

**Remarks of Lawrence E. Strickling,  
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--As prepared for delivery--

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Good morning and thank you for joining us today. NTIA is pleased to be hosting this 11<sup>th</sup> Annual International Symposium on Advanced Radio Technologies here at our research and engineering laboratory in Boulder. The agenda for this conference covers issues that are of vital importance to the national debate on spectrum and I look forward to a healthy discussion over the coming days in continuation of the collaboration between government, industry, and academia that has always marked ITS' activities.

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.

In my remarks today, I would like to discuss the actions NTIA is taking in response to the President's Executive Memorandum on spectrum and how they relate to the many legislative proposals that are under consideration right now by Congress. I will close with some specific recommendations about how legislation might be shaped to maximize the benefits to the American people of these initiatives.

With other audiences I would generally spend some time talking about the importance of spectrum to America's economic growth and the urgent need to make the most use of this limited resource while protecting vital federal operations. I do not think that this is necessary with this audience as everyone at this conference knows that as mobile broadband use spreads and the number of applications explodes, it requires more and more radio spectrum. So I'll skip the statistics for today.

What I will say is that finding new spectrum for mobile broadband has become a key priority for policymakers, including President Obama. Last month, the president released an executive memorandum directing NTIA and other Federal agencies to take actions to increase the amount of federal and commercial spectrum available for mobile broadband and other applications.

The key components of the president's memorandum are the following:

First, the President directs NTIA to collaborate with the FCC to make available an additional 500 MHz of spectrum over the next ten years suitable for mobile and fixed broadband use. By

October 1, we will complete a plan and timetable for identifying and making this spectrum available.

Second, this plan is to incorporate new tools and new incentives for federal agencies to ensure the timely and effective reallocation of spectrum. OMB has the responsibility to develop these tools for the plan.

Third, the President directs NTIA, working with NIST, the National Science Foundation and other agencies, to create and implement a plan to explore innovative spectrum-sharing technologies.

As the manager of all federal government spectrum usage, NTIA welcomes the President's challenge and we are hard at work collaborating with the FCC and with the Federal agencies on this effort.

Traditionally, calls for more 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. Meeting the goals of the president's memorandum will require the reallocation of spectrum from both commercial and Federal users. Moreover, and most pertinent to this conference, many of the bands that will be considered in this effort will involve sharing of some sort.

Currently, of the spectrum between 300 MHz and 3.5 GHz, only 17% of it is used exclusively by Federal entities. Another 32% is used exclusively by non-Federal users while the majority, some 51%, is already shared by Federal and non-Federal users. This sharing can take several forms.

First, the Federal agencies already share spectrum with each other through NTIA's coordination of frequency use. In order to facilitate sharing among the agencies and to promote spectrum efficiency, 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. 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 9 days and of course, sooner in the case of an emergency.

Second, Federal agencies share spectrum with non-Federal entities, in some cases 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. For example, air traffic communications originate with the FAA but Federal and non-Federal aircraft respond in a shared band.

The fact that there is this level of sharing, both among Federal agencies and between Federal agencies and non-Federal entities, has important implications for us as we perform our tasks under the Executive Memorandum.

First, we are certainly aware of the public's interest in understanding better how spectrum is assigned today. Congress is considering legislation to require a full spectrum inventory by both the NTIA and the FCC to provide greater transparency into who is using both commercial and government spectrum and for what purpose. It is specifically assumed in the bills that the availability of this inventory will assist in the identification of spectrum to be reallocated to commercial use. Indeed, 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. But I do have two cautions. 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 many uses by Federal agencies are vital to our national security and law enforcement and that the agencies 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. Still our staff has begun the effort of translating the government master file data into understandable information that can be made publicly available. If we are to be successful in developing interactive approaches, we will need to come up with mechanisms that allow interaction with our data while still protecting the data from release.

Second, I must urge caution 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, significant amounts of spectrum are 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 commercial wireless-mobile radio is, the spectrum is a candidate for reallocation. That is an overly simplistic and incorrect view of the world of Federal spectrum. What is often missing from those arguments is any acknowledgement of the importance of the use and the need of the Federal agency to have 24/7 availability of a given band, even if it is used sporadically.

To cite just one 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, this band remains very much on the table for our longer term review effort.

As a possible alternative band to match with AWS-3, we are looking at the nearby 1675-1710 MHz band. Today, this is a shared band. There is one dominant user in this band—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, while 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 up to 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, which then broadcast it across the country to hundreds of unlicensed and unregistered satellite dishes at TV and radio stations, universities and public safety centers. So how do we analyze this band to determine if commercial mobile broadband services could fit in here?

The traditional idea of clearing the band of these existing uses is a non-starter here. As a practical matter, we could not relocate the weather satellite operations even if we wanted because we cannot change the radio in the satellite once it is launched into space. So, could we limit the number of earth stations communicating with the satellites to free up large swaths of the country to use the spectrum for mobile broadband? But then you have the issue of the hundreds of unregistered and unlicensed dish owners that depend on receiving the weather data on a downlink from the satellites. How do we assess their equities? One option, given our modern networked world, is to investigate whether the data could be supplied via a terrestrial links to these entities, such as through the Internet. What would it cost to change the distribution method? And if we do modify the Federal agency operations in this band, by relocating earth stations or otherwise, where does the money come from to pay for the expenses of those modifications?

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.

This example points out the importance of the issues you are discussing here for the next few days. It should be obvious that exploring, testing and implementing new methods of sharing spectrum are critical to meeting the 500 MHz goal. President Obama's executive memorandum recognizes this and specifically calls for a "plan to facilitate research, development, experimentation, and testing by researchers to explore innovative spectrum-sharing technologies, including those that are secure and resilient."

Where spectrum is not used continuously all the time or across all geographic locations, and does not involve critical national security and law enforcement interests, it will be important to find technical and regulatory mechanisms to utilize the "open spaces" in these bands. 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 accommodate all the new uses, whether it is commercial broadband, greater numbers of Unmanned Aerial Vehicles or development of the smart grid, we are going to have to find ways to get more out of the spectrum. This may involve new antenna techniques, smaller cells or cognitive and dynamic access methods.

NTIA is fully committed to these efforts. In order to keep federal agencies informed about developments in these technologies, NTIA's Office of Spectrum Management has created a Dynamic Spectrum Access Coordination Group. Also, our spectrum management staff, working with the spectrum measurement team here at ITS, has launched a Spectrum Sharing Innovation Test Bed. NTIA is using this test bed to evaluate 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. The work of testing these technologies is complex and it is critical that the effort yields results to which all parties will be able to agree.

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.

All of this work has implications for the legislative effort that is underway on Capitol Hill. I have already talked briefly about the spectrum inventory legislation but would like to address the relocation bills that are also under consideration. The Commercial Spectrum Enhancement Act, passed in 2004, provided compensation from auction proceeds for Federal agencies for their costs of relocation. We support the fact that new legislation is needed but urge the Congress to take a more comprehensive approach to these issues than what is reflected in the current draft bills.

First and foremost, as should be apparent from my remarks, we are going to be dealing with reallocation of spectrum, which is a broader concept than just relocation. As such, any legislation should allow reimbursement of the costs that agencies incur to allow sharing, even if

the agencies do not relocate their current operations. For example, in the case of the weather satellite band I discussed earlier, if NOAA could find a method to deliver weather data to all those unregistered users, the legislation should be broad enough to cover the costs of implementing such a solution.

Second, agencies need to have access to planning and research funds to plan for reallocation before the auction or reassignment, not just after. And the agencies should be allowed to plan for and receive an upgrade of technology if they are actually relocating operations to a new band. The current draft bills propose to create complicated enforcement processes to deal with agencies that miss relocation deadlines but these two provisions would greatly improve the ability of agencies to more accurately forecast and commit to a date for relocation and create an incentive to move quickly to take advantage of new technology. We hope that as Congress continues to consider spectrum legislation it will include these proposals to improve the draft bills currently under debate.

I thank you again for attending this conference. 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.