Remarks of Commissioner Meredith Attwell Baker

Maintaining a Spotlight on TV White Spaces Progress

TV White Spaces Summit
June 15, 2010

Good Morning. I would like to thank each of you who is working so hard to support the effort to use TV spectrum white spaces. Let's make it a reality. It is a great pleasure to be with you this morning, especially to be talking to you about one of my favorite topics: innovative wireless technologies that enable new approaches to spectrum.

We Have Made Progress on Freeing Up Spectrum for Wireless Broadband.

Some of you may know that FCC Chairman Genachowski and I have been working closely on spectrum issues since I joined the Commission. I am pleased with our collaboration. It's developed into a great relationship. The spectrum chapter of the National Broadband Plan is a useful outline for what the Commission, along with Congress and the Administration, need to accomplish as we strive to upgrade our 20th century spectrum policy to meet 21st century requirements. Last month, I was glad to join my colleagues in resolving the outstanding issues required to make the 2.3 Gigahertz Wireless Communications Services (WCS) spectrum available for mobile broadband use while protecting satellite radio services and aeronautical telemetry in neighboring bands.[1] The WCS item was particularly complicated and presented us with a number of hard questions with respect to both policy and technology.[2] Through an open and collaborative process and years of hard work from Julie Knapp and his team, we were able to develop a balanced way forward in a band that has faced regulatory uncertainty for too many years.[3] Similarly, the issues raised by the FCC's longstanding consideration of rules for accessing TV white spaces are no less challenging. But I think TV white spaces could afford even greater promise to open doors to further innovation. I hope we will able to come together on these issues as well—sooner rather than later.

Why We Need to Move the White Spaces Proceeding Forward.

To me it is important for us to move forward on the White Spaces proceeding for several reasons. First, work on this predates our 2004 proceeding.[4] That is simply too long to make you wait. Second, our

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1 *Amendment of Part 27 of the Commission's Rules to Govern the Operation of Wireless Communications Services in the 2.3 GHz Band; Establishment of Rules and Policies for the Digital Audio Radio Satellite Service in the 2310-2360 MHz Frequency Band*, WT Docket No. 07-293, IB Docket No. 95-91, GEN Docket No. 90-357, Report and Order and Second Report and Order, FCC 10-82 (2010)(*WCS Order*).

2 *See e.g. id.*, at 7 (discussing the analysis of worst-case scenarios involving the protection of satellite radio receivers in cars); *Id.*, at 14 (discussing out-of-band emissions limits to allow WCS and SDARS to co-exist); *Id.*, at 19 (discussing heavy debate regarding WCS and SDARS parameters to use for modeling interference); *Id.*, at 23 (discussing differing assessments of likelihood of interference).

3 *See e.g. id.*, at 30 (discussing compromises regarding the power limits of WCS devices); *Id.*, at 33 (discussing compromises regarding the duty cycle limits of WCS devices).

4 *See e.g.* Comments of 802.18 Radio Regulatory Technical Advisory Group (RR-TAG), ET Docket No. 02-380, filed Apr. 17, 2003, at 5-6 (discussing the potential application of dynamic frequency selection (DFS)

inaction has left innovators and manufacturers without sufficient, reliable guidance. This is not the best recipe to promote and support innovation. In addition I find it a little ironic, and a little regretful, that other regulators, notably in the EU, as well as in countries like Singapore, are poised to act in an area where we once took the lead but have not been able to act since.[5]

The reasons for moving forward are even more compelling today. Just look how far and how quickly the technology has come. 4G and 3G, Wi-Fi and Bluetooth all incorporate cognitive radio technologies and all are part of our daily lives.[6] In addition, devices can now sense the spectrum environment where they are located, thanks in part to the interest and investment of the U.S. military. Improved geo-location capabilities enable devices to communicate with data bases to transform their functionality.[7] Equally significant, companies are providing us with an even more powerful and innovative vision of the future capabilities of these technologies that is very different than what we foresaw just a few years ago.

White Spaces Technology Promises Benefits for Commercial, Municipal, and Public Safety Users.

It is important to recognize the hard work that has been done to advance the feasibility of accessing the TV white spaces while the FCC has been considering appropriate next steps. Whether developing a data base that identifies available white spaces in the TV band, lighting up a rural community or deploying useful applications, progress is being made. On the basis of just a few of the applications that I have heard about, it is clear there can be benefits. For example, one company has recently developed an on-line database to facilitate identification of TV white spaces.[8] This tool will aid deployments in rural areas, enabling residents to experience high-speed Internet connectivity without the need for costly infrastructure deployments.

Smart City. Of course, all communities can benefit from using TV white spaces to bring broadband to their citizens. For example, creative "Smart City" applications, such as meter reading and remote monitoring, offer better services and save money. While fiber networks support municipal applications, there are still challenging locations where it is impractical to lay fiber. Wireless technologies offer the answer, and when deployed in the lower frequencies of the TV bands, they offer significant propagation advantages over other wireless solutions.

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and transmit power control (TPC))(*RR-TAG Comments)*; Comments of the Wi-Fi Alliance, ET Docket No. 02-380, filed Apr. 17, 2003, at 3 (discussing DFS and suggesting the need for further study).

5 *See* Press Release, European Commission, EU Digital Dividend Proposals: European Commission Wants Airwaves Freed-Up by Move to Digital TV to Work for Swift Recovery, MEMO/09/482, published Oct. 28, 2009, available at http://europa.eu/rapid/pressReleasesAction.do?reference=MEMO/09/482, at 2 (discussing the need to utilize TV white spaces to achieve further increase in available spectrum beyond that made available by freeing-up 790-862 MHz band).

6 *See e.g.* Erik Dahlman et al., Key Features of the LTE Radio Interface, Ericsson Rev. No. 2 (2008), available at http://www.ericsson.com/ericsson/corpinfo/publications/review/2008_02/files/6_LTE.pdf, at 79 (discussing the use of uplink transmission power control in 4G Long-Term Evolution (LTE) networks).

7 *See e.g.* Microsoft Ex Parte, ET Docket No. 04-186, ET Docket No. 02-380, dated Apr. 29, 2010 (discussing TV white spaces demonstration showing protection of wireless mics using database).

8 Microsoft Research WhiteFiService, available at http://whitespaces.msresearch.us (visited Jun. 14, 2010).

Environmental Monitoring. Wilmington, North Carolina's use of wireless technology is instructive. By placing tiny wireless sensors in neighboring wetlands (which provide real-time information), the city does not have to rely on human meter readers whose infrequent visits may come too late to alert officials to environmental damage. So, for example, when spring rains or summer thunderstorms cause ecologically harmful runoff from roadways to wash into environmentally sensitive areas, wireless monitors can report changes in water quality in real time and harms can be mitigated more quickly. Wilmington has also found that it can save $800,000 per year in energy costs alone by using wireless cameras to detect movement to determine whether people are still using sports fields.

Disaster Recovery. Looking a bit further ahead, I believe the technologies driving your work in the TV white spaces offer great promise more generally. Cognitive radio technologies have significant potential in disaster relief and public safety. When a natural disaster leaves wired infrastructure devastated—and spectrum unused, relief workers need to coordinate activities and get crucial services linked back up to the outside world. Frequency agile devices that can opportunistically use spectrum and allow rapid network setup can provide first responders with better tools to establish necessary communications.

Public Safety. Public safety personnel also face an increasing need for bandwidth. Urban search and rescue workers will benefit greatly when they are able to share voice, video, and data. Wireless technologies are critical tools for these purposes, and again, white space devices deployed in the lower frequencies of the TV bands offer significant advantages over other wireless technologies in this area and can supplement capacity on fixed infrastructure networks.

While these applications are useful examples, I see dynamic spectrum access technologies, and the concepts growing out of them, as far more powerful. I believe they can be invaluable tools in our efforts to address the need for additional spectrum. As we know only too well from the digital TV transition and related proceedings, reallocations are hard. Sharing spectrum is easier. Dynamic spectrum access is even better, and may facilitate the deployment of different types of technologies in the same bands. This is something we are going to have to learn to do, and do well, in the future.

To me, appropriate and timely action to promote dynamic spectrum access technologies is not only about promoting innovation in the TV bands. It's also about providing an ample test bed that can help us address the fundamental issues of spectrum complexity. It is about encouraging additional R&D to enable engineers to facilitate more intense sharing and more dynamic management in a variety of spectrum bands. The results will be far-reaching and could even help manage the risk of interference in licensed spectrum, particularly with respect to deploying new technologies adjacent to existing services.

Three Areas in Which to Go Forward.

As I see it, we need action in at least three areas. First, we need to finalize the plans for the TV bands and provide the direction that industry needs to plan for the future. I hope we can do this in a way that does not prolong the deployment of devices in existing TV white spaces. As we move forward, we must respect the rights of all parties. We must be sensitive to the fact that manufacturers and service providers need clarity and predictability to design and deploy compelling and economically viable devices and applications.

Second, we must encourage the further development of spectrum sensing technology and establish the testing procedures for the "proof of performance" standard for such devices.[9] Spectrum sensing has the potential to help maximize our use of available spectrum and make possible applications and devices that are not feasible with the database alone.[10] As the Commission recognized in the Whitespace Order issued in 2008, sensing technologies can materially enhance the capabilities of dynamic spectrum access technologies.[11]

Finally, there is the data base.[12] We have the luxury of adopting policies that are visionary and progressive without rebuilding an existing system. We need to start with a spectrum inventory—we don't need to wait for Congress, so I hope we get started with that soon. We need an innovative, interactive and user-friendly data base that will not only serve the TV white spaces but also other spectrum bands, including government spectrum and NATO bands. Over time, I would hope the data base could draw on the intelligence of devices that can sense spectrum around them to improve the accuracy and predictability of the database itself. The database gives us the ability to ensure that white space devices respect the existing uses of license holders. In that regard, the database could one day be the enabling technology that makes development of a secondary market for spectrum a practical reality. Such a market could give license holders and industry meaningful flexibility and improve the utilization of the spectrum bands that are already allocated. We can also do a better job of sanctioning those who don't respect the data base and its related rules—but that is a topic for a different speech.

All of these steps are part of what I hope will be a comprehensive, balanced, strategic spectrum framework based on sound engineering and durable principles of good spectrum management. While we do our job to help promote innovation and efficient use of spectrum, I would also urge you to continue your engagement. There is still a continuing opportunity for industry to make the case for dynamic spectrum access technologies, and for their lasting value as tools for innovation across multiple spectrum bands.

Thank you.

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9 *Unlicensed Operation in the TV Broadcast Bands; Additional Spectrum for Unlicensed Devices Below 900 MHz and in the 3 GHz Band*, WT Docket No. 04-186, WT Docket No. 02-380, Second Report and Order and Memorandum Opinion and Order, FCC 08-260, at 89 (2008)(*Whitespace Order*).

10 *Id.*, at 27 (discussing comments laying-out various advantages of spectrum sensing techniques).

11 *Id.*, at 30 (noting that "spectrum sensing offers significant potential for use in detecting the signals of protected services" to justify its inclusion as a required means for identifying available channels).

12 *See id.*, at 20 (discussing the requirement that fixed white space devices consult a licensee database).