

**Remarks of Lawrence E. Strickling,  
Assistant Secretary of Commerce for Communications and Information**

**--As Prepared for Delivery--**

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I want to thank Gigi Sohn for that introduction and also to congratulate her and Public Knowledge for organizing today's conference. The management of federal spectrum is an important issue and we at NTIA welcome the engagement of Public Knowledge and you in today's audience to come together to discuss ways to maximize the efficient use of spectrum by federal users. I agree wholeheartedly with the point Harold Feld makes in one of the white papers up for discussion today—that there is value to increasing the transparency and public engagement in federal spectrum policy. Today, in addition to my appearance here, I am pleased that our two most senior spectrum officials at NTIA, Karl Nebbia and Eddie Davison, are here as well and will be speaking on the panels later this morning. I hope our participation here demonstrates our commitment to working with the public on these issues.

My task here is to set the table for the panel discussions to follow and to do so, I thought I would spend my time giving you my perspective on the current processes used at NTIA to administer the federal use of spectrum. As many of you know, NTIA is the principal advisor to the President on communications and information policy. Since I came on board a year ago, we have received a fair amount of attention for our work administering the broadband stimulus grant program and dealing with Internet governance. But NTIA has always had federal spectrum policy as a core mission and it is more important now than ever before.

I do not need to tell this audience that in the United States and around the world, we are seeing a virtual explosion of uses for wireless technologies. Mobile broadband use, in particular, has experienced growth in the United States that was unimaginable only a few short years ago. And broadband, particularly expanding access to broadband Internet, is a key element of President Obama's strategy to create durable, sustainable economic growth.

As mobile broadband use spreads and the number of applications explodes, it requires more and more radio spectrum. You know the statistics but let me review some of them for you.

The number of active mobile Internet users has doubled in the past two years to over 40 million users.

The growth rate for the adoption of mobile broadband is greater than the growth rate for DSL and cable modem services combined.

Downloading videos, participating in video conferences, and using interactive Internet applications utilize much more bandwidth than mobile voice calls, and we can expect that the projected volumes of mobile data traffic will grow exponentially in the future.

In addition, we expect a huge increase in machine-based wireless communications over the next several years, as “smart” devices take advantage of the ubiquitous connectivity afforded by high-speed, wireless data networks.

By 2014, Cisco projects wireless networks in North America will carry some 740 petabytes per month, a greater than 40-fold increase over last year.

Given this apparently insatiable demand, finding new spectrum for mobile broadband has become a key priority for policymakers. The Federal Communications Commission’s National Broadband Plan observes that the growth of wireless broadband will be constrained if government does not make spectrum available to enable network expansion and technology upgrades. This will require the reallocation of spectrum from both commercial and Federal users, and it will likely involve both the relocation of current uses as well as geographic and dynamic sharing.

The FCC’s National Broadband Plan makes several recommendations about how to meet the demand for broadband spectrum that the Obama Administration, including the NTIA, and Congress are now reviewing. Overall the National Broadband Plan calls for 500 MHz of spectrum to be made available over the next ten years. Traditionally, calls for more commercial spectrum have led to Federal agencies’ being required to relocate operations to free up spectrum for commercial users. But today, it is not so simple.

Let me give you some background on our current federal spectrum management practices to provide the context for how we will approach the current need to identify and reallocate spectrum for mobile broadband use. First, you may be surprised to learn that between 300 MHz and 3.5 GHz, only 17% of that spectrum is used exclusively by Federal entities. 32% is used exclusively by non-Federal users. The majority, some 51%, is already shared by Federal and non-Federal users.

How does sharing occur between Federal and non-Federal users? Sometimes we share spectrum to accommodate the same type of operations. For example, radar altimeters are required on many government and civilian aircraft and operate in one shared band, 4200-4400 MHz. In other cases, the Federal government provides a service to both Federal and non-Federal users. Air traffic communications originate with the FAA but Federal and non-Federal aircraft respond in a shared band. Weather satellites are controlled by NOAA but hundreds of public safety agencies, television and radio stations and universities across the country operate their own dishes to receive weather data direct from the satellites.

The other fact that I hope everyone understands is that Federal agencies do not receive licenses to use spectrum the same way commercial entities do. NTIA provides assignments of spectrum to Federal agencies upon their request but that assignment does not bestow any property rights on the agencies in the spectrum we assign them. This approach allows us to assign the same

frequency to different agencies for different uses around the country. When a Federal agency requests an assignment, every other affected Federal agency is given an opportunity to determine whether the proposed use is likely to interfere with existing uses. Yet we are able to complete assignments within nine days and of course, sooner in the case of an emergency.

This process is well-understood within the agencies but we are certainly aware of the public's interest in understanding these practices better. Congress is considering legislation to require a full spectrum inventory by both the NTIA and the FCC. Legislation passed by the House earlier this year would provide greater transparency into who is using both commercial and government spectrum and for what purpose. The House bill specifically directs that the inventory be used to identify underutilized spectrum and to recommend possible reallocations. In the Obama Administration, we support the concept of a spectrum inventory and are already taking steps to make information on current spectrum use more accessible to the public.

I do have two cautions, however. First, Federal spectrum is used to support sensitive national security and law enforcement applications that must be protected and preserved. As we work to increase transparency around Federal spectrum use, keep in mind that information regarding Federal operations actually belongs to the agencies themselves and they ultimately decide what is releasable, consistent with national security requirements. Many of them are particularly concerned about the impact that releasing specific location and frequency information may have on vital communications.

Despite these constraints, we believe that we can explain a lot about Federal use that would facilitate broader understanding and enhance policy and allocation discussions and decisions. The Commerce Spectrum Management Advisory Committee, whose members come from the business community and public interest groups, has recently completed a set of recommendations on this issue and NTIA will be reviewing them to see how we might be able to move forward to make more information available to the public, even as we wait for legislation from Congress.

My second caution is about how the public uses this information, particularly as it relates to identifying possible spectrum for reallocation. We have all heard the statements that at any given point in time, much spectrum is not in use and if we could just document that lack of use, we could make a lot of spectrum available for commercial use. The underlying assumption of those statements seems to be that unless a band is saturated with a lot of users the way land mobile radio is, the spectrum is a candidate for reallocation. That is an overly simplistic view of the world of Federal spectrum. What is often missing from those arguments is any acknowledgement of the importance of the use of a given band, even if it is sporadic. For example, law enforcement utilizes certain bands for the most sensitive covert surveillance operations. If we only looked at the amount of use of those particular frequencies, one might conclude that the spectrum could be made available for a commercial use. But the law enforcement imperative is to have this spectrum available when and where it is needed and when it is being used, law enforcement has to know there will not be any interference from other uses that might imperil the operation or the lives of the agents involved.

When we do get involved in evaluating specific bands for reallocation, it is an increasingly complex process. Many Federal systems such as radar or satellite systems have unique capabilities that cannot be met by commercial services, easily replaced with off-the-shelf equipment, or moved to other bands. This means it may not be possible to relocate these uses or would require many years and large expenditures to do so.

Even in bands that may appear to be relatively straightforward candidates for reallocation, the process may turn out to be quite involved. As many of you know, the FCC, largely at the request of industry, has suggested that NTIA evaluate the 1755-1780 band for possible pairing in an auction with the 20 MHz of AWS-3 spectrum at 2155-2175. We have concluded from our preliminary review of that band that there are too many agencies and assets involved to allow for a pairing with AWS-3 in the time frame the FCC has set for an auction.

However, as a possible alternative to match with AWS-3, we have started to take a look at the nearby 1675-1710 MHz band. Let me describe what the process is to evaluate this band—I think you will find it helpful for the discussions you will have later this morning.

At first glance, this band looks pretty straight-forward. There is one dominant user—NOAA—and two dominant uses – radiosondes (or weather balloons) and weather satellite downlinks. The weather balloons are launched twice per day and provide airborne measurement information. The satellites send raw weather data to a relatively small number of NOAA or other government sites. Therefore, this may appear to be a fairly under-used band. However, the radiosondes remain aloft for a couple of hours, reaching high altitudes and continuing to broadcast back to their base until they are a distant speck on the horizon. Meanwhile, weather centers receiving data from the satellites process that data and send it back to the satellites, from which the information can be received by public safety institutions and research centers. In fact, the information is available to anyone who buys a dish and puts it in their backyard. No license is required and no one knows how many people receive this information directly from the satellites.

Now, a key assumption in the analysis to determine if this band can be matched with AWS-3 is that there will be no relocation of these operations to another band. As a practical matter, we could not do so even if we wanted because we cannot change the radio in the satellite once it is launched into space.

So the question really is to determine whether mobile broadband could share this band with the NOAA operations. How do we answer that question? First, we need to know the number of ground stations that NOAA operates. Is that number appropriate or can operations be consolidated into fewer ground stations? For those ground stations that must continue to operate, what is the radius of the protection zone that must be defined to prevent interference to the ground station operations? As we answer those and other questions, we can build a picture of where in the U.S. this spectrum could be made available for commercial mobile broadband use, carving out those areas that must be off limits to protect the ground station operations.

But that still does not end the inquiry. I mentioned the hundreds of dishes out there that receive the weather data from the satellites. Those users would definitely be affected by a reallocation. For those users, we need to understand whether, given our modern networked world, it is

possible to supply this weather data by different means than satellite downlinks in this band. Could the weather information be distributed via the Internet or over other satellite bands? And what would it cost to do so? To deal with these issues, we will have to work with the FCC which will need to initiate a proceeding to understand who is in this band and what the alternatives might be to the satellite downlinks.

I hope you can see how the questions quickly pile up and how complicated the processes necessarily have to be to do these evaluations. I want to emphasize that while this band appears to offer some possibilities, we are still in the information gathering stage and it is premature to make any predictions as to whether in fact this band could be reallocated to allow commercial uses.

Now, as we perform an overall assessment of all Federal uses, as we would do under the spectrum inventory legislation, we have to consider the possible relocation of Federal agency uses. Where relocation of Federal agency uses is required, we have been working to improve the process for the affected agencies. For the last major spectrum auction, Congress enacted legislation that created a fund to cover the expenses of Federal agencies required to relocate to other bands. This process worked reasonably well but we have heard from Federal agencies and industry that the process could be improved for future relocations.

A major concern is the need for “start up” funds to ensure that the relocation process goes smoothly. Under the original law, funds did not become available until after a successful auction. But the Federal agencies have told us that it is important to do the best planning possible prior to the auction. This provides for a smoother, swifter and more predictable transition and more efficient use of spectrum, helping not only the incumbent Federal agency that is forced to move, but also the commercial auction winner as well. We should consider making planning and research funds available early in the relocation process, prior to the auction.

Agencies need to have adequate time for relocation determined by a realistic fact-specific assessment rather than a one-size-fits-all approach; they are interested in incentives that would encourage them to vacate spectrum expeditiously, such as allowing improved capabilities, or taking advantage of non-spectrum based solutions or commercial services in appropriate circumstances. At NTIA, we have heard these concerns and are working with Congress to make these improvements to the relocation process.

Relying solely on relocation of existing Federal and commercial users, however, will not meet the burgeoning demand for spectrum for broadband. Sharing arrangements and new technical solutions are needed so that we can stretch our finite spectrum resources. Studies have shown that some spectrum is not used continuously all the time or across all geographic locations, so finding technical and regulatory mechanisms to utilize the “open spaces” in these bands is one very promising area of innovation. These opportunities can be exploited through rules that create fixed geographic or frequency separations, but dynamic sharing solutions could go much further to create even more sharing opportunities.

In order to explore possible dynamic spectrum access solutions, NTIA’s Office of Spectrum Management, working with our spectrum measurement team at our research and engineering

laboratory, the Institute for Telecommunication Sciences (ITS) in Boulder, Colorado, has launched a Spectrum Sharing Innovation Test Bed. Using this test bed, we are evaluating the ability of geo-location and sensing devices to permit sharing of land mobile radio spectrum. NTIA is working to move this research forward by showing what dynamic spectrum access technology can and cannot do, both in the lab and in the real world. The test bed is proving to be an important opportunity for Federal agencies to work cooperatively with industry, researchers and academia to evaluate new technologies for both sensing and geo-location. In fact, in July ITS is holding a conference on spectrum sharing and I encourage everyone interested in this topic to attend.

In addition to possible technological advancements, some have suggested that the use of market mechanisms may be the best way to ensure that spectrum currently in the hands of the Federal agencies is put to its highest and best use. However, government requirements do not easily adapt to a direct market competition with commercial interests. Leasing spectrum held by government agencies on a secondary market basis is certainly theoretically possible, but it runs into issues that may make it impractical to apply. I had a chance last night to review the Public Knowledge paper for this seminar that raises an intriguing idea for creating a secondary market in bands allocated for Federal use. My first reaction, given the financial restraints we are under as Federal agencies, is to suggest that perhaps this idea could be tried out in the commercial world first. I hope the discussion today provides a good examination of these ideas.

We at NTIA look forward to being a part of the technical and policy solutions that will enable us to be as efficient as possible in the use of spectrum. We are open to new ideas, and believe that the government, the public, service providers, and equipment developers will need to work together to forge solutions – all for the national good.

I thank you again for the opportunity to speak here today. There are significant challenges ahead in order to meet expected spectrum demand created by mobile broadband devices, as well as other applications. The Obama Administration is acting to meet these challenges and we look forward to working with you in the years ahead.