectrum Scheme vs. A Property Rights Solution. Oc. 21, 2009. http://techliberation.com/2009/10/21/cash-for-tv-spectrum-scheme-vs-a-property-rights-solution/
15. Wireless Broadband http://en.wikipedia.org/wiki/Wireless_broadband
16. Donovan questions FCC focus on TV spectrum. Feb 25, 2010. http://www.rbr.com/tv-cable/21688.html
17. Lenard, T. White, L., Riso, J. Increasing Spectrum for Broadband: What Are the Options? Feb 2010. Technology Policy Institute.
18. Noll, M. Broadcasters still hold their 6 MHz spectrum sacred. Feb. 24, 2009. http://www.telecomengine.com/NewsGlobe/Commentary/article.asp?HH_ID=AR_4896