

Remarks of FCC Commissioner Meredith Attwell Baker

Workshop on Enhancing Access to the Radio Spectrum

National Science Foundation August 4, 2010

Thank you Dr. Marrett. It is a great pleasure to be here. I am happy to see some familiar faces and look forward to meeting new friends here today. But I must admit, it is a little daunting. At the FCC we *talk* about wireless innovation. But you are the men and women who actually *do* it. I want to thank you for your hard work and dedication. And I want to help you do more.

A little more than a month ago, the President focused our collective attention on spectrum issues. In announcing his plan to make 500 Megahertz of spectrum available for wireless broadband, the President gave each of us a unique and important challenge: rethinking the way we conceive of spectrum access to take the wireless revolution to the next level. Looking at it from the perspective of both my former job at NTIA and now at the FCC, I think finding the 500 Megahertz the President has requested will require action on several fronts. To get there, we will need spectrum reallocations, which can be costly, controversial and time consuming. We will need more traditional spectrum trading, which can be relatively straight forward. And, where neither of these is possible, we will need to develop comprehensive new approaches to dynamic spectrum access that are technologically advanced, rules-based, informed by an up-to-date, intelligent and interactive database, and powered by cognitive radios. We all have a lot of work to do together, in research and development, on the implementation of innovative policies, and frankly, on plain old confidence building.

Your meetings this week are an important step in the process. The National Science Foundation has long played an important role in helping to develop our communications infrastructure, particularly the Internet in the 1970s. NSF has been present ever since. Much of the work has involved radio spectrum and the list of NSF accomplishments in this area is long. NSF-funded innovations in circuit design and miniaturization have contributed to state-of-the art mobile wireless systems incorporating advanced energy-efficient technologies that can use radio spectrum more efficiently than anyone could have hoped just a few years ago. NSF-funded research has contributed to compression algorithms and hardware that allow us to watch spectacular images on mobile devices in challenging reception conditions. NSF-funded researchers have worked on developing the advanced transmission technologies like OFDM. These are the technologies that enable today's already fast wireless connectivity for countless devices where we work, live and study. They will be at the heart of the 4G revolution that is just around the corner.

Recognizing this great history of promoting innovation, the National Broadband Plan calls upon the National Science Foundation to answer the call yet again, and help promote broadband deployment and related issues in several areas, including cybersecurity, accessibility, technology transfers, and in an area that is of great personal interest to me: wireless research and development.

Specifically, the National Broadband Plan recommends that the NSF, in consultation with the Commission and NTIA, fund wireless research and development that will advance the science of spectrum access. Now, when I was growing up, my parents always used to tell me that it was impolite to tell other people what to do with their money, and I always try to respect that advice. However, I feel so strongly that more and better research in the area of spectrum access and use is

critical to address this country's spectrum requirements that I am going to ignore it on just this one occasion. I think additional NSF participation in the area of spectrum access is a great idea and would like to lend my support and help in any way to make it possible.

During the fifteen or so years that I have been involved with wireless issues, we have seen a dramatic decline in our country's ability to conduct the research that will be necessary to meet the challenges of more intense spectrum use. The two US companies most commonly associated with the development of the cell phone are now shadows of their former selves. Bell Labs, at the time a part of AT&T, is no longer the intellectual powerhouse it once was. Motorola, once an undisputed leader in all things wireless, struggles to find a new role in a world now defined by companies that no one had heard of twenty years ago—if they even existed. It is not clear that we have any US companies that can continue their legacy in basic research. While there are certainly impressive innovators in the wireless space, it is not apparent that even the most vibrant players today are devoting the systematic attention to basic research in wireless technologies that will be necessary to revolutionize spectrum use. Yet the need for smarter, better approaches for radio access has never been more acute. And it is clear that it is only going to get more intense for the foreseeable future.

Against this discouraging backdrop, the EARS initiative could not be more welcome. As a vehicle to fund interdisciplinary research in all science and technology issues relevant to improving the use of radio spectrum, EARS can help catalyze the critical work we need to advance our wireless economy.

With EARS, the NSF has a chance to play a real leadership role that will be of lasting value. Interdisciplinary EARS-related research can be directly responsive to many of the most important challenges that we face as we seek to use existing spectrum more efficiently and share it more effectively for both scientific and other national purposes, as well as for commercial use. Hopefully separated from the competitive forces that can at times narrow the scope of work and collaboration on wireless issues in the private sector, EARS can promote and encourage basic and applied research across a wide range of topics. The list is as long and varied as the spectrum challenge itself. The outcome promises to be significant. EARS can leverage existing activities in the areas of wireless communications and networking technologies, including not just cognitive radios but millimeter wave and terahertz technologies, nanotechnologies, energy efficiency and battery development, smart antennas and smarter receivers, interference mitigation and so much more.

While I know this is hard, I also know it can work. I am pleased to have been a part of an early initiative to promote collaboration on spectrum issues: the NTIA-FCC Spectrum Sharing Test Bed, which was implemented pursuant to an earlier Presidential recommendation to establish a pilot program to explore increased spectrum sharing between Federal and non-Federal users. The Test Bed program is not perfect. But, it *does* offer a unique opportunity for the Federal agencies to work with industry, researchers, and academia to examine new technologies that can improve management of the nation's airwaves. And, I believe it *has* provided valuable insights to inform development of spectrum policy. However, the Test Bed is only a first step. We need more of them. They need to be more accessible and function more efficiently to be timely enablers of innovation. Even improved, the Test Bed program cannot be the only vehicle we use to meet the challenges of more efficient spectrum use. That's why EARS is so important.

For my part, I will continue to encourage FCC leadership in adopting innovative spectrum policies that address the needs of all spectrum users. The Chairman has announced an ambitious agenda for spectrum policy and we have a full plate. Of particular relevance to your work, we are

slated to act on a list of additional Broadband Plan recommendations that includes opportunistic spectrum access, innovative uses of broadcast spectrum, contiguous unlicensed use, and experimental licensing. I hope we get through the whole list.

I will confess that I have two key priorities of my own. First, just as basic research is critical to the development of new technologies, I believe a spectrum inventory is a critical tool to provide the Commission, NTIA, industry—and all of you—with essential information about how, where, and when spectrum is used today. The inventory is not, however, a stand-alone policy objective. Rather, it enables stakeholders like each of you here today to make informed decisions on where to focus your efforts. And, I hope it can provide men and women like you with the basic information you need to develop a dynamic, user-friendly spectrum database, which can help facilitate and promote more efficient sharing and use of spectrum resources.

I also think we need a long-term spectrum plan. We undertook a similar exercise with regard to federal spectrum when I was at NTIA—and thank you to those here who helped make that possible—and we need to do it now on the commercial side. Without it, all of our efforts are handicapped.

Going forward, I will continue to encourage a global perspective on spectrum issues to avoid the creation of additional spectrum islands that limit the scale and reach of technologies. I will promote the allocation of significant spectrum blocks wherever possible so we can take full advantage of the new technologies you are helping to develop. And, I will promote more flexible and collaborative use of spectrum. In so doing, I hope we can be informed by your hard work and leverage your achievements to enhance consumer welfare and ensure greater spectrum utilization.

I welcome your input and collaboration in our deliberative process. Under Chairman Genachowski we are finding new and better ways to interact with our colleagues in other agencies and with the public at large. We are overhauling our web portal to make it even more useful and could easily imagine creating links to the important work you are doing here.

Close collaboration between all the interests represented at this conference will be critical. It is very encouraging to me that there are representatives here from a broad range of disciplines and branches of government. But we are going to have to learn to do more than sit in rooms together. We are going to have to make a concerted effort to take down the silos in which we operate and to take the quick and concerted actions necessary to make the rapid progress we need.

As we go forward, we are building on the broad consensus that the wireless industry is a major driver of economic growth. Nearly 270,000 men and women are directly employed in the sector and another 2.4 million jobs are directly or indirectly connected with the wireless industry. In less than a generation, we have become a country recognized for leadership in the development not only of wireless technologies, but also of devices and a whole new wireless ecosystem dominated by applications. But as you all know way better than I do, there is no such thing as a perpetual motion machine and wireless cannot continue on this dramatic growth curve without our action. Let us make the promise of next generation mobile broadband our catalyst.

I look forward to working closely with you all in the coming months as we find solutions to our nation's spectrum challenges and set the stage for the next generation of American competitiveness.